



# DEVELOPMENT APPLICATION: COMMUNITY PURPOSE FACILITY & PLACE OF WORSHIP

Lot 128 Robertson Road, Byford



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PLANNING & SURVEY SOLUTIONS



## DOCUMENT CONTROL

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# 1 INTRODUCTION

## 1.1 Purpose

This report has been prepared by Harley Dykstra in support of an application for the development of the Proposed Community Purpose Facility & Place of Worship (herein referred to as the 'subject site').

A Copy of the development plans is attached at **Appendix A**.

This report includes the details of the proposed development and subject site, and a planning assessment addressing all relevant statutory compliance, policy requirements and planning considerations.

## 1.2 Background

In accordance with the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2 (TPS 2), the subject site has been zoned 'Urban Development' which has the function of providing appropriate retail, service commercial, and community facilities to service the needs of the residents of the Urban Development Zone.

The site is further zoned 'Mixed Business' under the Local Structure Plan Lots 1, 3 & 128 South Western Highway Byford 2014, which has the purpose of providing "for a range of light and service industrial, wholesaling, showrooms, trade and professional services which are not generally appropriate to or cannot conveniently or economically be accommodated within centre zones or industrial zones."

The Shire has also recently endorsed its DRAFT Local Planning Scheme No. 3 (LPS 3), which zones the subject site 'Service Commercial' to "accommodate commercial activities which because of the nature of the business, require good vehicular access and/or large sites."

### 1.2.1 Site Subdivision History

The development of the subject site has been implemented systematically with several subdivision and Development Applications being determined in parallel to past Development Applications. The subdivision history of the site is demonstrated in **Table 1** below:

WAPC APPLICATION:	DETAILS:	STATUS:	DATE OF DETERMINATION:
157084	Create road widening of South Western Highway and extension of Robertson Road to secure new intersection.	Approved	16 November 2018
159209	Create Lot 1 for National Storage development site.	Approved	3 August 2020
160458	Create 3 industrial lots for Stage 2 development and in addition to the Stage 1 National Storage development, which is under construction.	Approved	11 June 2021
2022-223990	Create an amalgamated Freehold Lot 1 from Lots 1-3, created in previous subdivision approvals, and subdivide into three Survey Strata Lots and Common Property. The Common Property lot accommodates private sewerage infrastructure through a Secondary Treatment System (ATU), as	Approved	17 May 2022



approved by Department of Health on 25  
January 2022.

**Table 1 Site Subdivision History**

### 1.2.2 Site Development History

Development of the subject site has occurred in various stages with the following uses identified in **Table 2** below having been previously approved for the subject site:

STRATA LOT NUMBER:	USE APPROVED:	DETAILS:	DATE OF DETERMINATION:
Strata Lot 1	Warehouse (Self-Storage)	The development comprises a 2-storey warehouse in two buildings, an L-shape and island buildings, serviced by a secure driveway and parking lanes on the northern portion of Lot 128. The site is known as Lot 1 on Lot 128 South Western Highway.	18 May 2020
Strata Lot 2	Vehicle Repair/Warehouse /Showroom	On Lot 2, the 1,349m <sup>2</sup> building footprint for the automotive repair comprised of 897m <sup>2</sup> Vehicle Repair (panel beater and paint repairs), 452m <sup>2</sup> Warehouse, 56m <sup>2</sup> Office and 92m <sup>2</sup> of staff and storage areas. It accommodated 41 parking bays, including a disabled bay, and 4 bicycle racks (8 bicycles).	19 July 2021
Strata Lot 3	Light Industrial/Light Industry/Showroom	Lot 3 was approved as a mix of Light Industrial (458m <sup>2</sup> total floor area), Light Industry (667m <sup>2</sup> total floor area) and Showrooms (579m <sup>2</sup> total floor area). The site planning allowed for 32 public parking bays, including a disabled bay, and 4 bicycle racks.	19 July 2021

**Table 2 Site Development History**

The proposed development is to be located on the remaining portion of Lot 128 to the south of the three (3) strata lots, once these have been created.



## 2 LAND DESCRIPTION

### 2.1 Land Ownership Details

The details of the subject property are identified as follows in **Table 3**:

LOT	DEPOSITED PLAN	VOLUME/FOLIO	LOT AREA	REGISTERED PROPRIETOR
128	156237	258/190A	3.76134	Byford Project 2018 Pty Ltd

**Table 3** Certificate of Title details

A copy of the current Certificate of Title is included at **Appendix B**.

### 2.2 Location and Context

The subject site is located within the suburb of Byford and is situated approximately 43 kilometres south of the Perth Central Business District (CBD), 2 kilometres south of the Byford Town Centre, and lies adjacent to the western boundary of the South-Western Highway. The site is bounded to the north, west and south by Robertson road, and to the east by the South-Western Highway.

Development in Byford is largely comprised of medium and low-density residential lots in proximity to the Town Centre, with larger rural and rural/residential lots becoming more prevalent away from the town centre.

The Byford Town Centre currently enjoys a supermarket, speciality shops, a tavern, health services, fast food outlets and a private recreation facility. A small service commercial node is currently being developed on the northern portion of the subject site, including a National Storage, and the Automasters vehicle repair shop recently approved.

### 2.3 Site Description

Other than the newly developed National Storage facility and upcoming Automasters, the remainder of the subject site is currently vacant and has been largely cleared of any significant vegetation in preparation of development. The site is generally flat with an AHD of 59m at the south-west corner, before sloping gently downwards across the site to an AHD of 56m at the north-eastern corner.

In addition to the above, an Aerial Locality Plan is provided below at **Figure 1**, depicting the site in its context to nearby, surrounding development, while an aerial photograph has been included at **Figure 2**.



Figure 1 Aerial Locality Plan



Figure 2 Aerial Photograph





### 3 PROPOSED DEVELOPMENT

The proposed development will comprise two land uses accommodated in the remaining portion of Lot 128. In summary the proposal includes the following:

- \* Community Purpose Facility;
- \* Place of Worship.

In addition to the above, a total of 50 parking bays and significant landscaping areas have been proposed for the subject site. The following sections provide details of each use and a full set of development plans including site plans and elevations have been attached at **Appendix A**, as prepared by Phillip Hanham.

#### 3.1 Overview

The proposed community purpose facility will be located at the south-western corner of the subject site with its building orientation facing west towards the primary street. The facility will include a 300-seat capacity auditorium of 540m<sup>2</sup>; three (3) multipurpose kid's rooms of 120m<sup>2</sup>, 64m<sup>2</sup> and 36m<sup>2</sup> respectively; a parent's room of 18m<sup>2</sup>; foyer of 126m<sup>2</sup>, a tea preparation area of 40m<sup>2</sup> and various amenities including toilets, storerooms, and child's playground area.

##### 3.1.1 Community Purpose Facility

The proposed community purpose facility will be available to be leased by the general public for a variety of potential uses that could include graduations, dance groups, special needs groups, club events etc. While one long-term lessee is intended (detailed below), the applicant wishes the facility to remain available for lease outside of this agreement for the benefit of the local community, including not-for-profit groups.

##### 3.1.2 Place of Worship

The proposed community purpose facility will also be available for the use of Centrepont Church to conduct their services and community programs. Services and programs to be run by the not-for-profit organization will include a Sunday morning service (current attendance of approximately 150 people with a proposed future capacity of 300); a weekly youth program of approximately 30 people; and a fortnightly mothers program of approximately 25 people (mothers and babies).

##### 3.1.3 Operational Details and Staffing

The proposed hours that the facility would be for the explicit use of the Centrepont Church are as follows:

###### OPERATING HOURS:

Thurs 10am till noon (fortnightly)  
 Fri 6:30pm till 8:30pm  
 Sun 9am till noon

The proposed hours that the facility would be available for hire by other parties are as follows:

###### OPERATING HOURS:

Mon 6am till 12am  
 Tue 6am till 12am  
 Wed 6am till 12am  
 Thurs 6am till 12am (excluding fortnightly 10am-12pm youth program slot)  
 Fri 6am till 6pm & 9pm till 12am



Sat 6am till 12am  
Sun noon till 10pm

However, due to the intended use of a reciprocal parking agreement with the adjacently approved use to the north, the venue hire will need to restrict its maximum occupancy during overlapping operational hours.

Although not yet developed, the expected operational hours for the approved adjacent use on the basis of existing stores in nearby locations are as follows:

Mon 7:30am till 5pm  
Tue 7:30am till 5pm  
Wed 7:30am till 5pm  
Thurs 7:30am till 5pm  
Fri 7:30am till 5pm  
Sat 8am till 12pm  
Sun *Closed*

As a result, any venue hires to occur within the above-mentioned hours will need to be limited to a maximum occupancy as can be accommodated for by the proposed parking allocation for this development of 50 bays. A detailed parking calculation providing further information is provided in section 5.1.2. below.

Staffing for the proposed community purpose facility will fluctuate in relation to its use, however, a maximum of 4 staff are envisioned to be required to accommodate for peak occupancy, which would occur on Sundays during the regular church services conducted by Centrepont Church.

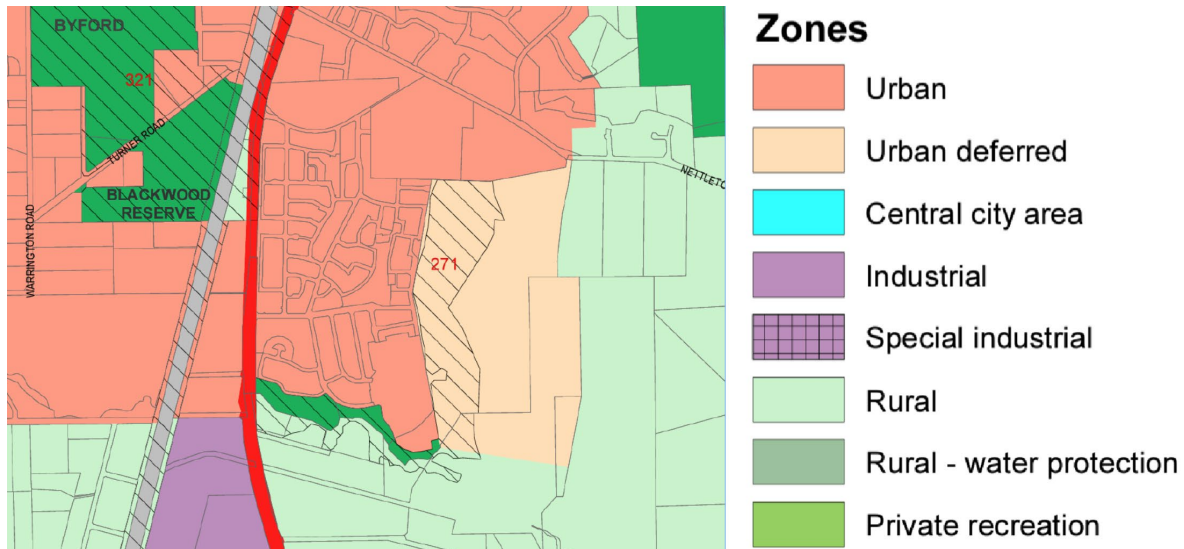
Minimal staff are envisioned for all other potential uses that could occur on the site as the leasing of the venue will be managed from the applicants' administration building at another location.



## 4 STATE PLANNING FRAMEWORK & RATIONALE

### 4.1 Metropolitan Region Scheme

The subject land is primarily zoned 'Urban' under the Metropolitan Region Scheme (MRS) and adjoins other properties also zoned 'Urban'. The purpose of the Urban zone is to accommodate a range of uses, including commercial development, as proposed by this application and depicted in **Figure 3** below.



**Figure 3 Metropolitan Region Scheme Map**

### 4.2 State Planning Policy 3.7 – Planning for Bushfire Prone Areas

The Western Australian Planning Commission's State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) and accompanying Guidelines for Planning in Bushfire Prone Areas sets out specific guidelines and requirements for development in order to preserve life and reduce the impact of bushfire on property and infrastructure. In accordance with SPP 3.7 a Bushfire Management Plan (BMP) has been prepared for the proposed development, detailed further in section 6.3 below.

### 4.3 State Planning Policy 5.4 - Road and Rail Noise

State Planning Policy 5.4 (SPP5.4) provides guidance on how proponents and decisions can minimise the impact of road and rail noise on noise-sensitive land uses. This policy seeks to ultimately ensure that communities are protected from transport noise and that a reasonable level of amenity adjoining regional transport corridors is maintained.

Given the extent of potential noise sources in proximity to the site, a Noise Impact Assessment (NIA) prepared by an acoustic engineer will be required to understand the specific noise levels and to outline measures concerning how the proposed development can mitigate the impact of these noise sources. In accordance with SPP 5.4, a NIA has been prepared for the proposed development, further details are provided in section 6.2 below.

### 4.4 State Planning Policy 7.0: Design of the Built Environment

State Planning Policy 7.0 Design of the Built Environment (SPP 7.0) was enacted by the WAPC on 24 May 2019 and intends to provide a framework for improving the built form outcomes by introducing design review and assessment processes.



To achieve compliance with SPP 7.0, the following design statement has been provided in **Table 4** below demonstrating the manner in which the proposal has addressed each of the principles:

DESIGN PRINCIPLES	DESIGN STATEMENT
<p><b>1. Context &amp; Character</b></p> <p><i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i></p>	<p>This development proposes a colour and material palette that will respond to the built form elements of the local area and contribute to a sense of place. In particular, the building places a significant focus on providing a connection to the historic character of the locality through architectural features such as the use of weathered timber cladding, eco wamberal stone and public art promoting a 'rural aesthetic'. In addition, the development seeks to provide a connection to and enhance the natural amenity of the locality by providing a significant amount of landscaping including along the boundaries of the site and within setback areas.</p>
<p><b>2. Landscape Quality</b></p> <p><i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i></p>	<p>The proposed development, while being set in an urban environment, recognises the responsibility to provide a connection to the natural environment (the extensive tree canopy in both the public and private realms). As such, in areas available for landscaping, significant landscaping treatments have been proposed in order to provide a connection to the natural environment and amenity of the locality.</p>
<p><b>3. Built Form and Scale</b></p> <p><i>Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.</i></p>	<p>The development responds to its surrounding environment by complementing the setbacks, heights, and mass of developments in the locality. The scale of the building will enable appropriate landscaping treatments, outdoor leisure areas and appropriate building setbacks to be provided.</p> <p>In particular, this development has mirrored the adjacent developments to the north of the site in relation to building orientation, setbacks and scale to ensure that it reflects the existing character while still transitioning away from the industrial feel through the use of colour, articulation and sensitive materials.</p>
<p><b>4. Functionality &amp; Build Quality</b></p> <p><i>Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life cycle.</i></p>	<p>The proposed development has been designed to efficiently provide for the needs of a diverse range of occupants including the elderly, disabled, parents, young children etc. Additionally, accessways, ramps and facilities have been provided as per AS 2890 and pathways have been provided throughout the site to ensure strong legibility to outdoor spaces and functional indoor spaces.</p>
<p><b>5. Sustainability</b></p> <p><i>Good design optimises the sustainability of the built environment, delivering positive</i></p>	<p>The design of the building includes eaves and pergolas offering additional shade to the building and reducing the developments reliance on mechanical cooling. Additionally, the proposed development intends to capitalise on solar access where possible</p>



<i>environmental, social, and economic outcomes.</i>	through the use of large glass panels to allow for maximum natural sunlight and ventilation. Water-sensitive urban design elements have also been proposed for the significant landscaping areas to ensure that irrigation can be managed in a sustainable manner that reduces water-wastage and pollution from runoff.
<b>6. Amenity</b> <i>Good design provides successful places that offer a variety of uses and activities, while optimising internal and external amenity for occupants, visitors, and neighbours, providing environments that are comfortable, productive, and healthy.</i>	The nature of the proposed development being community-purpose hire means that the opportunity for a variety of uses and activities are being provided for the local community. Good internal amenity has been provided via high ceilings to ensure that areas are spacious and comfortable, a foyer area for community socialisation, kitchen area for the preparation of tea/snacks and various other amenities including facilities, staff office, parents room etc. A children's' playground area, canopied portico and open parkland area including proposed trees and public seating further enhances the level of amenity proposed.
<b>7. Legibility</b> <i>Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.</i>	The building is orientated toward Robertson Road and provides vehicular access from Robertson Road directly to the proposed carpark area. Strong connection is provided throughout the development by a pedestrian pathway proposed to connect the development with the carpark area, open parkland, and pedestrian linkages along Robertson Road. Signs and wayfinding elements are also proposed throughout the carpark area to ensure all entrances/exits are easily identifiable.
<b>8. Safety</b> <i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i>	The development provides for a high level of passive surveillance within the site through the use of glazed panels and outdoor areas. In addition, the nature of the land use itself will attract a relatively high level of activity. This will reduce opportunities for anti-social behaviour within the site and adjoining road reserve, as well as for surrounding residences.
<b>9. Community</b> <i>Good design responds to local community needs, as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.</i>	The proposed community purpose centre is anticipated to provide a much-needed social service to the area. The patrons of the centre are likely to be broad and diverse which will facilitate social interaction for the local community. The building's setting in a significant amount of landscaping will also enhance the pedestrian experience of pedestrians along Robertson Road.
<b>10. Aesthetics</b> <i>Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.</i>	Significant effort has been put into the design to ensure that it is contextually appropriate and responds to the existing and future character of the area. In particular, the proposed materials and artwork will provide a connection to the historic amenity of the locality. Additionally, the building will act as a transitional point between the industrial uses to the north, and intended service commercial uses to the south through the nature of its bulk and scale in conjunction with the proposed use of material and colour.

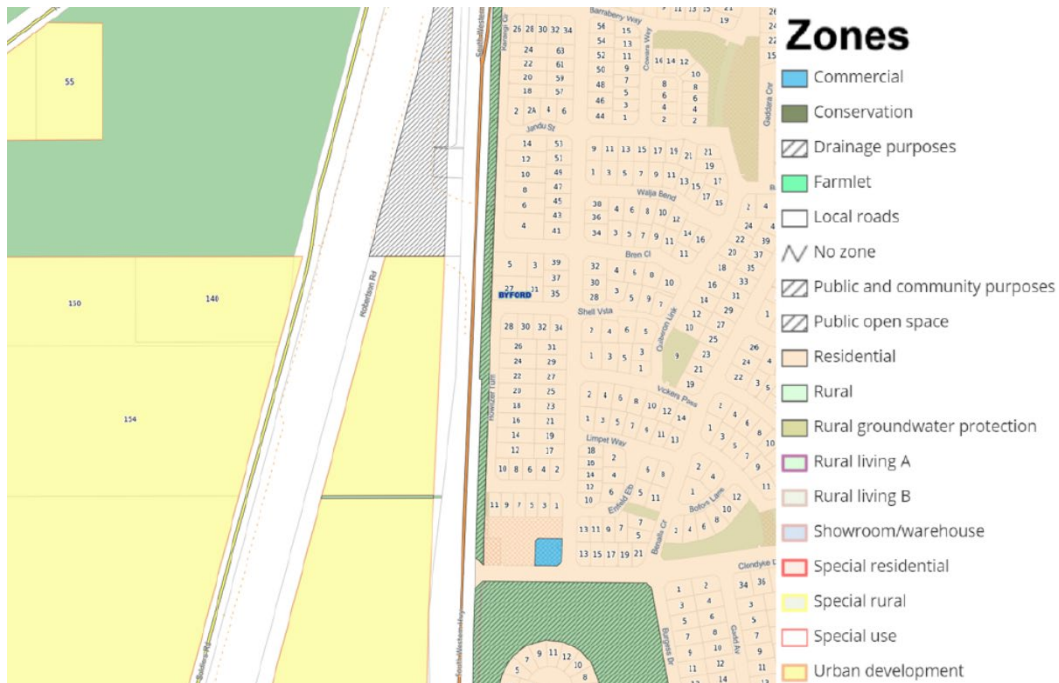
**Table 4 Response to SPP 7.0 Design Principles**



## 5 LOCAL PLANNING FRAMEWORK & RATIONALE

### 5.1 Town Planning Scheme No. 2

The subject site is zoned “Urban Development” under the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2 (TPS 2), as depicted in **Figure 4** below.



**Figure 4 Town Planning Scheme No. 2 Map**

In accordance with the requirements for the Urban Development zone, a Local Structure Plan (LSP) is required to further designate the zoning and development requirements for the area. The LSP for *Lots 1, 3, 128 South Western Highway, Byford* designates the “Urban Development” zone for “Mixed Business”, which has the function of “providing for a range of light and service industrial, showrooms, trade and professional services which, by reason of their scale, character and operational land requirements, cannot conveniently or economically be accommodated within centre zones or industrial zones”.

#### 5.1.1 Land Use Permissibility

In accordance with TPS 2 and LSP, there are no specific development standards included for the “Urban Development” or “Mixed Business” zones. However, the LSP contains provisions for a vibrant and active Mixed Business Centre that compliments the Byford Town Centre without undermining its core functions for retail and shopping needs.

The proposed uses have been cross-referenced against the Zoning Table contained in Table 1 of the Shire’s TPS 2 and summarized in **Table 5** below:

TYPE OF USE	TPS 2 DEFINITION
Community Facility	Use Not Listed
Church	Place of Public Worship

**Table 5 Land use definitions in accordance with TPS 2**



The following provides a summary of the land uses in the context of the land use definitions prescribed by TPS 2:

### Community Facility

The proposed community purpose facility is considered not to reasonably fit the definition of any of the categories include in Table 2, as such in accordance TPS 2:

3.2.5 *“If the use of land for a particular purpose is not specifically mentioned in the zoning table and cannot reasonably be determined as falling within the interpretation of one of the use categories the Council may:*

*a) determine that the use is not consistent with the objectives and purpose of the particular zone and is therefore not permitted; or*

*b) determine that the proposed use may be consistent with the objectives and purpose of the zone and thereafter follow the advertising procedures of Clause 64 of the Deemed Provisions in considering an application for planning consent.*

The Community Purpose use is considered to be consistent with the function of the “Mixed Business” zone as its scale, character, and operational land requirements such the requirement for large parking areas mean that it cannot be conveniently or economically accommodated within centre or industrial zones.

### Church

The proposed church is considered to best fit the definition of “Place of Public Worship” as defined within TPS 2:

*“means land and buildings used for the religious activities of a church but does not include an institution for primary, secondary, or higher education, or a residential institution.*

Place of Public Worship is classified as an “AA” use within the “Mixed Business” zone, ensuring the Council may, at its discretion, permit the use.

### *5.1.2 Vehicle Parking Requirements*

Vehicle parking requirements are defined within Part 7 of TPS No. 2 where it provides parking bay rates according to land use within a table and requires that parking requirements for all other uses not listed within that table, to be determined by Council. In that instance Council must have regard for the nature of the development and the number of employees likely to be on the site amongst others.

On the basis of the above, and Part 7 of the Scheme, the following parking calculation is provided. in **Table 6**.

TYPE OF USE	TPS 2 REQUIREMENT	PARKING REQUIRED
Community Purpose	Use Not Listed *	75 bays
Place of Public Worship	1 space per 4 persons accommodated	75 bays
	<b>Total:</b>	<b>150 bays</b>

**Table 6 TPS 2 Parking Requirements**



\* Although no parking standard is included for Community Purpose within TPS 2, it was considered acceptable to adopt the same parking standard as for Public Place of Worship due to the similarities in parking requirements between the two uses.

However, as the Shire’s DRAFT LPS 3 contains the preferred land use definitions and parking calculations for the future strategic direction of the locality, the proposed provision of parking has been calculated in accordance with the DRAFT scheme and is detailed further in the following sections.

### 5.2 DRAFT Local Planning Scheme No. 3

The DRAFT Local Planning Scheme No. 3 (LPS 3), currently under review by the WAPC, will supersede the Shire’s current scheme (TPS 2) upon endorsement from the commission. In accordance with LPS 3, the subject site is zoned “Service Commercial” which has the function of accommodating commercial activities for uses which require good vehicular access and/or large sites, such as showrooms, wholesale sales and services, as depicted in **Figure 5** below.

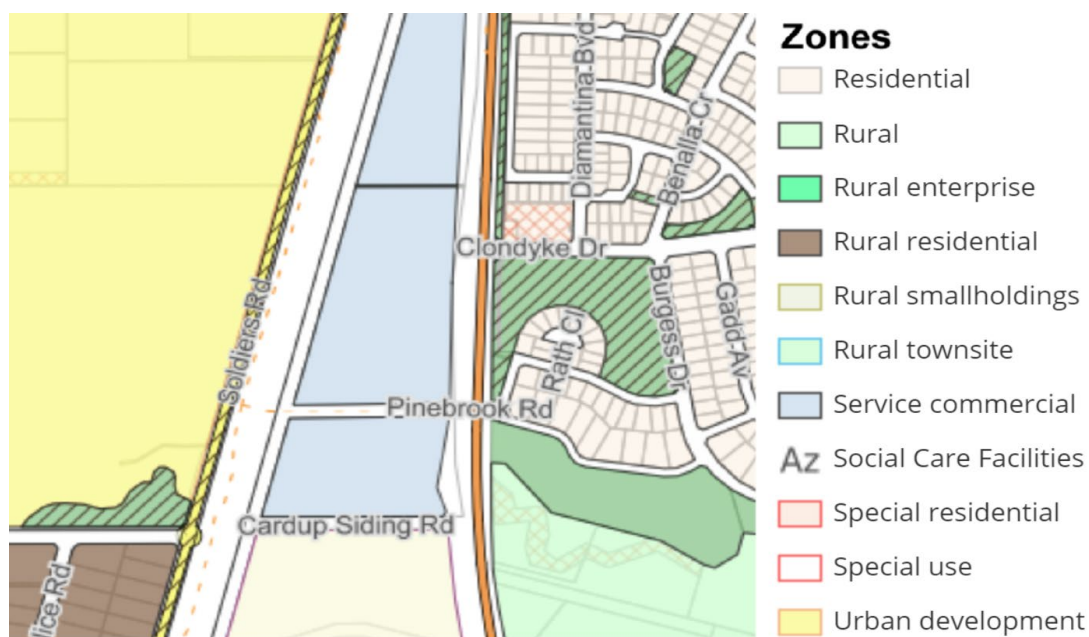


Figure 5 DRAFT LPS 3 Scheme Map

As the proposed Community Purpose facility will require good vehicular access and a significant amount of area for carparking, it is considered to be an appropriate use within the Service Commercial zone in accordance with LPS 3.

#### 5.2.1 Land Use Permissibility

The proposed uses have been cross-referenced against the Zoning Table contained in Table 3 of the Shire’s DRAFT LPS 3. **Table 7** summarises the land use definitions that pertain to this proposal:

TYPE OF USE	LPS 3 DEFINITION
Community Facility	Community Purpose
Church	Place of Worship

Table 7 Land use definitions in accordance with DRAFT LPS 3





The following provides a summary of the land uses in the context of the land use definitions prescribed by LPS 3:

#### Community Facility

The proposed community facility is considered to best fit the definition of “Community Purpose” as defined within LPS 3:

*“means premises designed or adapted primarily for the provision of educational, social or recreational facilities or services by organisations involved in activities for community benefit.”*

Community Purpose is classified as a “D” use within the “Service Commercial” zone, ensuring the use is not permitted unless the local government has exercised its discretion by granting development approval;

#### Church

The proposed church is considered to best fit the definition of “Place of Worship” as defined within LPS 3:

*“means premises used for religious activities such as a chapel, church, mosque, synagogue or temple.”*

Place of Worship is classified as an “A” use within the “Service Commercial” zone, ensuring the use is not permitted unless the local government has exercised its discretion by granting development approval after giving notice in accordance with Clause 64 of the Deemed Provisions.

In relation to the uses proposed as part of this application and the advanced nature of the Shire’s DRAFT scheme, it is considered that the definitions contained in the DRAFT LPS 3 are more relevant depictions than those contained within the current TPS 2.

#### *5.2.2 Parking Requirements*

Vehicle parking requirements are defined within section 4.3 of LPS No. 3 where it provides parking bay rates for a number of land uses within a table and requires that parking requirements for all other land uses, not listed within that table, to be determined by Council. In that instance Council must have regard for the nature of the development and the number of employees likely to be on the site amongst others.

On the basis of the above, and section 4.3 of the Scheme, the required parking allocation for the proposed development is provided in **Table 8** below:

TYPE OF USE	LPS 3 REQUIREMENT	PARKING REQUIRED
Community Purpose	1 bay for every 4 persons accommodated at maximum occupancy and 1 bay per employee	79 bays
Place of Worship	1 bay per 4 persons accommodated at maximum occupancy	75 bays

**Table 8 DRAFT LPS 3 Parking Requirements**

Given the proposed uses for this development will only operate at separate times to each other, it is considered acceptable that the parking requirement for the proposed use should be based solely on the Community Purpose use, as this has the greater requirement.

Therefore, a total of fifty (50) vehicle parking bays have been included in this proposal including four (4) for the use of staff and one universally accessible bay, as demonstrated in **Table 9** below:



TYPE OF USE	PARKING PROVIDED
Community Facility/Place of Worship	50 bays (including 4 staff & 1 universally accessible)

**Table 9 Total Parking Proposed**

This provision is intended to be supplemented through a reciprocal parking agreement with nearby development located adjacent to the north. This is in accordance with section 36 of the DRAFT LPS 3, which makes provisions for the local government to reduce or combine the parking requirements when there are two or more uses on the same lot providing suitable reciprocal parking arrangements can be demonstrated. As a result, the proposed development will enter into a reciprocal parking agreement with the adjacently approved use, given these uses operate at different times.

However, during the likely operating hours of the approved vehicle repair shop, the maximum occupancy for any proposed venue hire will need to be restricted to prevent any overlap of use in the adjacent carparking area.

Therefore, any venue hire proposed within the operating hours of the adjacent vehicle repair shop will be restricted to the following numbers included in **Table 10** in accordance with the DRAFT LPS 3 parking requirements:

PARKING PROVIDED	LPS 3 REQUIREMENT	RESTRICTED OCCUPANCY
50 bays (including 4 staff & 1 universally accessible)	1 bay for every 4 persons accommodated at maximum occupancy and 1 bay per employee	184 persons and 4 staff

**Table 10 Restricted occupancy for operational overlap between adjacent uses**

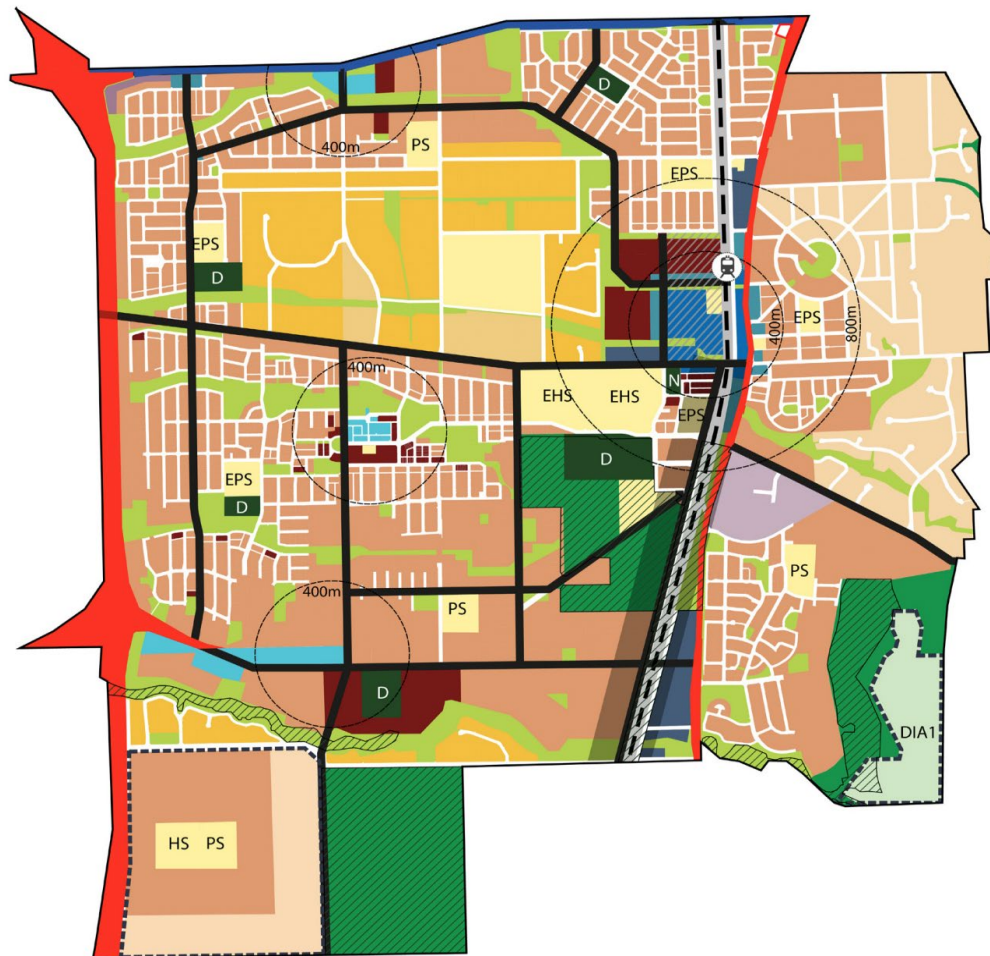
This will ensure that there will be no negative impact on the availability for parking for the approved adjacent use.

### 5.3 Byford District Structure Plan

The Byford District Structure Plan was prepared in 2005 to help coordinate the future development of the Byford town and district centres, and recently updated in 2021 to align with the provisions in DRAFT LPS 3. The plan offers the following objectives relevant to the subject site:

- Designates Lot 128 for Service Commercial;
- Consolidates the Local Structure Plan for Lots 1, 3 & 128 South Western Highway, Byford.

The Byford District Structure Plan Map has been included in **Figure 6** below for reference.



**Figure 6 Byford District Structure Plan Map**

#### 5.4 Lots 1, 3 & 128 South Western Highway, Byford Local Structure Plan

The Lots 1, 3 & 128 South Western Highway, Byford Local Structure Plan (LSP) was adopted by the WAPC in 2005 to provide a neighbourhood structure to inform development in the Byford area.

The plan identifies the site for “Mixed Business” but does not contain any specific development standards for the zone, instead requiring compliance with the Shire’s Local Planning Policy No. 19 Byford Development Requirements (LPP 19) which has since been rescinded. In its place, development will be determined in accordance with the applicable zoning, planning scheme provisions of the TPS 2 & DRAFT LPS 3, and where applicable, any approved Local Planning Policies (LPP).

The LSP is depicted in **Figure 7** below for reference.

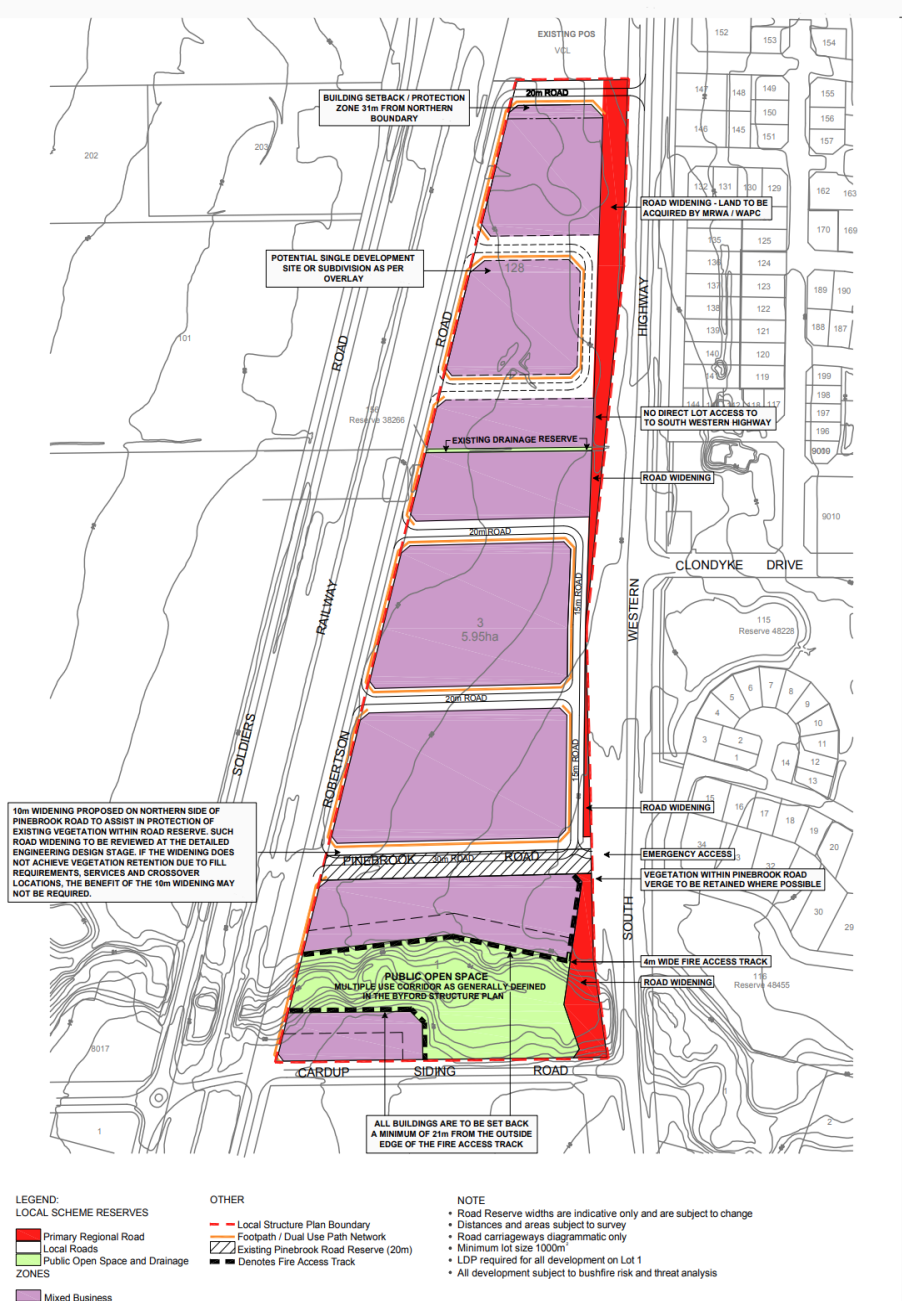


Figure 7 Lots 1, 3 & 128 South Western Highway, Byford LSP

### 5.5 Local Planning Policy 1.6 - Public Art

In accordance with Local Planning Policy 1.6 (LPP 1.6), development with a value between \$1 million and \$50 million are required to contribute 1% of the total construction value towards public art. The work is subject to a Public Art Strategy, which is requested to be provided as a condition of approval.

An indicative public art design including local rural elements, colours and materials has been included on the Elevations attached at **Appendix A**; with a finalised design subject to the details included within a Public Art Strategy prepared by a local artist of the applicants choosing.



## 5.6 Local Planning Policy 2.3 - Development Standards for Development Applications

The Local Planning Policy 2.3 (LPP 2.3) establishes minimum standards regarding landscaping and drainage to maintain and enhance the amenity and natural environment of the area. In particular, it emphasises the importance of landscaping to the towns character and suggests that high value landscapes should be identified and preserved where possible. The provision of the LPP 2.3 relevant for the subject site are as follows:

- A Landscaping Plan is required.
- Plants identified as pests are not permitted.
- Deed of Agreement is required to ensure maintenance of landscaping within the verge.
- Landscaping should incorporate water sensitive urban design systems.
- Design of a stormwater management system.
- Potable water connection is required.

As demonstrated above, the proposed development intends to provide significant landscaping across the site, including a selection of native mature trees to provide shade in carparking areas. Additionally, the ATU system proposed for the management of both wastewater and stormwater will be designed to ensure that post-development discharges from the site will remain equal to or lesser than pre-development levels for a 100-year storm event. Finally, to ensure that best practice water sensitive urban design is achieved, significant landscaping will be integrated into the surface area of the ATU system.



## 6 GENERAL SITE DEVELOPMENT

This proposal has been designed to accommodate the various site constraints in a manner that is cohesive and in accordance with the provisions set out in Part 7 of the TPS 2 and Part 4 of the DRAFT LPS 3.

The following provides a summary of the general site development principles relevant to this application.

### 6.1 Vehicle Movement and Parking

Vehicle movements are accommodated by the provision of one (1) crossover into the site, intended to allow for full traffic movement with minimal impact to surrounding residents and businesses. The crossover is located along the western boundary of the site, providing two-way access onto Robertson Road. The crossover is sufficiently sized to accommodate multi-directional movements, with the minimum width of 7.5m. Vehicle movements will be accommodated by a number of internal driveways through the site with a minimum of 6m in width. All driveways and accessways will be clearly denoted and line marked to ensure functional and efficient movement throughout the carparking area.

In order to confirm the above, a Traffic Impact Statement (TIS) has been completed by KCTT, indicating that the internal movement network can accommodate all vehicle movements including service vehicles, and there is sufficient space for vehicles to exit onto Robertson Road safely in forward gear.

Furthermore, to ensure that all parking bays are appropriately sized and located in accordance with the relevant Australian Standards, a swept path analysis has also been included in the report.

A copy of the TIS is attached at **Appendix E** for reference.

### 6.2 Acoustic Considerations

To ensure that the proposed development complies with the allowable noise levels prescribed by the Environmental Protection (Noise) Regulations 1997, a Noise Impact Assessment (NIA) was conducted by Herring Storer acoustic consultants. The results of the assessment concluded that any the noise impact to surrounding residents, even using a conservative analysis, complies with the requirements of the Environmental Protection (Noise) Regulations 1997 at all times.

A further acoustic assessment was undertaken to determine the potential impact to the proposed development from the South Western Highway, in accordance with State Planning Policy 5.4 Road and Rail Noise (SPP 5.4). The report found that the impact to the proposed development would not exceed the maximum allowable noise levels, and as a result concludes that no noise amelioration is required.

A copy of the NIA is attached at **Appendix F** for reference.

### 6.3 Bushfire Considerations

A Bushfire Management Plan (BMP) has been prepared for the subject site by Smith Consulting in support of this application. The BMP demonstrates that the proposed development is subject to a BAL of 29 or less. The BMP also demonstrates compliance with all other provisions of SPP 3.7 including site access and provision of water.

A copy of the attached BMP is included at **Appendix D** for reference.



## 6.4 Landscaping

Section 7.7.5 of the TPS 2 sets the landscaping requirements within parking areas as being a minimum of 1m<sup>2</sup> for every 10m<sup>2</sup> of parking area. In addition to this, it requires that a landscaping strip of at least 1.5m width be provided between any parking areas adjoining street boundaries.

Additionally, in LPS 3, section 47 requires 10% of the total site area to be landscaped, with at least 5% included in the front setback area. It also suggests that only native species with low water usage should be considered, and where possible, should be integrated into local stormwater management to achieve water sensitive urban design outcomes. The scheme also includes a provision to include a 'shade tree' within parking areas at a rate of 1 tree every 12m. A breakdown of the above calculations has been provided in **Table 2** below.

TPS 2 REQUIREMENT	TOTAL REQUIRED	PROPOSED	COMPLIES?
1m <sup>2</sup> per every 10m <sup>2</sup> of carparking area	198m <sup>2</sup>	352m <sup>2</sup>	YES
Landscape strips of minimum 1.5m width to be provided between parking areas and adjoining streets	18m <sup>2</sup>	18m <sup>2</sup>	YES
LPS 3 REQUIREMENT	TOTAL REQUIRED	PROPOSED	COMPLIES?
10% in total, comprised of 5% of the front setback	346m <sup>2</sup>	408m <sup>2</sup>	YES
All external parking areas shall include shade trees at the rate of 1 tree per 4 parking bays	12.75	13 trees	YES

**Table 11 Demonstration of compliance with landscaping requirements**

This proposal complies with the landscaping requirements of the TPS 2 and LPS 3 as demonstrated in the table above. The total area of landscaping proposed is 408m<sup>2</sup> including a 1.5m wide landscaping strip along the street boundary to Robertson Road, and the provision of 13 trees within the carpark area.

The site landscaping has been included on the Development Plans attached at **Appendix A**.

## 6.5 Building Bulk & Scale

The proposed development will incorporate various design elements to reduce the bulk of the development such as the protrusion of awnings from facades and clear window panelling to allow for visual permeation.

The scale of the proposed development will be double storey to reflect surrounding development with a designed height of 7m.

## 6.6 Residential Interface

Low-density residential development currently exists to the rear of the subject site on the other side of the South Western Highway, however, the rear façade of the building will be significantly distanced from the nearby residences by the separation of the highway and parallel residential street. Furthermore, the colours and materials selected for the façade will be integrated with the surrounding character and amenity of the area, ensuring no negative visual impact as a result of this development.



There are also a small number of rural residential lots on the other side of Robertson Road to the west, which may have limited views of the proposed development. To soften this impact, significant landscaping has been proposed between the street boundary and carparking areas.

## 6.7 Drainage and Waste Management

The subject site is currently serviced by a connection to scheme water. Drainage has been integrated into the site as part of the Effluent Disposal - Secondary Treatment System (ATU) proposed for the management of wastewater generated by the development. The suitability of the soil to accommodate the system has been assessed by a credited Geotechnical Consultant to ensure that the expected demand from the proposed uses can be suitably dispersed. The system is to be located within the western portion of the carparking area and will include significant landscaping.

A Site and Soil Evaluation report prepared by Water Installations Pty Ltd for the whole of Parent Lot 9051 has been provided at **Appendix G** to demonstrate that the subject site is able to accommodate any proposed ATU system.

Waste management, including the storage of bins and waste collection, has been considered in the design of the proposed development. A swept path analysis has also been conducted as part of the TIA to ensure that any waste vehicles entering the site have sufficient room for safe movement and are able to exit the lot in forward gear. Storage locations and waste collection points have also been included on the development plans attached at **Appendix A**.

## 6.8 Telecommunications and Electrical Services

The subject site is currently serviced with connections to electricity and telecommunications.

## 6.9 Building Setbacks

In accordance with Table 4 of the TPS 2, selected uses in the Showroom, Warehouse, Light Industry and General Industry Zones are to have the following setbacks as demonstrated in **Table 6** below:

USE	FRONT SETBACK	SIDE SETBACK	REAR SETBACK
Showroom	9m	*	*
Warehouse	9m	*	*
Light Industrial	9m	*	*
General Industrial	9m	6m	6m
All Other Uses	9m	*	6m

**Table 12** TPS 2 setback requirements

- \* For a masonry parapet wall - nil; for metal or timber framed construction - 2.1 metres or the height of the wall whichever is greater.

Although the subject site is not located within the abovementioned zones, it is considered to most closely fit the Light Industrial use in the table above.

In accordance with Table 4.2 of the DRAFT LPS 3, the following setbacks apply for developments within the Service Commercial zone as depicted in **Table 13** below:

ZONE	FRONT SETBACK	SIDE SETBACK	REAR SETBACK
Service Commercial	12m	6	6

**Table 13** LPS 3 setback requirements





The proposed development is intended to be setback a total of 62m from the primary street (Robertson Road). It has proposed nil setbacks to the sides, and a 2m rear setback from the boundary to the South Western Highway.

In light of the above, the proposed development complies with the setback requirements contained in the TPS 2. However, it does not currently comply with the setback requirements contained in the DRAFT LPS 3, as the rear setback is proposed for 2m rather than the required 6m.

Although this requirement is not met, it is considered relevant that the rear setback is the South Western Highway which acts as a barrier between the proposed development preventing it from impacting on development nearby. The highway is further screened from view by a buffer of remnant vegetation which further reduces any impact that the proposed development may have as a result of the reduced setback.

Furthermore, the proposed setback aligns with the setbacks of the nearby adjacent developments already existing or approved for the site, therefore reflecting the existing character of the area.



## 7 CONCLUSION

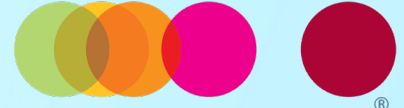
The proposed development of the Community Purpose facility and Place of Worship at Lot 128 Robertson Road, Byford, is consistent with the objectives and requirements of the zoning under the MRS, TPS 2, DRAFT LPS 3, Byford District Structure Plan, Local Structure Plan, and all relevant state and local planning policies.

The proposed development has been designed with a high level of architectural merit to ensure that it enhances the aesthetic and functional amenity of the wider area.

All scheme water, electrical and telecommunication services to the site have been previously established and are not intended to be significantly altered within this proposal. Drainage and wastewater will be appropriately managed on-site by the provision of a suitably sized ATU effluent disposal system.

Given the above assessment, it is considered that the proposal is compliant with all applicable statutory policy requirements and will offer a significant contribution towards the development of a successful and functional "Service Commercial" precinct that facilitates the large format, car-based service needs of the local population.

It is therefore requested that the Shire considers the application favourably in its determination and that the proposed development be approved.

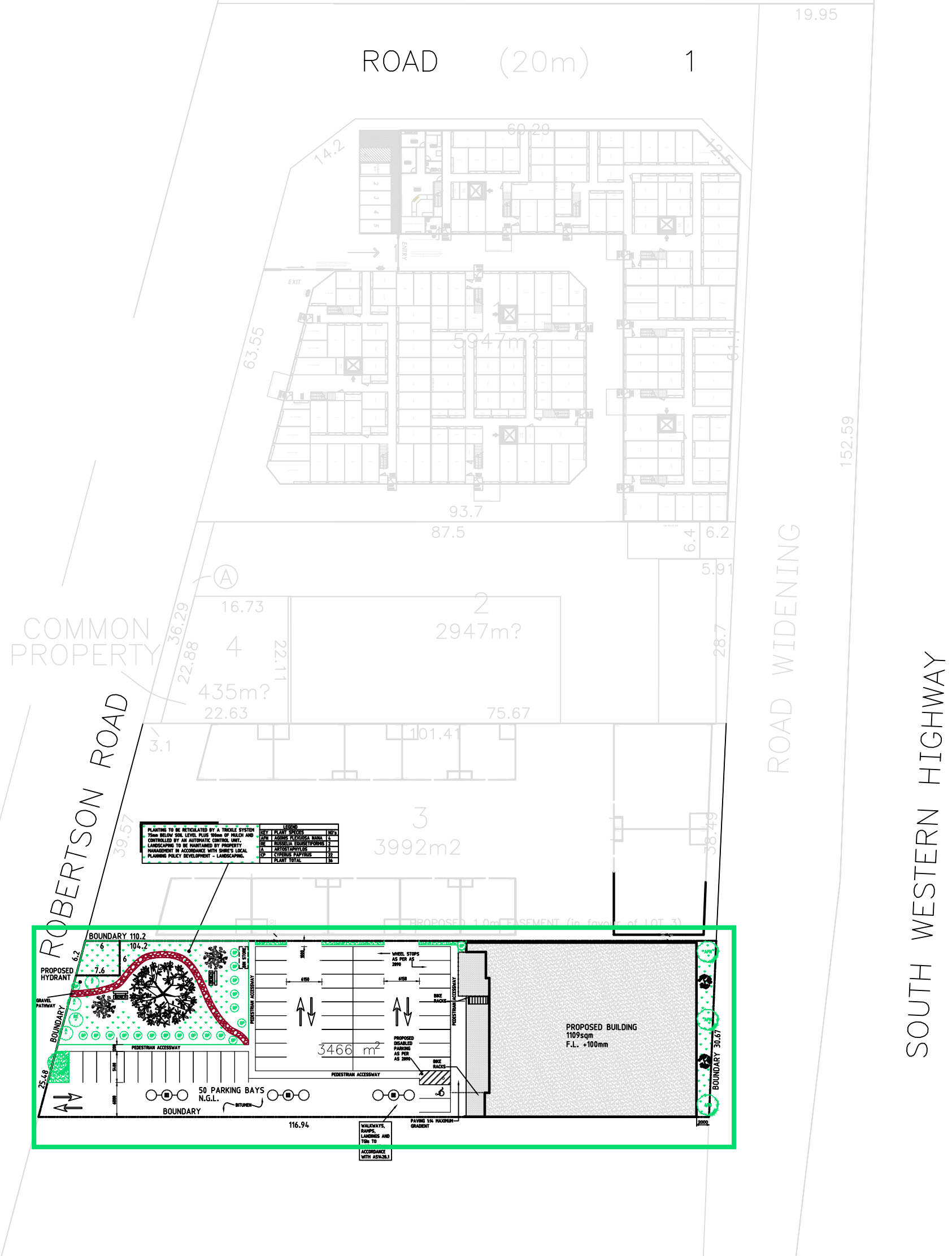


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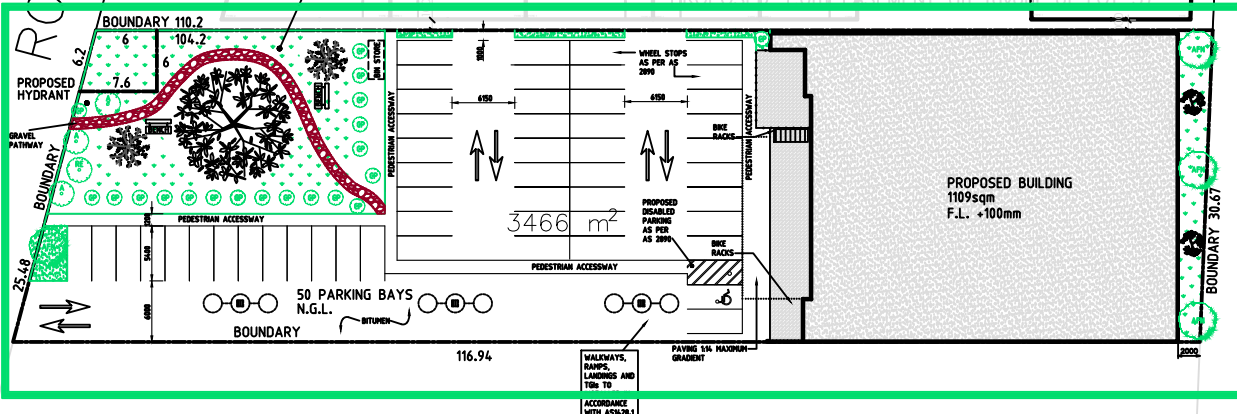
# APPENDIX A

# DEVELOPMENT PLANS



PLANTING TO BE RETICULATED BY A TRICOLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF MULCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY DEVELOPMENT - LANDSCAPING.

PLANT SPECIES	NO.
ACACIA PLEUROCARPA NANA	1
ACACIA ROBINSONIANA	2
ACACIA SP.	2
CEPHEUS PAPYRUS	22
<b>PLANT TOTAL</b>	<b>27</b>

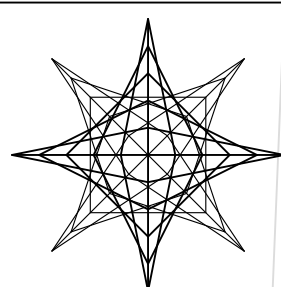
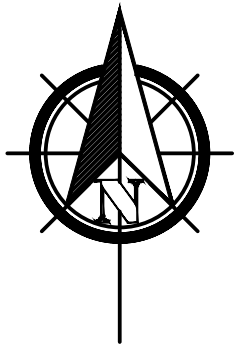


STAGE 2

128  
1.3174ha

**KEY PLAN**

SCALE NTS  
LOT 4 ROBERTSON ROAD BYFORD



CLIENT <b>CENTREPOINT HUB - BYFORD CAMPUS</b>		<table border="1"> <tr> <td>Rev.</td> <td>Date</td> <td>Comment</td> </tr> <tr> <td>A</td> <td>31.1.2022</td> <td>ISSUE FOR COMMENT</td> </tr> <tr> <td>B</td> <td>23.5.2022</td> <td>DEVELOPMENT APPROVAL</td> </tr> </table>	Rev.	Date	Comment	A	31.1.2022	ISSUE FOR COMMENT	B	23.5.2022	DEVELOPMENT APPROVAL	
Rev.	Date		Comment									
A	31.1.2022	ISSUE FOR COMMENT										
B	23.5.2022	DEVELOPMENT APPROVAL										
Project <b>PROPOSED PUBLIC ASSEMBLY COMMUNITY HUB LOT 128 (LOT 4) ROBERTSON ROAD BYFORD WA</b>		<table border="1"> <tr> <td>Rev.</td> <td>B</td> <td rowspan="2">Job No. <b>577-1</b></td> </tr> <tr> <td>Drawn</td> <td>PAH</td> </tr> <tr> <td>Date</td> <td>JANUARY 2022</td> <td rowspan="2">Sheet 1 OF 5</td> </tr> <tr> <td>Scale</td> <td>AS SHOWN</td> </tr> </table>	Rev.	B	Job No. <b>577-1</b>	Drawn	PAH	Date	JANUARY 2022	Sheet 1 OF 5	Scale	AS SHOWN
Rev.	B	Job No. <b>577-1</b>										
Drawn	PAH											
Date	JANUARY 2022	Sheet 1 OF 5										
Scale	AS SHOWN											
Title <b>PROPOSED KEY PLAN</b>												

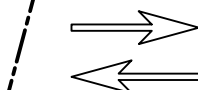
ROBERTSON

BOUNDARY 110.2

PROPOSED HYDRANT

GRAVEL PATHWAY

BOUNDARY



BOUNDARY

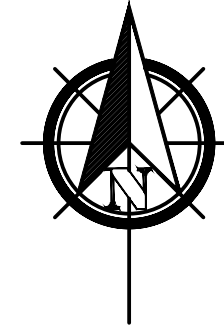
PARKING BAYS	50
AUDITORIUM	300 SEATS
BUILDING FOOTPRINT	1109sqm
LANDSCAPING	670sqm
LAND	3466sqm
CLASS	9A PUBLIC ASSEMBLY
ZONE	MIXED BUSINESS / SERVICE COMMERCIAL

<b>SOAKWELLS</b>	
6 No. CONCRETE SOAKWELLS	1800 x 1800mm
3 No. CONCRETE SOAKWELLS	1800 x 1800mm WITH GRATES
ALL TO HAVE TRAFFICABLE CONCRETE LIDS	

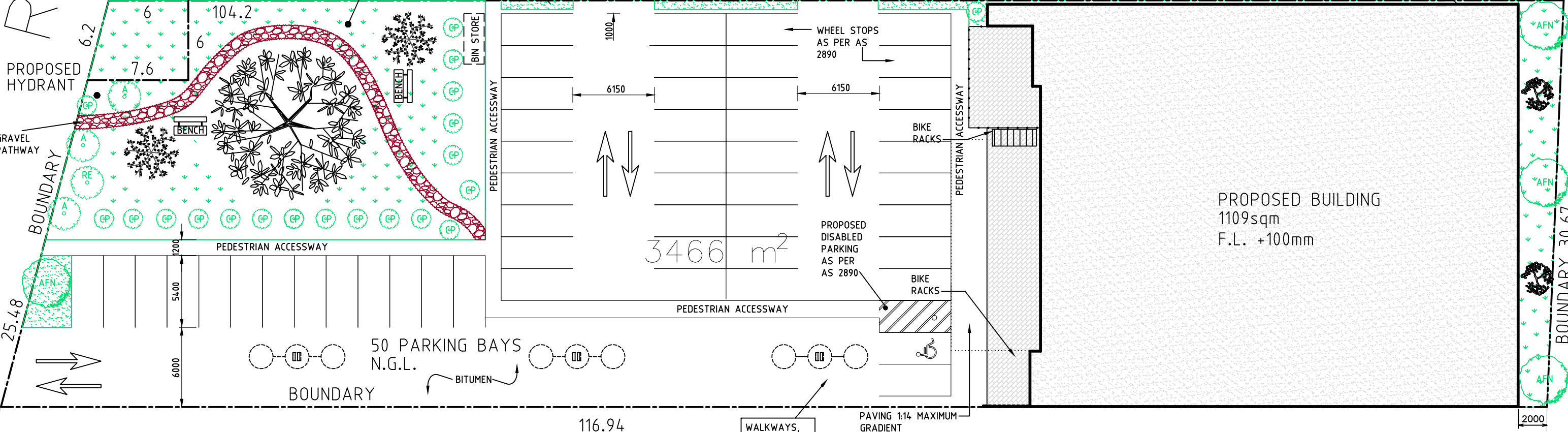
LEGEND		
KEY	PLANT SPECIES	NO's
AFN	AGONIS FLEXUOSA NANA	4
RE	RUSSELLIA EQUISETIFORMIS	2
A	ARTOSTAPHYLOS	3
CP	CYPERUS PAPHYRUS	22
PLANT TOTAL		36

PLANTING TO BE RETICULATED BY A TRICKLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF MULCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY DEVELOPMENT - LANDSCAPING.

3  
3992m<sup>2</sup>



PROPOSED 1.0m EASEMENT (in favour of LOT 3)

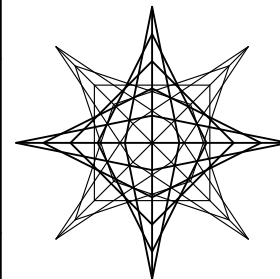


**SITE PLAN**

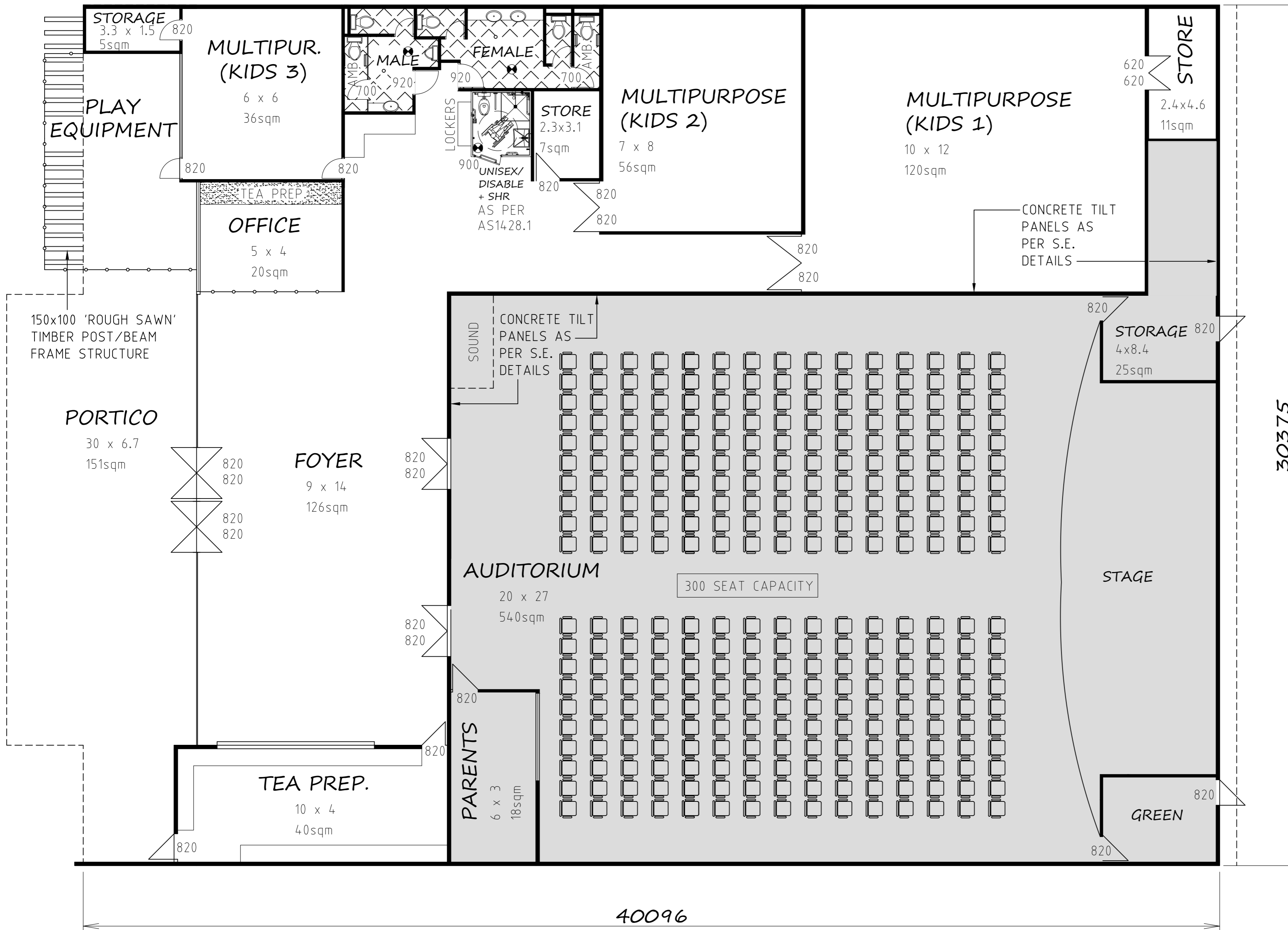
SCALE 1:300  
LOT 4 ROBERTSON ROAD BYFORD



CLIENT	<b>CENTREPOINT HUB - BYFORD CAMPUS</b>
Project	<b>PROPOSED PUBLIC ASSEMBLY COMMUNITY HUB</b>
	<b>LOT 128 (LOT 4) ROBERTSON ROAD BYFORD WA</b>
Title	<b>PROPOSED SITE LOCATION</b>



Rev.	Date	Comment
A	31.1.2022	ISSUE FOR COMMENT
B	23.5.2022	DEVELOPMENT APPROVAL
Rev.	B	Job No.
Drawn	PAH	<b>577-2</b>
Date	JANUARY 2022	Sheet 2 OF 5
Scale	AS SHOWN	



# FLOOR PLAN

SCALE 1:100

LOT 4 ROBERTSON ROAD BYFORD  
3of5 (A2 SHEET)



75x300 DEEP FRAME, COLORBOND MONUMENT FINISH.

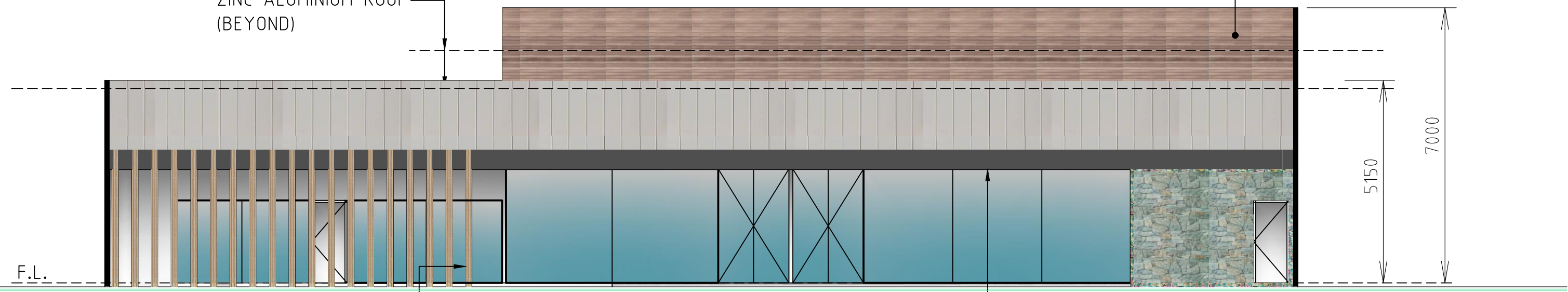
3 OFF-4000x1500 ARTWORK - 'RUSTIC' FINISH. LOCAL ARTIST TO FINALISE SELECTION.

**EAST ELEVATION**  
SCALE 1:100  
SOUTH WEST HIGHWAY

EXISTING EUCALYPTUS TREES (2 OFF) TO REMAIN.

ZINC ALUMINIUM ROOF (BEYOND)

DECO CLAD V-GROOVE CLADDING IN DECOWOOD FINISH WEATHERED TIMBER

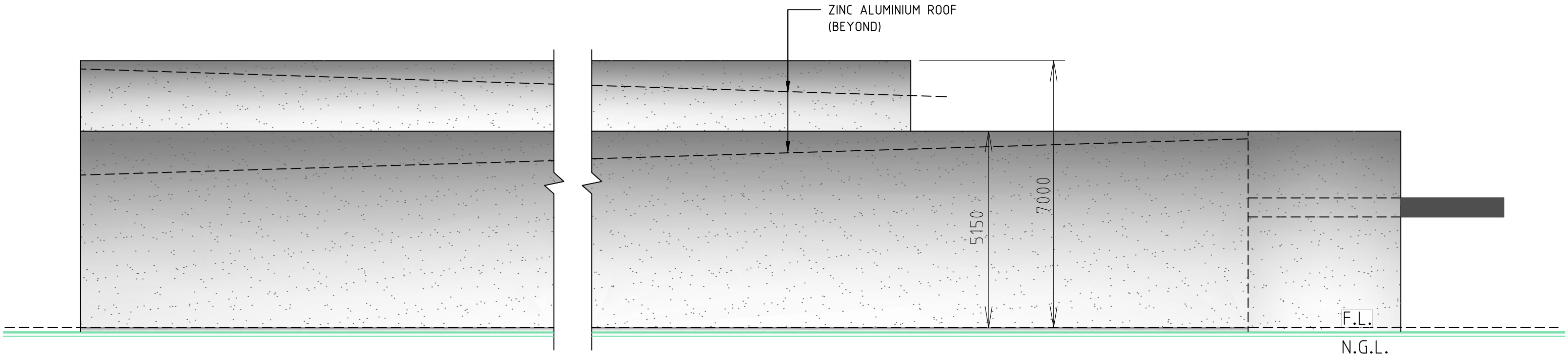


150x100 'ROUGH SAWN' TIMBER POST/BEAM

**WEST ELEVATION**  
SCALE 1:100  
ENTRANCE

CANOPY COLORBOND MONUMENT FINISH

LOT 4 ROBERTSON ROAD BYFORD  
4 of 5 (A3 SHEET)



# **SIDE ELEVATION**

SCALE 1:100

LOT 4 ROBERTSON ROAD BYFORD  
5of5 (A3 SHEET)





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# APPENDIX B

# CERTIFICATE OF TITLE

WESTERN



AUSTRALIA

REGISTER NUMBER <b>128/DP156237</b>	
DUPLICATE EDITION <b>2</b>	DATE DUPLICATE ISSUED <b>9/1/2009</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **258** FOLIO **190A**

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

*BGRoberts*  
REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 128 ON DEPOSITED PLAN 156237

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

BYFORD PROJECT 2018 PTY LTD OF LOT 128 SOUTH WESTERN HIGHWAY BYFORD WA 6122  
(T O407586 ) REGISTERED 15/5/2020

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

1. \*O407587 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 15/5/2020.

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

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

**STATEMENTS:**

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

SKETCH OF LAND: 258-190A (128/DP156237)  
PREVIOUS TITLE: 1057-724  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: SHIRE OF SERPENTINE-JARRAHDALE

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING O407587

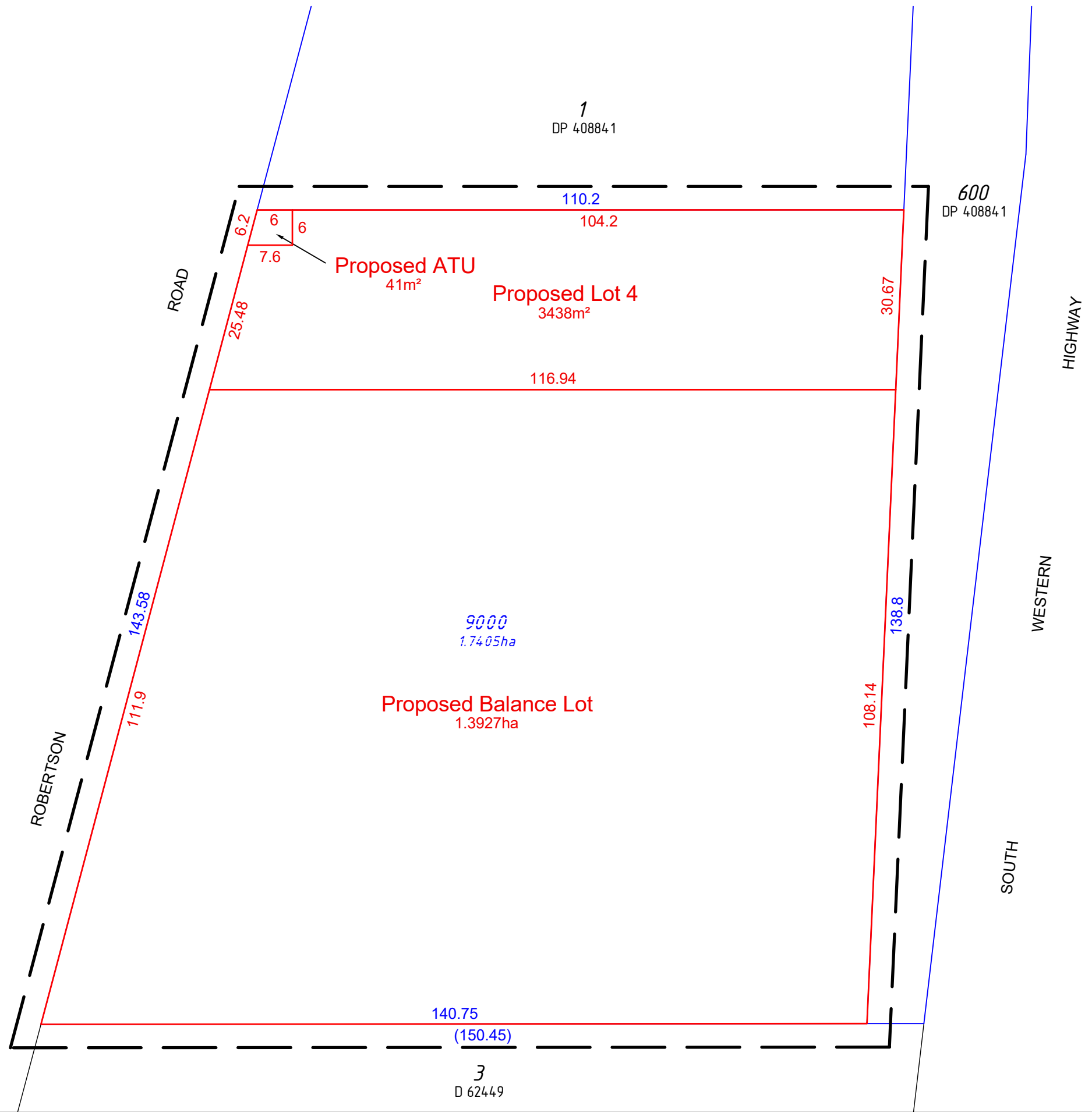


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PLANNING & SURVEY SOLUTIONS

# APPENDIX C

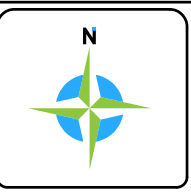
# PLAN OF SUBDIVISION



SUMMARY	
Lot 128 South West Highway, BYFORD	
Application Type	Subdivision
Parent Lot	9000
Parent Graphic	DP 408841
Certificate of Title	Volume XXXX Folia XXX
Total Area	1.7405ha
Local Authority	Shire of Serpentine-Jarrahdale
TPS	XX
Zoning	RXX
Proposed No. of Lots	2

This plan, which was prepared by MNG for PARSONS GROUP, shows the proposed subdivision of LOT 9000 ON DP 408841 and is intended to accompany an application to the Western Australian Planning Commission (WAPC) for approval to subdivide. All information relating to the subdivision, including lot dimensions and areas are subject to approval by the WAPC, the Local Authority and other servicing authorities having an interest in the land. Existing boundaries shown hereon are a graphical representation only, they have been extracted from Landgate's Spatial Cadastral Database, which is only a model of the cadastre, and has not been re-established by survey. MNG does not guarantee position unless stated otherwise. Existing easements, encumbrances and interests are not necessarily depicted on the plan and a current title search is recommended to check this information prior to sale and development of proposed lot(s).

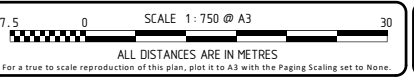
The use of this plan for other than the purpose for which it is commissioned is strictly prohibited. In particular, the information shown on the plan is not relied upon for financial dealings involving the land either in the whole or in the part. The contents of this plan are current and correct as of the date stated within the revision panel. All consultants and persons wishing to utilise this data should satisfy themselves of this plan's currency by contacting the McMullen Nolan Group. Contours are compiled from MNG Survey Data and Landgate SLIP Data and are subject to change without notice. This plan is not to be distributed without this note, which is an integral part of the plan.



CLIENT:  
**PARSONS MANAGEMENT GROUP**

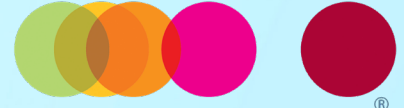
**PROPOSED SUBDIVISION**  
**LOT 9000 ON DP 408841**  
**South West Highway, Byford**

FILES  
mapCOGO:-  
Control Register:-  
File Name:-  
103178ap-022a.dgn



M C MULLEN NOLAN GROUP  
Level 1, 2 Sabre Crescent  
Jardlot, W.A. 5164  
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W.A. 6164, Australia  
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Fax: (08) 6436 1500  
info@mngsurvey.com.au  
www.mngsurvey.com.au  
ABN 90 009 363 311

Project Manager	Neil Davidson	Datum	PCG94
<b>103178- 022 - A</b>		Job Number	103178-022
Revision		Version	



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PLANNING & SURVEY SOLUTIONS

# APPENDIX D

# BUSHFIRE MANAGEMENT PLAN



# **BUSHFIRE MANAGEMENT PLAN**

**Lot 128 Robertson Road, Byford**  
Shire of Serpentine Jarrahdale



**Prepared by Ralph Smith**  
**BPAD27541**  
**smith.consulting@bigpond.com**  
**0458 292 280**

Site visited 7 November 2022; Report completed 22 December 2022

## Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address:

Site visit: Yes  No

Date of site visit (if applicable): Day  Month  Year

Report author:

WA BPAD accreditation level (please circle):

Not accredited  Level 1 BAL assessor  Level 2 practitioner  Level 3 practitioner

If accredited please provide the following.

BPAD accreditation number:  Accreditation expiry: Month  Year

Bushfire management plan version number:

Bushfire management plan date: Day  Month  Year

Client/business name:

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

None of the above

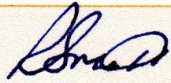
**Note:** Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The vulnerable land use (Guidelines section 5.5.1) criteria were consulted in determining whether this is a vulnerable land use or not. The second dot point provides an example of a large place of worship (but does not define large) as a possible vulnerable land use. This site is some distance from Byford and all attendees would need to provide their own transport to get to the site. This means that the attendees can evacuate quickly and easily if required. This means that evacuation would not pose a significant issue for the emergency services.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author



Date

## NOTE

This Bushfire Management Plan (BMP) has been developed by Smith Bushfire Consultants Pty Ltd for the exclusive use of the client, Harley Dykstra, and their agents. The BMP contains two components being the BAL Contour Map for the proposed church and associated infrastructure, and a Bushfire Hazard Level Map the portion of the remainder of the lot which is identified as Stage 2 Proposed Balance Lot.

The plan has been compiled using the standard methodologies required by Western Australian government departments and agencies. It is based on the following:

- *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, December 2015
- *Guidelines for Planning in Bushfire Prone Areas*, December 2021
- *Australian Standard 3959 – Construction of buildings in bushfire-prone areas. (Incorporating amendments No 1 and No 2)*, November 2018

The techniques described in the above publications have been applied in the appropriate areas and circumstances for the development of this document.

Where there was no public access the interpretation is based on photographic and satellite imagery, and a laser distance meter was used to measure distances and effective slope.

It is recommended that this Bushfire Management Plan be revised every five years to ensure that it remains relevant and in-line with current requirements. This will optimise protection. It is proposed that the property owners undertake the review.

## DISCLAIMER

This Bushfire Management Plan has been prepared in good faith. It is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this plan is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error or omission from this publication.

Smith Bushfire Consultants Pty Ltd has exercised due and customary care in the preparation of this Bushfire Management Plan and has not, unless specifically stated, independently verified information provided by others.

Any recommendations, opinions or findings stated in this report are based on circumstances and facts as they existed at the time Smith Bushfire Consultants Pty Ltd performed the work. Any changes in such circumstances and facts upon which this document is based may adversely affect any recommendations, opinions or findings contained in this plan.

## Document control

Report Version	Purpose	Author/reviewer and accreditation details	Date Submitted
1	Original BMP to support this development	Ralph Smith	20/12/2022
1.1	Minor text change	Ralph Smith	22/12/2022

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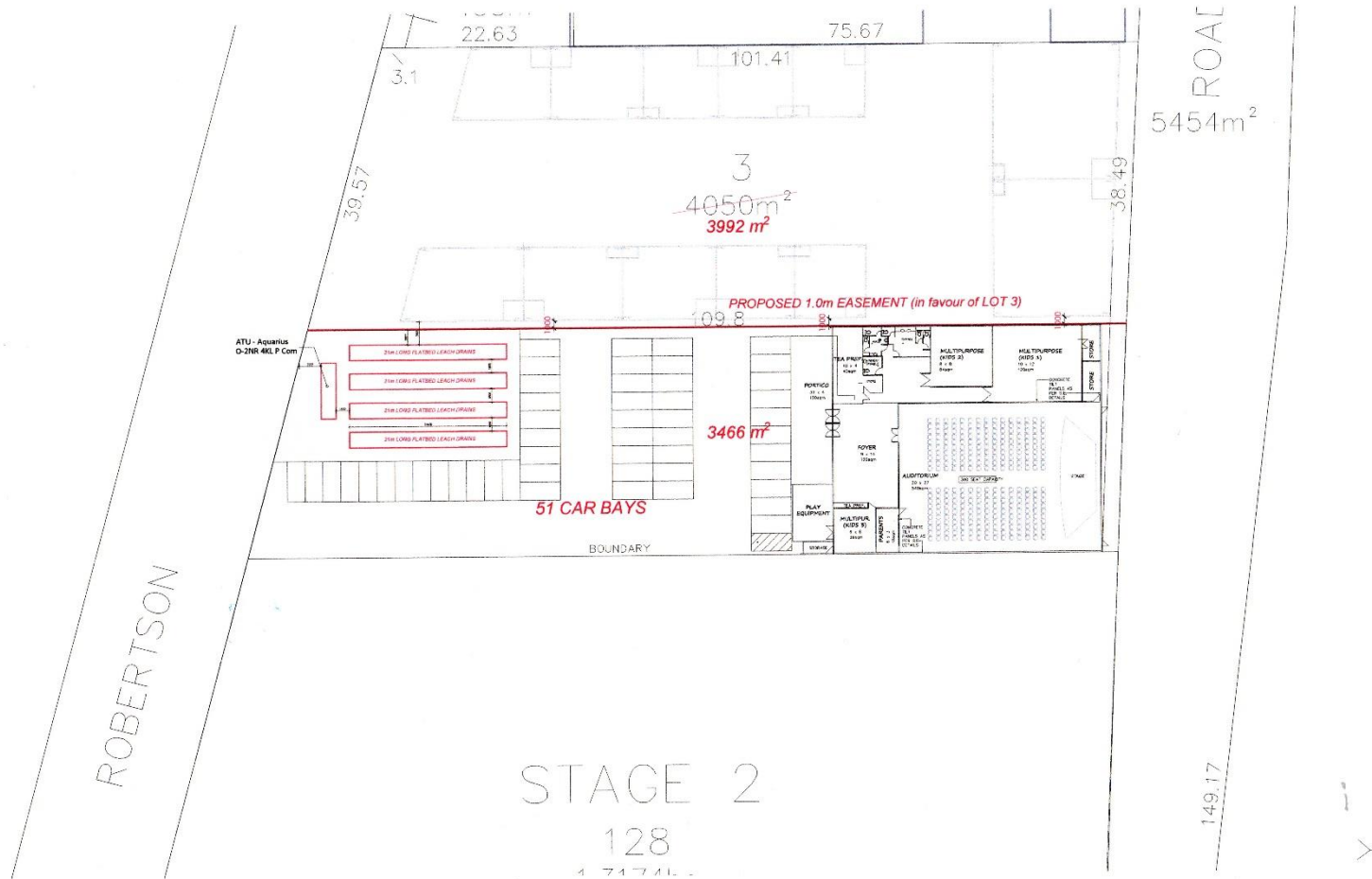


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**Section 1: Proposal Details**

This BMP has been developed specifically for Lot 128 Robertson Road, Byford, in accordance with the currently applicable Guidelines. The site is effectively cleared of native vegetation. The proposed development involves building a church and supporting infrastructure that will contain people periodically (Proposed Lot 4). The BMP has been expanded to include the southern portion of the lot, and is recorded as Stage 2 (Proposed Balance Lot).



**Figure 1.** A copy of the site plan as provided with the development application.

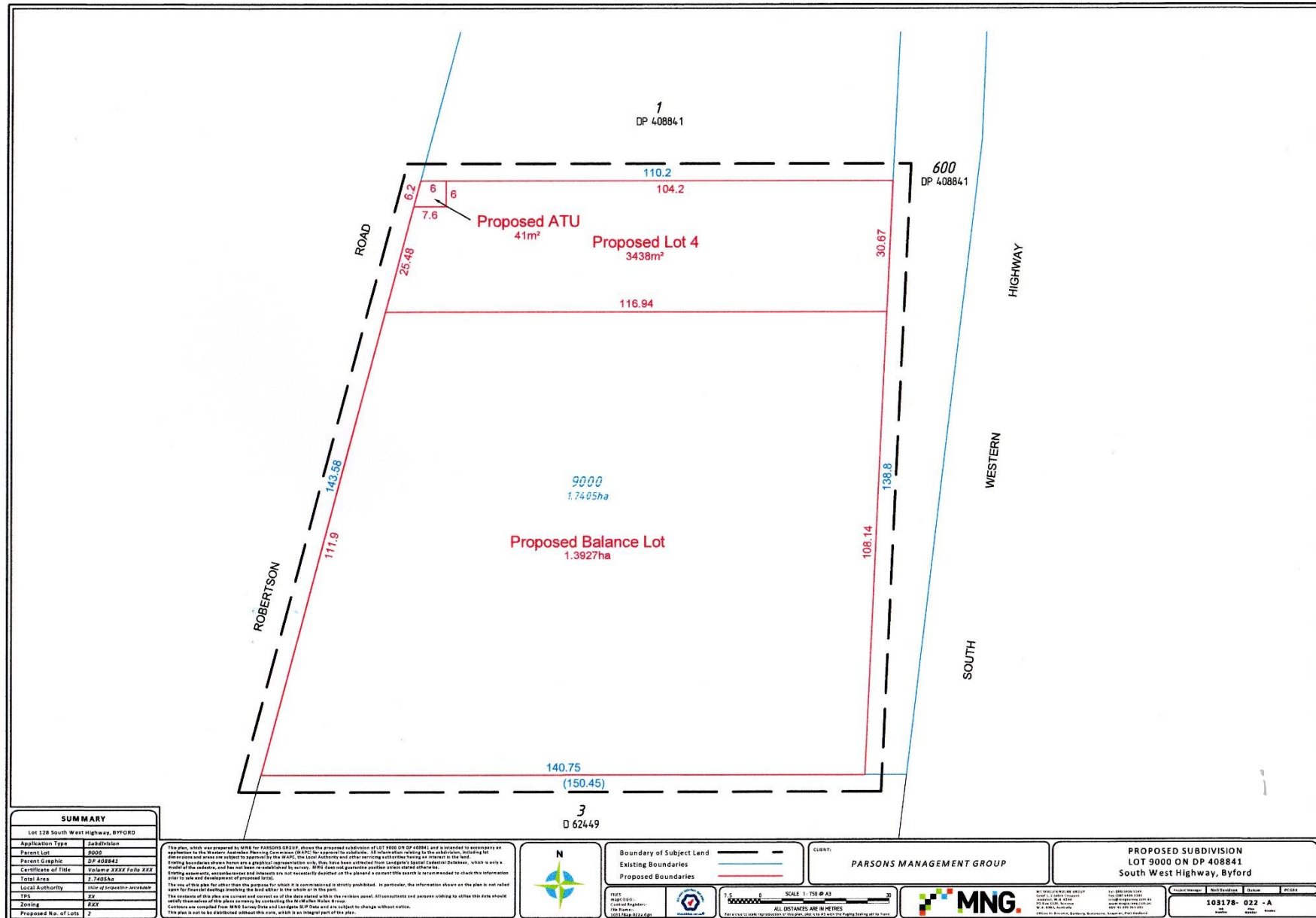


Figure 2. The map showing the proposed church location (Proposed Lot 4) and the Proposed Balance Lot.

The BMP is developed to comply with the State Planning Policy 3.7. The *State Government Guidelines for Planning in Bushfire Prone Areas* version 1.3 section 5.8.3 states that *In the local planning scheme, Class 4 to 9 buildings will usually require planning approval. The planning process will apply the bushfire protection criteria to ensure that the optimal outcome is achieved for bushfire protection, such as appropriate siting of the building on the lot/s, the provision of water tanks and passing bays. In these instances the applicant has the discretion to utilise any or all of the elements of AS 3959 in the construction of the building that they deem appropriate.* The church facility is classified as a Class 9b building by the National Construction Code (NCC).

It must be noted that under building legislation, bushfire related construction requirements do not apply to Class 4 to 9 buildings in designated bushfire prone areas. The Building Code of Australia (BCA) only applies construction standards for Class 1, 2 or 3 buildings or Class 10a buildings or decks associated with a Class 2 or 3 building (under Part G5), and Class 1 or Class 10a buildings or decks associated with a Class 1 building (under Part P2.3.4 and Part 3.7.4). Under building legislation, bushfire related construction requirements do not apply to Class 4 to 9 buildings in designated bushfire prone areas. This development is for industrial or commercial buildings other than Class 1, 2 or 3 buildings and therefore AS 3959 construction standards do not apply as they are not triggered through the BCA.



**Figure 3.** Aerial photo of the bushfire prone area for the subject site.

## Section 2: Environmental Considerations

### Subsection 2.1: Native Vegetation – modification and clearing

The site is already cleared of native vegetation and no additional clearing is required associated with this development. There is only introduced grass vegetation on the development site which will be managed.

### Subsection 2.2: Re-vegetation/Landscape Plans

There is no re-vegetation or landscape plans for this development.

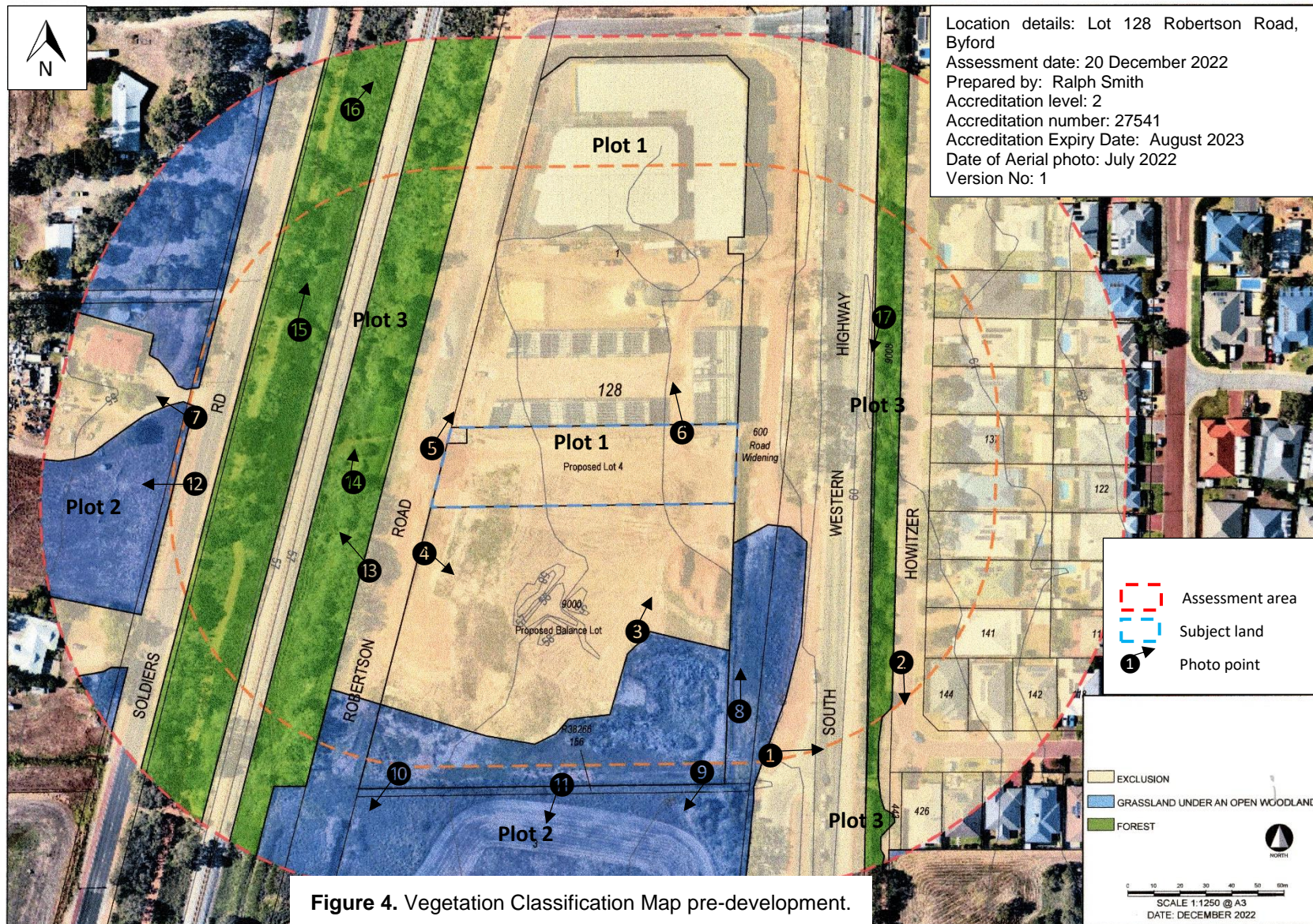
<b>Additional environmental consideration</b>
---

A desk top analysis was undertaken on the State Government websites and the following environmental values were assessed.

<b>Key environmental feature (information in brackets refers to mapping data source)</b>	<b>Yes / No / Potentially occurring within the site</b>	<b>If Yes / Potentially, describe value that may be impacted</b>
Threatened and priority flora	No	
Threatened and priority fauna	No	
Threatened ecological community	No	
Bush Forever Areas 2000	No	
Clearing regulations – Environmentally Sensitive Areas	Yes	This site and the suburb to the east are identified as an environmentally sensitive area
Carnabys Cockatoo confirmed roost site	No	
Black Cockatoo breeding sites buffered	No	

**Section 3: Bushfire assessment results**

**Subsection 3.1: Assessment Inputs**





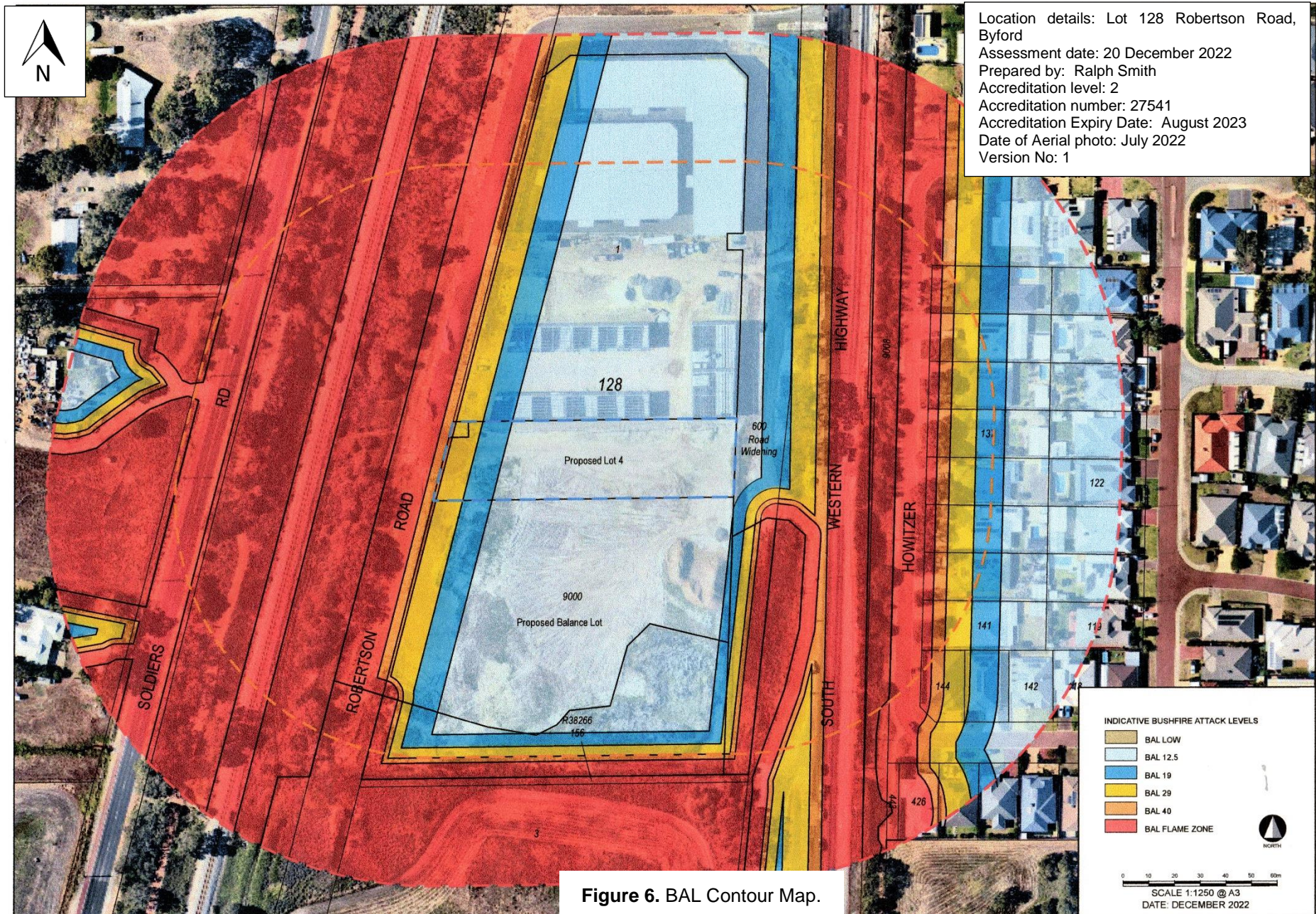






Figure 7. Bushfire Hazard Level Map.

**Plot 1**  
**Exclusion**  
**Clause 2.2.3.3 (e) and (f)**



**Photo ID: Photo 1** Looking across the road network to the west.



**Photo ID: Photo 2** Looking at the suburb to the west and the strip of forest adjacent to South Western Highway.



**Photo ID: Photo 3** Looking north across the development site.



**Photo ID: Photo 4** Looking across the development site.



**Photo ID: Photo 5** Looking at the end of Robertson Road and the buildings north of the development site.



**Photo ID: Photo 6** Looking at new buildings north of the development site.



7/11/2022 9:29:02 AM (+8.0 hrs) Dir=NW Lat=-32.23675 Lon=116.00291 Alt=88m MSL WGS 1984  
**Photo ID: Photo 7** Looking across the grass at the dwelling and APZ.

**Plot 2**

Class G – Grassland (AS 3959 vegetation classification G–22)



7/11/2022 9:17:38 AM (+8.0 hrs) Dir=VNW Lat=-32.23649 Lon=116.00562 Alt=93m MSL WGS 1984  
**Photo ID: Photo 8** The current grassland on the development site.



7/11/2022 9:18:38 AM (+8.0 hrs) Dir=SSW Lat=-32.23654 Lon=116.00524 Alt=91m MSL WGS 1984  
**Photo ID: Photo 9** The grassland on the southern end of the development site and the neighbouring land to the south.



7/11/2022 9:21:39 AM (+8.0 hrs) Dir=SSW Lat=-32.2364 Lon=116.00394 Alt=90m MSL WGS 1984  
**Photo ID: Photo 10** Looking at the grassland and then the forest.



7/11/2022 9:20:52 AM (+8.0 hrs) Dir=SSW Lat=-32.23649 Lon=116.00425 Alt=90m MSL WGS 1984  
**Photo ID: Photo 11** The grassland south of the development site.



**Photo ID: Photo 12** The grassland west of the rail reserve and Soldiers Road.

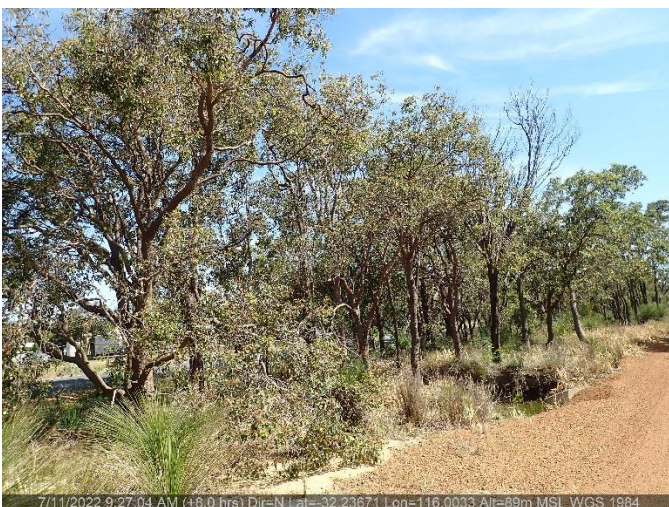
**Plot 3**  
Class A – Forest (AS 3959 vegetation classification A-03)



**Photo ID: Photo 13** The forest vegetation to the west of the development site.



**Photo ID: Photo 14** The forest vegetation to the west of the development site.



**Photo ID: Photo 15** The forest vegetation to the west of the railway line and development site.



**Photo ID: Photo 16** The forest vegetation to the east of the development site.



**Photo ID: Photo 17** The forest vegetation to the east of the development lot.

## Notes to Accompany Vegetation Classification

### 1. Plot 1

Exclusion – Low threat vegetation and non-vegetated areas  
 Clause 2.2.3.2 (e) and (f)

This plot comprises the current suburban development and associated infrastructure within the surrounding area. It also includes the two new commercial structures to the north of the development site. There is virtually no surface vegetation other than some grass in the southern portion of the lot, which will be converted to AS3959:2018 Exclusion- Low threat vegetation and also managed to comply with the Shire's firebreak notice.

### 2. Plot 2

Class G – Grassland (AS 3959 vegetation classification G–06)

This plot is the grassland to the south and west of the development lot. It also includes the grassland on the development site, but this vegetation on the development lot) will be converted to AS3959:2018 Exclusion – Low threat vegetation and also managed to comply with the Shire's firebreak notice.

### 3. Plot 3

Class A – Forest (AS 3959 vegetation classification A–03)

This is the forest that is east and south of the development lot. This forest is within the rail line corridor and the highway road reserve. The forest west of Robertson Road includes the vegetation either side of the railway line. The vegetation is quite narrow, particularly on the eastern side of the highway.

Slope

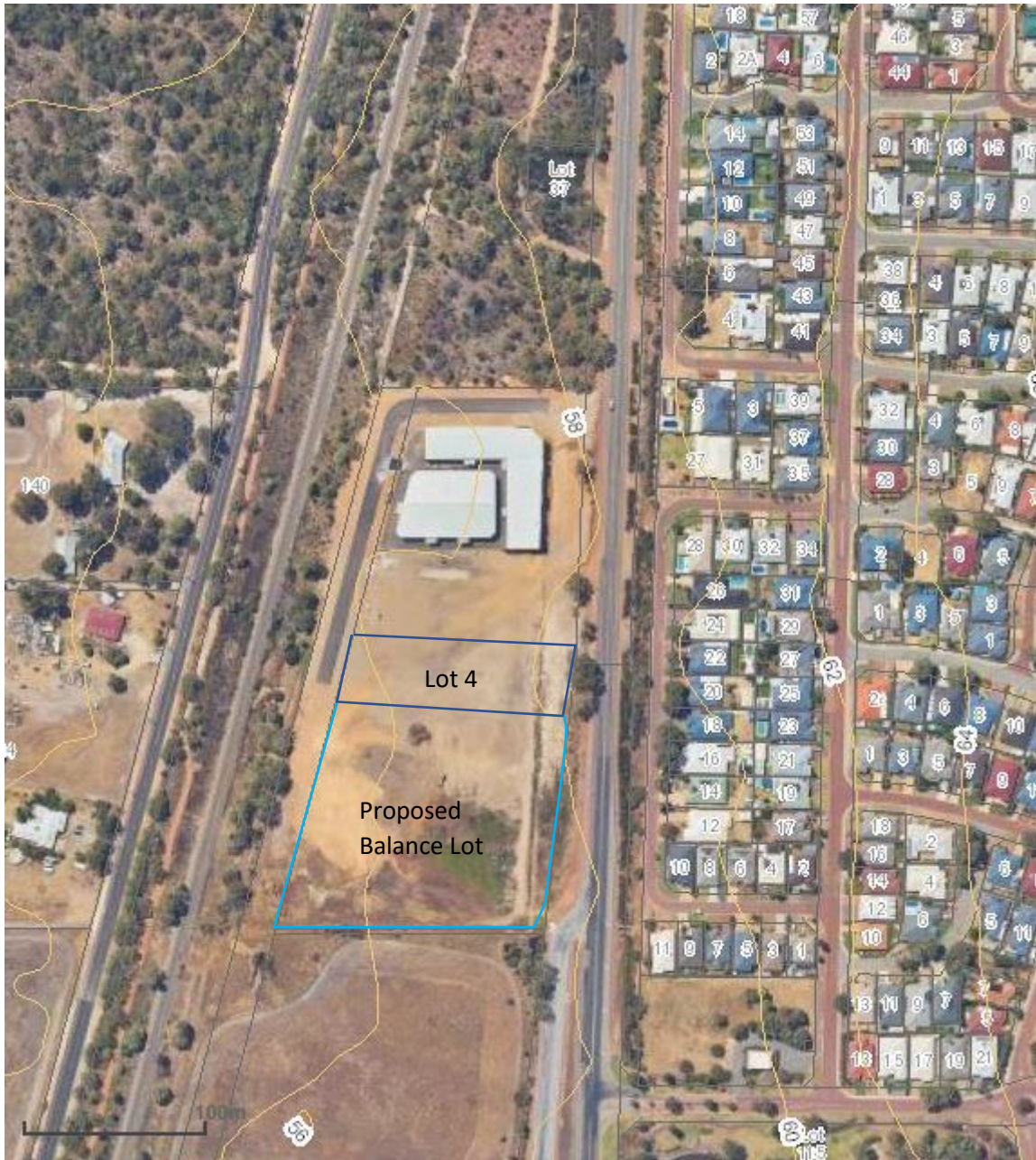


Figure 8. Aerial photo of the two-metre contour line.

The surrounding area slopes from the west to the east. This is a very limited slope.

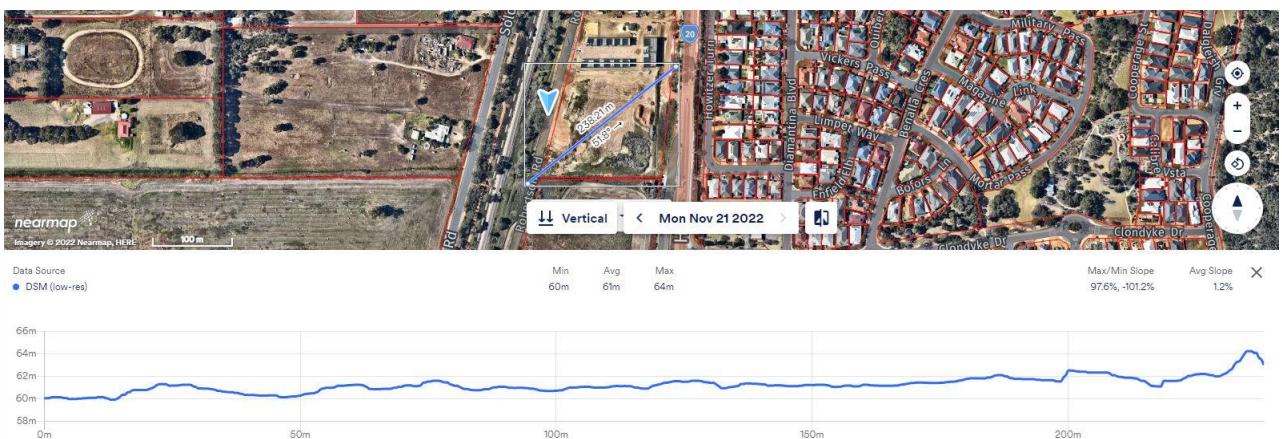


Figure 9. Indicative slope diagram.

**Subsection 3.2: Assessment outputs**

Method 1 BAL Determination				
Vegetation Area/Plot	Applied Vegetation Classification	Effective Slope Under the Classified Vegetation (degrees)	Separation Distance to the Classified Vegetation to the buildings (metres)	Bushfire Attack Level
1	Exclusion	Not applicable	Not applicable	LOW
2	Grassland	Upslope or level	21	12.5
3	Forest (to the church building)	Upslope	44	12.5
Determined Bushfire Attack Level				12.5

**Section 4: Identification of bushfire hazard issues**

The principle bushfire hazard is the forest native vegetation to the west and east and the grassland to the south of the development site.

The access to the proposed development along Robertson Road is greater than 200 metres and the vegetation to the west is forest.

By establishing a link between the church development on Proposed Lot 4 and the Proposed Balance Lot through the BMP where the grassland on the Proposed Balance Lot will be managed to the AS 3959 low threat vegetation criteria reduces the potential bushfire threat to the new buildings and also future buildings on the Proposed Balance Lot.



Figure 10. Access distance down Robertson Road.

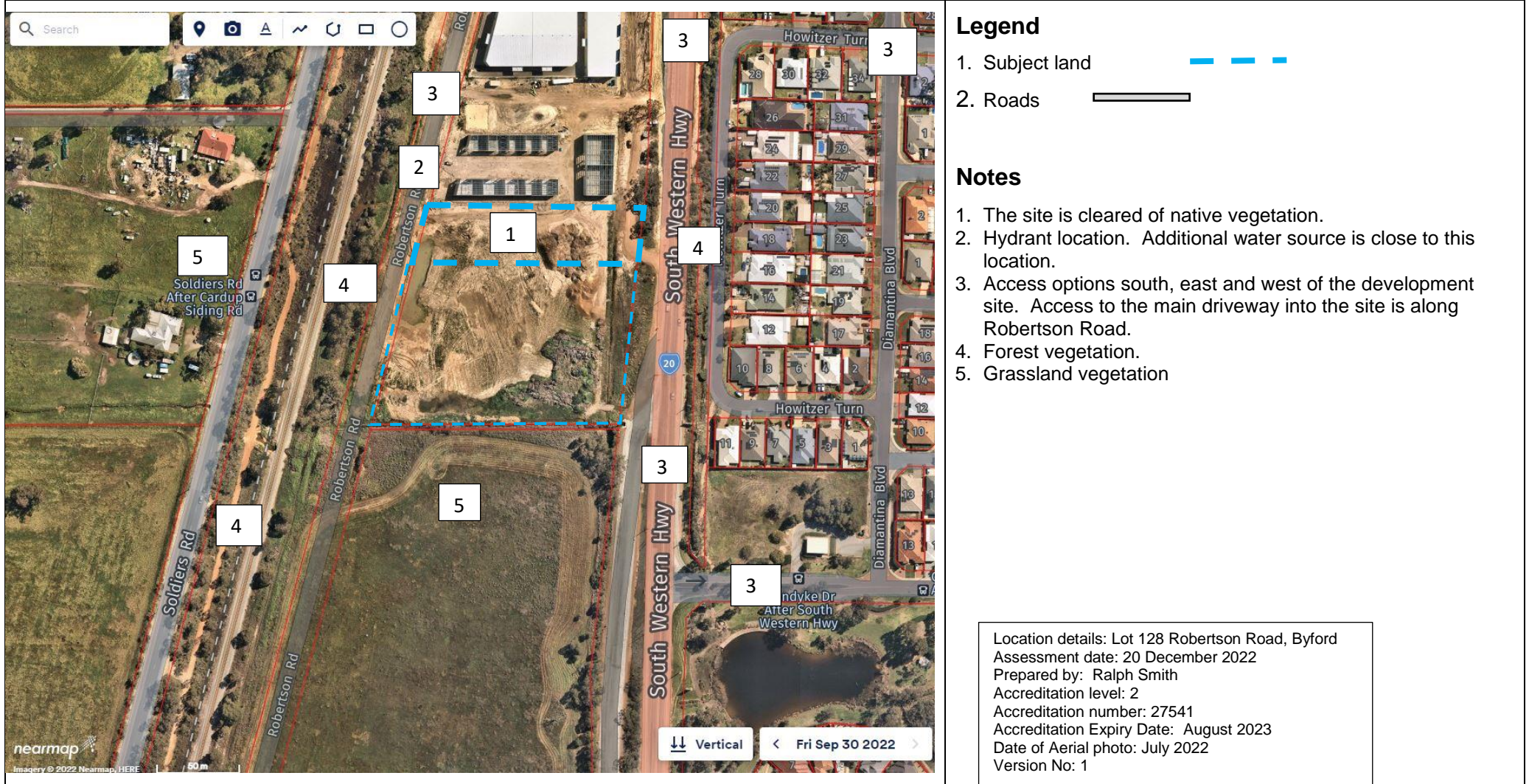


## Section 5: Assessment against the Bushfire Protection Criteria

### Subsection 5.1: Compliance

Bushfire protection criteria	Method of Compliance	Proposed bushfire management strategies
	Acceptable solutions	
<b>Element 1: Location</b>	A1.1 Development location	The lot has been developed in such a manner that on completion there is an opportunity to build on the lot with a maximum of BAL-29.
<b>Element 2: Siting and design</b>	A2.1 Asset Protection Zone (APZ)	There is no requirement for an APZ, but the lots with grassland must maintain the grass to a maximum height of 5 cm.
<b>Element 3: Vehicular access</b>	A3.1 Public roads	Robertson Road currently provides one temporary access option that facilitates movement to a range of alternative locations and directions of travel as an interim measure. Robertson Road will eventually be extended and connect to Orton Road and the subdivision will then be compliant.
	A3.2a Multiple access routes	There is a no-through road in the area that is established at this stage of the development. The Robertson Road is greater than 200 metres in length and is not wholly within BAL-LOW.
	A3.2b Emergency access way	Not applicable.
	A3.3 Through-roads	Not applicable.
	A3.4a Perimeter roads	Not applicable.
	A3.4b Fire service access routes	There are no planned FSAR at this stage of the development within the area.
	A3.5 Battle-axe access legs	There will be no battle-axe access legs within this development.
	A3.6 Private driveways	Driveways may exceed 70 metres in length and if so will comply with the Guidelines.
<b>Element 4: Water</b>	A4.1 Identification of future water supply	The site will be serviced with reticulated mains water in accordance with the State Government requirements.
	A4.2 Provision of water for firefighting purposes	The site will be serviced with reticulated mains water and hydrants will be placed in accordance with the State Government requirements.

**Subsection 5.2: Additional management strategies**



**Figure 11.** Spatial representation of bushfire management strategies.

<b>Section 6: Responsibilities for Implementation and Management of the Bushfire Measures</b>
---

<b>DEVELOPER/LANDOWNER – PRIOR TO SALE OR OCCUPANCY</b>	
<b>No.</b>	<b>Implementation Action</b>
1	A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i> is to be placed on the certificate(s) of title of the proposed lot(s) that are declared as bushfire prone, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:  <i>"This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land."</i> (Western Australian Planning Commission)
2	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.
3	Connect to the scheme water system.
4	Ensure compliance with the Guidelines access requirements.

<b>LANDOWNER/OCCUPIER – ONGOING MANAGEMENT</b>	
<b>No.</b>	<b>Management Action</b>
1	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

## Appendix 1

Access external to the development site that shows there is only one access option to alternative destinations.



## Appendix 2

### Environmentally sensitive areas map.



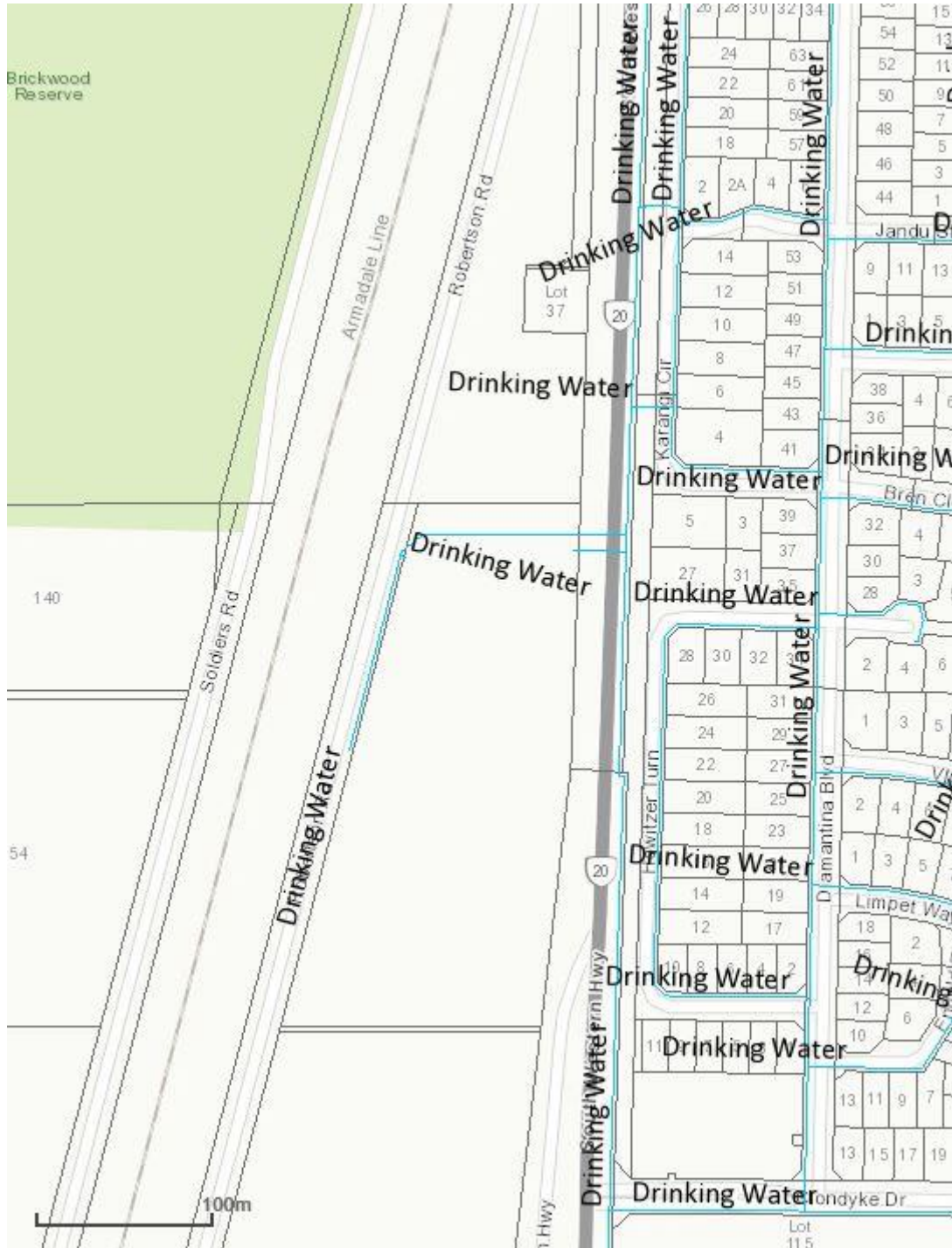
### Appendix 3

Current hydrant location map.



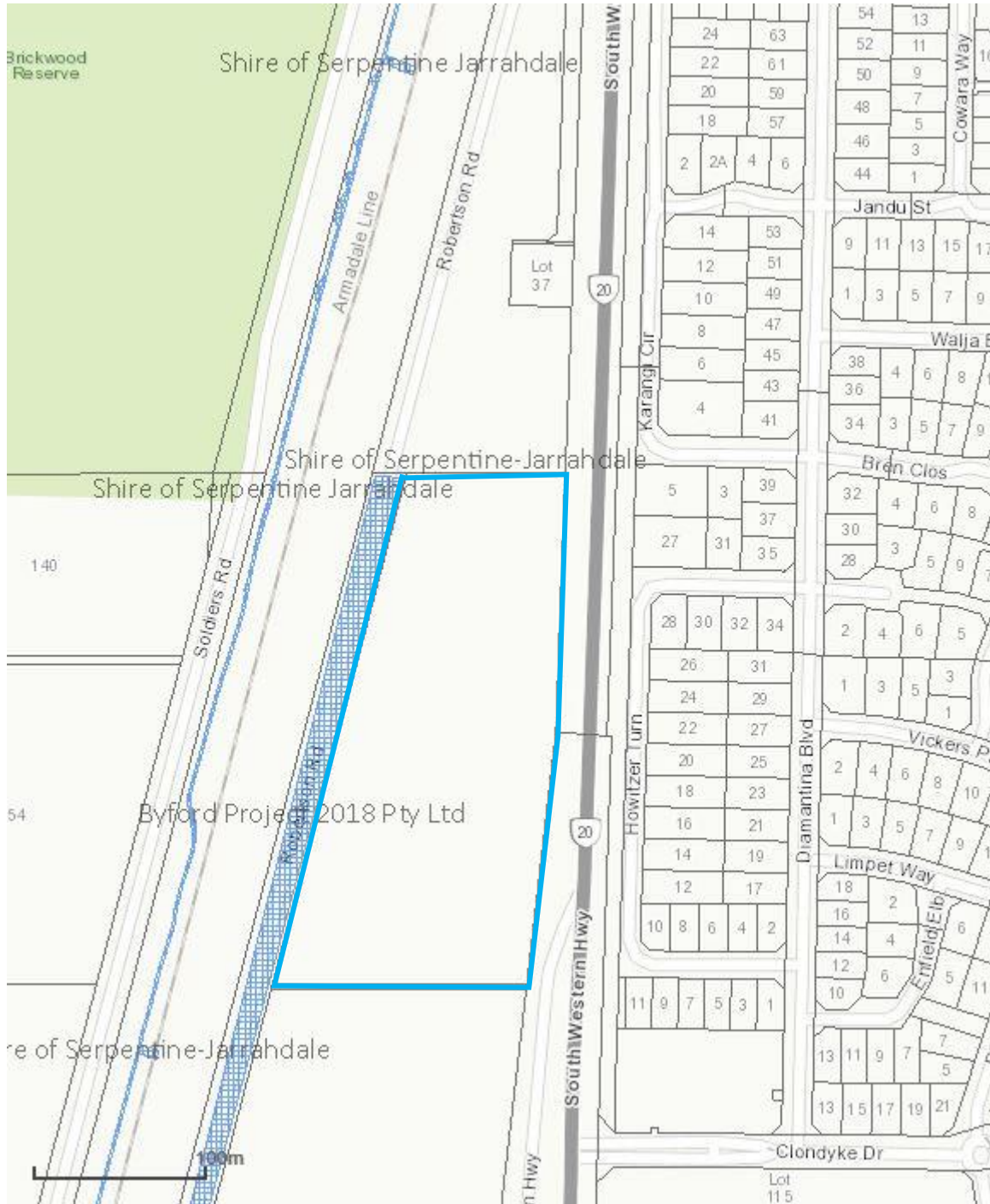
### Appendix 4

Current drinking water pipeline.



**Appendix 5**

Clearing instrument applied for but not approved. This is not on the lot but within the road reserve.





## References

Australian Building Codes Board, (2019). *Building Code of Australia*. Australian Building Codes Board, Sydney.

Near map from <http://maps.au.nearmap.com/>

Contour map from <https://maps.agric.wa.gov.au/nrm-info/>

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<https://espatial.dplh.wa.gov.au/PlanWA/Index.html?viewer=PlanWA>

Department of Environmental Protection. (2000). *Bush Forever Volume 2 Directory of Bush Forever Sites*, Department of Environmental Protection, Perth.



Harley Dykstra<sup>®</sup>

PLANNING & SURVEY SOLUTIONS

APPENDIX E  
**TRAFFIC IMPACT  
STATEMENT**

# TRANSPORT IMPACT STATEMENT

Lot 128 (Lot 4) Robertson Road

Byford

December 2022

Rev C



**Transport Impact Statement**  
**KC01510.000 Lot 128 Robertson Road, Byford**

**HISTORY AND STATUS OF THE DOCUMENT**

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Rev A Draft	10.11.2022	M Kleyweg	M Kleyweg	10.11.2022	Issued for Review
Rev A	13.12.2022	M Kleyweg	M Kleyweg	14.12.2022	Issued for Review
Rev B	15.12.2022	M Kleyweg	M Kleyweg	15.12.2022	Amended as per comments
Rev C	16.12.2022	M Kleyweg	M Kleyweg	16.12.2022	Amended as per comments

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<b>Document Version</b>	KC01510.000_R01_ Rev C

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# Appendices

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**Appendix 1** - The layout of the proposed development

**Appendix 2** - Transport Planning and Traffic Plans

**Appendix 3** - Vehicle Turning Circle Plans

**Prepared by:**

**ABN**

**Postal address:**

**Website:**

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www.kctt.com.au |

## 1. Executive Summary

### Site Context

- The subject site is located on a vacant portion of Lot 128 Robertson Road, Byford which is to be subdivided. The subject site will be Freehold Lot 4 once finalised.
- The proposed land use is a community space and a place of worship with a maximum capacity of 300 people with direct access on to Robertson Road.
- While there are two proposed uses, Community Purpose & Place of Worship, both uses have similar impacts and will not operate concurrently of each other, therefore it was considered acceptable to assess the site on the 'Community Purpose' use only.
- Robertson Road is currently under construction and will connect to South Western Highway via a new section - Road 01. Ultimately Robertson Road will connect to Cardup Siding Road to the south, however the timeline is unknown at the time. Therefore, the traffic impact analysis is restricted to the established network access points.

### Technical Findings

- The proposed development would generate an additional 60 vehicular trips per day and 20 vehicular trips in the peak hours on weekdays and 150 vehicular trips per day, and 75 vehicular trips during peak hours on weekends. This is considered moderate impact on the surrounding road network according to WAPC Guidelines.
- Keeping in mind the classification of surrounding roads, KCTT believes that the road network can successfully absorb the added traffic volumes.

### Relationship with Policies

- According to the TPS No. 2, the proposed development requires 79 parking bays. The proposed plans show 50 standard parking bays and 1 accessible parking bay. This equates to 28 parking bays shortfall. The proposed number of parking bays is expected to be able to accommodate day-to-day operations. The neighbouring Automasters to the north is willing to enter a shared reciprocal parking agreement with the subject site, as its peak times do not operate concurrently with the proposed use. Some patrons are also expected to arrive on foot from the residential area located just east of South Western Highway or using one of the three bus routes within the 400m radius.
- Due to the potential of a shared parking agreement with the Automasters, all parking can be accommodated on-site, and therefore there is no parking shortfall.
- Proposed parking bays are dimensioned in accordance with relevant standards. The aisle widths provided throughout the parking area exceed those stipulated in AS2890.1:2004. Therefore, there are no need for increased aisle lengths at end bays.
- As seen from the swept paths in Appendix 3 the parking area is fully navigable by B99 Passenger Vehicle 5.2m. Additionally, the swept path drawing for Service Vehicle 8.8m shows that the vehicle can safely turnaround within the parking area if required.
- The plans for the proposed development show 12 bicycle parking racks and end of trips facilities including an accessible shower.
- Building Code of Australia ACROD Provision – The plans for the proposed development show one accessible parking bay as required.

**Transport Impact Statement**  
KC01510.000 Lot 128 Robertson Road, Byford

## **Conclusion**

- As stated above the additional traffic attracted to the subject site is expected to be 60 vehicular trips per day and 20 vehicular trips in the peak hours on weekdays and 150 vehicular trips per day, and 75 vehicular trips during peak hours on weekends (if the facility operates at full legal capacity).
- South Western Highway is classified as Primary Distributor as per MRWA classification carrying high traffic volumes currently between 6,500 and 11,000 vehicles per day. Therefore, the added traffic from the subject site can be considered negligible.
- Robertson Road is planned to accommodate traffic volumes from Local Structure Plan - Lots 1, 3 & 128 South Western Highway, Byford including the traffic from the subject site.
- Other surrounding roads would absorb significantly less traffic than Robertson Road and South Western Highway.
- In summary KCTT believe that the proposed development will not have a negative impact on the surrounding road network.

**Transport Impact Statement**  
 KC01510.000 Lot 128 Robertson Road, Byford

## 2. Transport Impact Statement

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### 2.1 Location

Lot Number	128 (Lot 4)
Road Name	Robertson Road
Suburb	Byford
Description of Site	The subject site is located on a vacant portion of Lot 128 Robertson Road, Byford which is to be subdivided. The subject site will be Freehold Lot 4 once finalised. The proposed land use is a community space and a place of worship with a maximum capacity of 300 people with direct access on to Robertson Road. Robertson Road is currently under construction and will connect to South Western Highway via a new section - Road 01. Ultimately Robertson Road will connect to Cardup Siding Road to the south, however the timeline is unknown at the time. Therefore, the traffic impact analysis is restricted to the established network access points.

### 2.2 Technical Literature Used

Local Government Authority	Shire of Serpentine-Jarrahdale
Type of Development	Community purpose
Are the R-Codes referenced?	NO
Is the NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation / attraction rates for various land uses) referenced?	YES
Which WAPC Transport Impact Assessment Guideline should be referenced?	Volume 4 - Individual Developments Volume 5 - Technical Guidance
Are there applicable LGA schemes for this type of development?	YES Town Planning Scheme No. 2 DRAFT Local Planning Scheme No. 3
Are Austroads documents referenced?	YES
Is the Perth Transport Plan for 3.5 million and Beyond referenced?	NO



**Transport Impact Statement**  
**KC01510.000 Lot 128 Robertson Road, Byford**

## 2.3 Land Uses

Are there any existing Land Uses NO

### Proposed Land Uses

How many types of land uses are proposed? While there are two proposed uses, Community Purpose & Place of Worship, both uses have similar impacts and will not operate concurrently of each other, therefore it was considered acceptable to assess the site on the 'Community Purpose' use only.

Nominate land use type and yield  
 Community Purpose– 1,109m<sup>2</sup>

- Auditorium (Church)– 540m<sup>2</sup>
- Multipurpose (Kids 1,2,3) – 212m<sup>2</sup>
- Office – 20m<sup>2</sup>

Initial proposed hours/capacity will be approximately as follows:

- Sunday Morning service - 150 people (approximately)
- Friday night youth program - 30 young people
- Mums Playgroup (Fortnightly) - around 25 people
- Daytime administration use - around 5-10 people.
- All other days hours (8AM – 10PM) subject to facility hire with a maximum capacity of 300 people

Are the proposed land uses complementary with the surrounding land-uses? YES

## 2.4 Local Road Network Information

How many roads front the subject site? 1

*Name of Roads Fronting Subject Site / Road Classification and Description:*

Road Name	Robertson Road
Number of Lanes	two way, one lane (no linemarking), undivided
Road Reservation Width	20m
Road Pavement Width	9m
Classification	This section of Robertson Road does not have MRWA classification
Speed Limit	This section of Robertson Road does not have a set speed limit – assumed 50kph
Bus Route	NO
On-street parking	YES – to be provided

*Name of Other Roads within 400m radius of site, or roads likely to take increased traffic due to the development.*

Road Name	South Western Highway
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	varies 30m-60m
Road Pavement Width	9m
Classification	Primary Distributor
Speed Limit	varies 60kph – 110kph
Bus Route	YES
<i>If YES Nominate Bus Routes</i>	251, 252, 253
On-street parking	NO

**Transport Impact Statement**

KC01510.000 Lot 128 Robertson Road, Byford

<b>Road Name</b>	<b>Cardup Siding Road</b>
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	20m
Road Pavement Width	6.5m
Classification	Access Road
Speed Limit	60kph
Bus Route	YES
<i>If YES Nominate Bus Routes</i>	252, 253
On-street parking	NO
<b>Road Name</b>	<b>Soldiers Road</b>
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	20m
Road Pavement Width	7m
Classification	Regional Distributor
Speed Limit	varies 60kph – 80kph
Bus Route	YES
<i>If YES Nominate Bus Routes</i>	252, 253
On-street parking	NO

**2.5 Traffic Volumes**

<b>Road Name</b>	<b>Location of Traffic Count</b>	<b>Vehicles Per Day (VPD)</b>	<b>Vehicles per Peak Hour (VPH)</b>				<b>Heavy Vehicle %</b>	<b>Date of Traffic Count</b>	<i>If older than 3 years multiply with a growth of 2% per annum rate to the year of 2022</i>
			AM Peak Time	AM Peak - Peak VPH	PM Peak Time	PM Peak - Peak VPH			
South Western Highway	South of Nettleton Road	11,447	08:00 – 959		15:00 – 1,137		18.0%	2020/2021	-
	South of Kiln Road	6,901	08:00 – 577		15:15 – 671		23.3%	2020/2021	-
Soldiers Road	Between Karbo Drive & Bishop Road*	3,012	10:00 – 219		15:00 – 247		10.8%	Dec 2020	-
	790m north of Cardup Siding Road*	2,676	08:00 – 281		15:00 – 294		<i>N/A – HV not likely to be in higher volumes than generally expected</i>	Nov 2017	2,954
	North of Cardup Siding Road*	N/A	07:00 – 117		15:00 – 326		<i>N/A – HV not likely to be in higher volumes than generally expected</i>	Aug 2018	N/A
	South of Cardup Siding Road*	N/A	07:00 – 152		15:00 – 340		<i>N/A – HV not likely to be in higher volumes than generally expected</i>	Aug 2018	N/A

## Transport Impact Statement

KC01510.000 Lot 128 Robertson Road, Byford

Cardup Siding Road	Cardup Siding Road – Eastern end*	2,563	8:00 – 172	15:00 – 222	12.1%	Dec 2020	-
	West of Soldiers Road*	N/A	07:00 – 82	15:00 – 58	<i>N/A – HV not likely to be in higher volumes than generally expected</i>	Aug 2018	N/A
	East of Soldiers Road*	N/A	07:00 – 127	15:00 – 228	<i>N/A – HV not likely to be in higher volumes than generally expected</i>	Aug 2018	N/A

Note \* - KCTT have received these traffic counts from the Shire of Serpentine Jarrahdale for an earlier project at the same location.

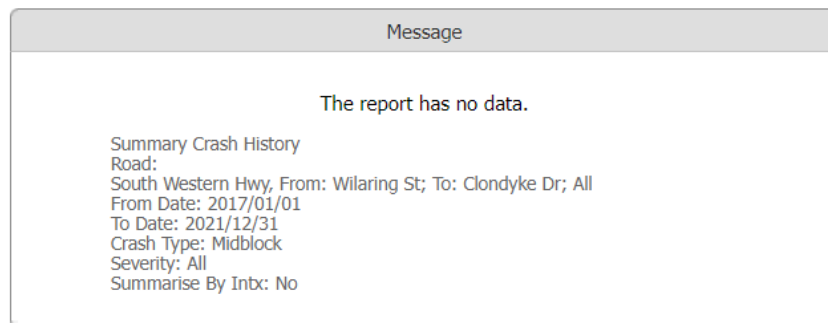
## 2.6 Vehicular Crash Information

Is Crash Data Available on Main Roads WA website? YES

If YES, nominate important survey locations:

Location 1 South Western Highway SLK[9.19-10.04] – no crashes

Period of crash data collection 01/01/2017 – 31/12/2021



## 2.7 Vehicular Parking

Local Government Shire of Serpentine-Jarrahdale

Local Government Document Utilised Town Planning Scheme No. 2  
DRAFT Local Planning Scheme No. 3

Description of Parking Requirements in accordance with Scheme:

Town Planning Scheme No. 2

*Club Premises - 1 space per 4 persons accommodated*

DRAFT Local Planning Scheme No. 3

*Community Purpose - 1 bay for every 4 persons accommodated at maximum occupancy and 1 bay per employee  
1 bay per employee means 1 bay for each of the maximum number of employees on the premises at any given time.*

### Calculation of Parking

Land Use	Requirements	Yield	Total Parking
Community Purpose	1 / 4 persons + 1/employee	300 people capacity 4 employees	79
<b>Total Car Parking Requirement</b>			<b>79</b>
<b>Total Volume of Parking Provided by Proponent</b>			<b>50 standard bays 1 ACROD bay</b>

## Transport Impact Statement

KC01510.000 Lot 128 Robertson Road, Byford

### Justification

According to the TPS No. 2, the proposed development requires 79 parking bays. The proposed plans show 51 parking bays. This equates to 28 parking bays shortfall.

The proposed number of parking bays is expected to be able to accommodate day-to-day operations. The neighbouring Automasters to the north is willing to enter a shared reciprocal parking agreement with the subject site, as its peak times do not operate concurrently with the proposed use.

Some patrons are also expected to arrive on foot from the residential area located just east of South Western Highway or using one of the three bus routes within the 400m radius.

Due to the potential of a shared parking agreement with the Automasters, all parking can be accommodated on-site, and therefore there is no parking shortfall.

## 2.8 Compliance with AS2890.1:2004 and AS2890.6

Number of Parking Bays on-site 51

Are Austroads documents referenced? YES

If YES, *Nominate*:

- Australian/New Zealand Standard, Parking facilities, Part 1: Off-street car parking – Originated as AS 2890.1—1986.
- Australian/New Zealand Standard, Parking facilities, Part 6: Off-street parking for people with disabilities – Originated as AS2890.6

Proposed development User Class User Class 1A (Residential, domestic and employee parking)  
User Class 3 (visitors' parking)  
User Class 4 (Parking for people with disabilities)

AS2890.1:2004 Off-street car parking AS2890.6 Off-street parking for people with disabilities						
Parking Bay Type	Parking Bay Length		Parking Bay Width		Aisle Width	
	Required	Proposed	Required	Proposed	Required	Proposed
All bays at 90° (User Class 1A)	5.4m	5.4m	2.4m	2.4m	5.8m	6.0m- 6.125m
All bays at 90° (User Class 3)	5.4m	5.4m	2.6m	2.4m	5.8m	6.0m- 6.125m
ACROD Parking	5.4m	5.4m	2.4m—ACROD 2.4m—shared space	2.4m	5.8m	-

Name the other requirements in the AS2890.1:2004 document.

Single-sided aisles	All of the aisles exceed minimum requirement prescribed by AS2890.01
Blind aisle	Extended by a minimum of 1 m
Reversing bay	Not provided

## Transport Impact Statement

KC01510.000 Lot 128 Robertson Road, Byford

Have Vehicle Swept Paths been checked for Parking? YES

If YES, provide description of performance:

As seen from the swept paths in Appendix 3 the parking area is fully navigable by B99 Passenger Vehicle 5.2m.

Additionally, the swept path drawing for Service Vehicle 8.8m shows that the vehicle can safely turnaround within the parking area if required.

Please refer to the swept path analysis drawings in Appendix 3.

## 2.9 Bicycle Parking

Local Government

Shire of Serpentine-Jarrahdale

Reference Document Utilised

Local Planning Policy 4.15: Bicycle Facilities Policy

DRAFT Local Planning Scheme No. 3

Description of Parking Requirements in accordance with Scheme:

Local Planning Policy 4.15: Bicycle Facilities Policy

Land Use	Minimum Requirement				Preferred			
	Long Term Parking (Employee Resident Spaces)	Class	Short Term Parking (Visitor/Shopper spaces)	Class	Long Term Parking (Employee /Resident Spaces)	Class	Short Term Parking (Visitor/Shopper Spaces)	Class
Community Centre/ Civic Buildings	1 space per 1500m <sup>2</sup> NLA	2	2 spaces +1 additional space per 1500m <sup>2</sup> NLA	3	1 space per 150m <sup>2</sup> NLA	2	1 space per 75m <sup>2</sup> NLA	3

DRAFT Local Planning Scheme No. 3

Community Purpose 1 bay per 500m<sup>2</sup>.

Place of worship 1 bay per 40m<sup>2</sup>

### Parking Requirement in accordance with regulatory documents

Land Use	Yield	Total Bicycle Parking requirement			
		Minimum Long-term Parking	Preferred Long-term Parking	Minimum Short-term Parking	Preferred Short-term Parking
Community Purpose	1,109m <sup>2</sup>	1	8	3	15

**Total Volume of Bicycle Parking Provided by Proponent**

**12 racks**

### Justification

The plans for the proposed development show 12 bicycle parking racks and end of trips facilities including an accessible shower.

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 KC01510.000 Lot 128 Robertson Road, Byford

## 2.10 ACROD Parking

Class of Building Class 9b – an assembly building

Does this building class require specific provision of ACROD Parking? YES

Reference Document Utilised Building Code of Australia

Description of Parking Requirements:

Class 9b — (b) Other assembly building — (i) up to 1000 carparking spaces; - 1 space for every 50 carparking spaces or part thereof

### Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Community Purpose	1 space for every 50 carparking spaces or part thereof	50	1
<b>Total Volume of ACROD Parking Required</b>			<b>1</b>
<b>Total Volume of ACROD Parking Provided by Proponent</b>			<b>1</b>

Justification

The plans for the proposed development show one accessible parking bay as required.

## 2.11 Delivery and Service Vehicles

Guideline Document used as reference NSW RTA Guide to Traffic Generating Developments

Requirements

Other uses - 1 space per 2,000m<sup>2</sup>

### Parking Requirement in accordance with regulatory documents

Land Use	Minimum Requirements	Yield	Total Parking
Public Assembly Community Hub	1 space per 2,000m <sup>2</sup>	1,109m <sup>2</sup>	1
<b>Total Volume of Service and Delivery Parking Required</b>			<b>1</b>
<b>Total Volume of Service and Delivery Parking Provided by Proponent</b>			<b>N/A</b>

Justification

Having in mind that the service vehicle can safely navigate through the proposed parking area a set down bay is not required.

**2.12 Calculation of Development Generated / Attracted Trips**

What are the likely hours of operation?

Church – 09:00-21:00.

Initial proposed hours/capacity will be approximately as follows:

- Sunday Morning service - 150 people (approximately)
- Friday night youth program - 30 young people
- Mums Playgroup (Fortnightly) - around 25 people
- Daytime administration use - around 5-10 people.
- All other days hours (8AM – 10PM) subject to facility hire with a maximum capacity of 300 people

What are the likely peak hours of operation?

Weekday - Friday night youth program

Weekends – Sunday service 09:00 - 14:00.

Do the development generated peaks coincide with existing road network peaks?

NO

Guideline Document Used

Transportation Engineers (ITE) Common Trip Generation Rates (9th edition)

Rates from above document:

**Recreational Community Centre:**

- Daily - 33.82 VPD/ KSF2 = 36.4 VPD/m2
- AM peak - 2.05 VPH/ KSF2 = 2.21 VPH/ m2
- PM peak - 2.74 VPH/ KSF2 = 2.95 VPH/ m2

As the rates provided for community purposes in the ITE Manual are marked to be used with caution due to the small sample sizes, KCTT derived their rate based on previous experience on similar projects.

Events such as weddings, celebrations, funerals, special services etc., will be the most significant traffic attractor and will be mostly held on weekends. On average, there would be around 4 persons per vehicle on weekends and special events, given many families that would be attending with a maximum attendance of 300 people.

On weekdays it is expected that the number of persons per vehicle would be lower. Therefore, an average of 1.5 persons per vehicle is assumed since people would attend in smaller groups. Additionally, maximum attendance on weekdays as per received information from the client will likely be around 30 visitors and 10 employees. Employees are expected to arrive each in their own vehicle outside of peak hours.

Visitors and employees would make one vehicular trip entering the subject site and one vehicular trip leaving the subject site. A directional split of 50%IN/50% OUT for both the AM and PM peak is adopted.

Land Use Type	Rate above	Yield	Daily Traffic Generation	Peak Hour Traffic Generation
<b>Weekdays</b>				
Community Purpose	2 VPD / 1.5 visitors + 2 VPD/employee 1 VPH / 1.5 visitors	30 visitors 10 employees	60	20
<b>Total traffic on weekdays</b>			<b>60</b>	<b>20</b>
<b>Weekends</b>				
Community Purpose	2 VPD / 4 persons 1 VPH / 4 persons	300 people	150	75
<b>Total traffic on weekends</b>			<b>150</b>	<b>75</b>

**Transport Impact Statement**

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Does the site have existing trip generation / attraction?	NO
What is the total impact of the new proposed development?	The proposed development would generate an additional 90 vehicular trips per day and 45 vehicular trips in the peak hours on weekdays and 150 vehicular trips per day, and 75 vehicular trips during peak hours on weekends. This is considered moderate impact on the surrounding road network according to WAPC Guidelines.  Keeping in mind the classification of surrounding roads, KCTT believes that the road network can successfully absorb the added traffic volumes.

**2.13 Traffic Flow Distribution**

How many routes are available for access / egress to the site?	2 routes
--	----------

**Route 1 / Movement 1**

Provide details for Route No 1	To/from the north via Robertson Road-Road 01-South Western Highway
Percentage of Vehicular Movements via Route No 1	75%

**Route 2 / Movement 2**

Provide details for Route No 2	To/from the south via Robertson Road-Road 01-South Western Highway
Percentage of Vehicular Movements via Route No 2	25%

Note – A shift in traffic flow can be expected once Robertson Road is fully constructed and linked to Cardup Siding Road. For more detailed plans of the estimated vehicular traffic volumes and distribution please refer to the plans provided in Appendix 2.

**2.14 Vehicle Crossover Requirements**

Are vehicle crossovers required onto existing road networks?	YES
How many existing crossovers?	None
How many proposed crossovers?	One crossover on to Robertson Road
Are sightlines adequate?	Since Robertson Road is expected to be classified as Access Road with a speed limit of 50km/h a desirable 5s gap sight distance of 69m and a minimum of stopping sight distance of 45m is warranted.  The desirable 69m sight distance is expected to be achieved at proposed crossover.  Sight triangles of 2.0x2.5m should be provided at crossovers for pedestrian sightlines.
How close are proposed crossovers to existing intersections?	Approximately 250m from the proposed intersection of Road 01 and South Western Highway
Does this meet existing standards?	YES



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 KC01510.000 Lot 128 Robertson Road, Byford

**Justification**

According to AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking a driveway should be located a minimum 6m from the intersection curve. Therefore, the proposed crossover is in accordance with the set-out requirements.

**Are auxiliary lanes warranted?**

Both left turn and right turn deceleration lane will be provided on the intersection of South Western Highway and Road 01 as part of Local Structure Plan - Lots 1, 3 & 128 South Western Highway, Byford.

**2.15 Public Transport Accessibility**

How many bus routes are within 400 metres of the subject site? **3**  
 How many rail routes are within 800 metres of the subject site? **None**

Bus Route	Description	Peak Frequency	Off-Peak Frequency
251	Armadale Station – Byford via South Western Highway	4 times a day	3 times a day on Saturdays <i>No Sunday &amp; Public Holidays service</i>
252	Armadale Station – Mundijong via Byford	30 minutes	3 times a day <i>No Sunday &amp; Public Holidays service</i>
253	Armadale Station – Jarrahdale via Byford & Mundijong	4 times a day	once a day <i>No Sunday &amp; Public Holidays service</i>

**Walk Score Rating for Accessibility to Public Transport**

26 | Some Transit. A few nearby public transportation options.

**Is the development in a Greenfields area?** **YES**

In recent years the surrounding area has undergone a major transformation from generally rural to sub-urban area. It is expected that as urban development continues that the local bus services will be extended. There is a possible future bus route planned to run through Soldiers Road and Turner Road west of the subject site.

Byford Train Station is currently located approximately 1km to the north of the subject site serviced by Australind regional rail service. Byford Rail Extension METRONET project includes construction of a new ground level Byford Station within the future Byford Town Centre, approximately 400 metres north of Abernethy Road, Byford. To improve safety and connections in the area, and improve traffic flow, the Thomas Road level crossing will be reconfigured to a road-overrail bridge. Options are still being considered for the other existing level crossings. The regional Australind rail service will continue to stop at Armadale Station using a new dedicated platform. Final arrangements in Byford are still to be determined during the next stages of design.



**Transport Impact Statement**  
**KC01510.000 Lot 128 Robertson Road, Byford**

## 2.16 Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:

**Classification**

**Road Name**

*Unclassified pedestrian path*

Diamantina Boulevard, Barraberry Way, Cowara Way, Jandu Street, Walja Bend, Bren Close, Quilberon Link, Vickers Pass, Benalla Crescent, Magazine Link, Mortar Pass, Clondyke Drive

Does the site have existing pedestrian facilities

NO

Does the site propose to improve pedestrian facilities?

YES – pedestrian path is proposed on Robertson Road. The footpath will for the time being remain unconnected to the regional footpaths and only serve to link the street parking with the entries of Lots 2 & 3 along Robinson Road.

What is the Walk Score Rating?

10 | Car-Dependent. Almost all errands require a car.

## 2.17 Cyclist Infrastructure

Are there any PBN Routes within an 800m radius of the subject site?

NO

Are there any PBN Routes within a 400m radius of the subject site?

NO

Does the site have existing cyclist facilities?

NO

Does the site propose to improve cyclist facilities?

NO - The plans for Stage 2 (Lot 2 & 3) subdivision of Lot 128 show provision of bicycle parking spaces complying with set out requirements.

## 2.18 Site-Specific Issues and Proposed Remedial Measures

How many site-specific issues need to be discussed?

One

**Site-Specific Issue No 1**

Parking provision

Remedial Measure / Response

According to the TPS No. 2, the proposed development requires 79 parking bays. The proposed plans show 51 parking bays. This equates to 28 parking bays shortfall.

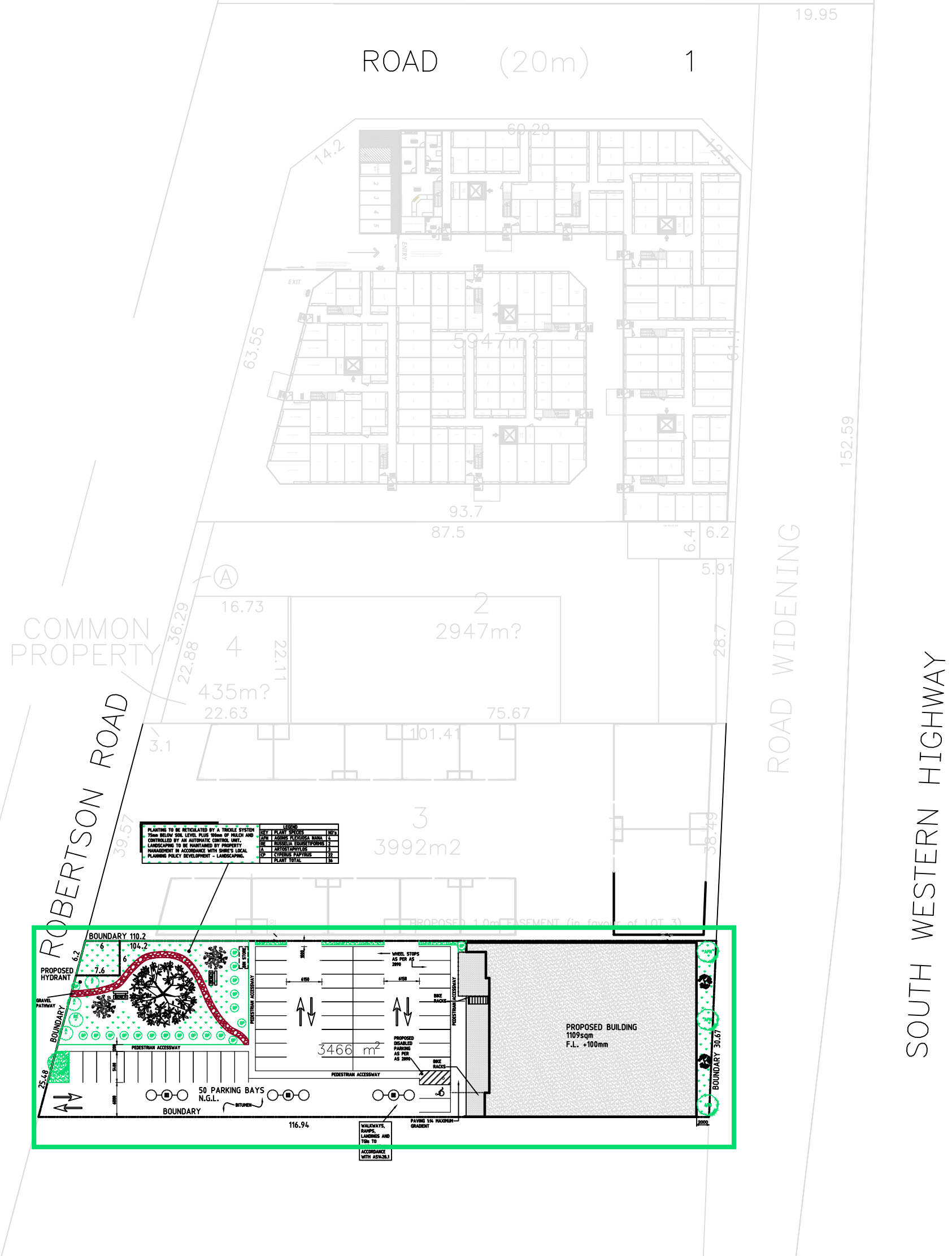
The proposed number of parking bays is expected to be able to accommodate day-to-day operations. The neighbouring Automasters to the north is willing to enter a shared reciprocal parking agreement with the subject site, as its peak times do not operate concurrently with the proposed use.

Some patrons are also expected to arrive on foot from the residential area located just east of South Western Highway or using one of the three bus routes within the 400m radius.

Due to the potential of a shared parking agreement with the Automasters, all parking can be accommodated on-site, and therefore there is no parking shortfall.

# **Appendix 1**

## **The Layout of the Proposed Development**



PLANTING TO BE RETICULATED BY A TRICOLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF POLYCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY DEVELOPMENT - LANDSCAPING.

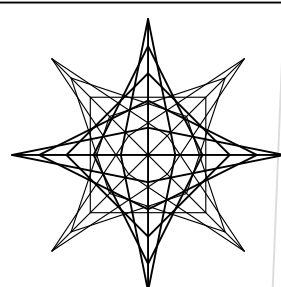
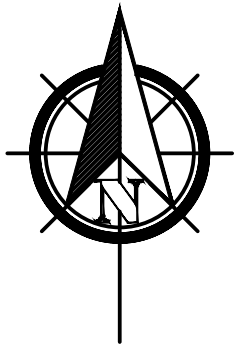
PLANT SPECIES	NO.
ACACIA PLEUROCARPA NANA	1
ACACIA ROBINSONIANA	2
ACACIA SP.	2
CEPHEUS PAPYRUS	22
<b>PLANT TOTAL</b>	<b>27</b>

STAGE 2

128  
1.3174ha

**KEY PLAN**

SCALE NTS  
LOT 4 ROBERTSON ROAD BYFORD



CLIENT <b>CENTREPOINT HUB - BYFORD CAMPUS</b>		<table border="1"> <tr> <td>Rev.</td> <td>Date</td> <td>Comment</td> </tr> <tr> <td>A</td> <td>31.1.2022</td> <td>ISSUE FOR COMMENT</td> </tr> <tr> <td>B</td> <td>23.5.2022</td> <td>DEVELOPMENT APPROVAL</td> </tr> </table>	Rev.	Date	Comment	A	31.1.2022	ISSUE FOR COMMENT	B	23.5.2022	DEVELOPMENT APPROVAL			
Rev.	Date		Comment											
A	31.1.2022		ISSUE FOR COMMENT											
B	23.5.2022		DEVELOPMENT APPROVAL											
Project <b>PROPOSED PUBLIC ASSEMBLY COMMUNITY HUB LOT 128 (LOT 4) ROBERTSON ROAD BYFORD WA</b>		<table border="1"> <tr> <td>Rev.</td> <td>B</td> <td>Job No.</td> </tr> <tr> <td>Drawn</td> <td>PAH</td> <td><b>577-1</b></td> </tr> <tr> <td>Date</td> <td>JANUARY 2022</td> <td></td> </tr> <tr> <td>Scale</td> <td>AS SHOWN</td> <td>Sheet 1 OF 5</td> </tr> </table>	Rev.	B	Job No.	Drawn	PAH	<b>577-1</b>	Date	JANUARY 2022		Scale	AS SHOWN	Sheet 1 OF 5
Rev.	B	Job No.												
Drawn	PAH	<b>577-1</b>												
Date	JANUARY 2022													
Scale	AS SHOWN	Sheet 1 OF 5												
Title <b>PROPOSED KEY PLAN</b>														

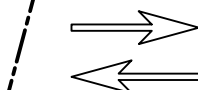
ROBERTSON

BOUNDARY 110.2

PROPOSED HYDRANT

GRAVEL PATHWAY

BOUNDARY



BOUNDARY

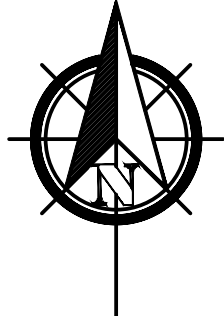
PARKING BAYS	50
AUDITORIUM	300 SEATS
BUILDING FOOTPRINT	1109sqm
LANDSCAPING	670sqm
LAND	3466sqm
CLASS	9A PUBLIC ASSEMBLY
ZONE	MIXED BUSINESS / SERVICE COMMERCIAL

<b>SOAKWELLS</b>	
6 No. CONCRETE SOAKWELLS	1800 x 1800mm
3 No. CONCRETE SOAKWELLS	1800 x 1800mm WITH GRATES
ALL TO HAVE TRAFFICABLE CONCRETE LIDS	

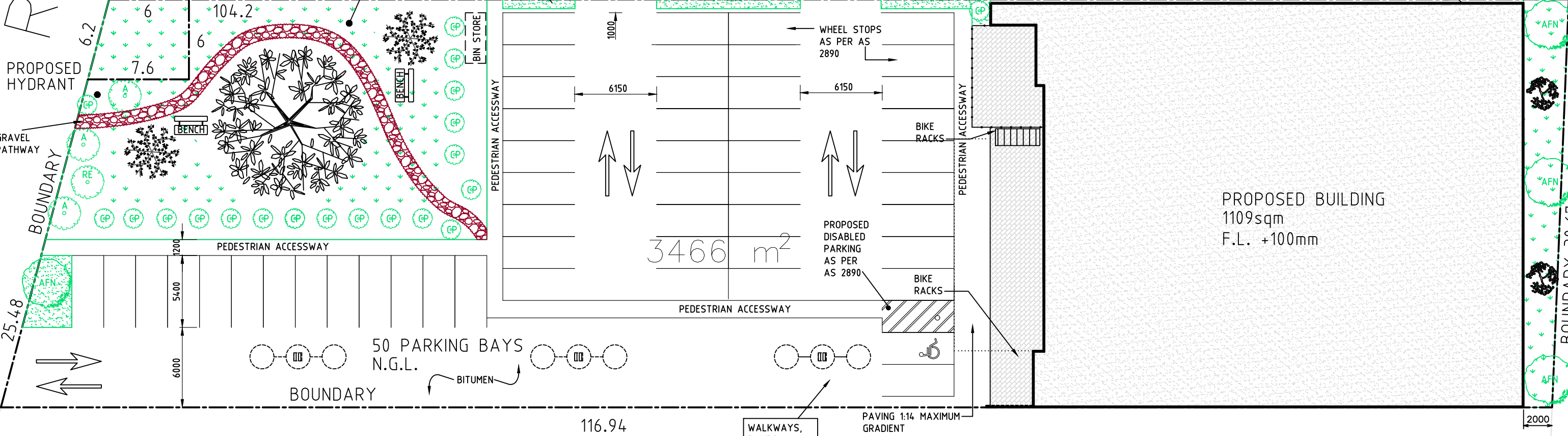
LEGEND		
KEY	PLANT SPECIES	NO's
AFN	AGONIS FLEXUOSA NANA	4
RE	RUSSELLIA EQUISETIFORMIS	2
A	ARTOSTAPHYLOS	3
CP	CYPERUS PAPHYRUS	22
PLANT TOTAL		36

PLANTING TO BE RETICULATED BY A TRICKLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF MULCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY DEVELOPMENT - LANDSCAPING.

3  
3992m<sup>2</sup>



PROPOSED 1.0m EASEMENT (in favour of LOT 3)

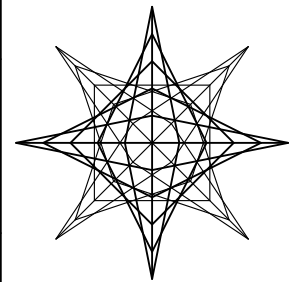


**SITE PLAN**

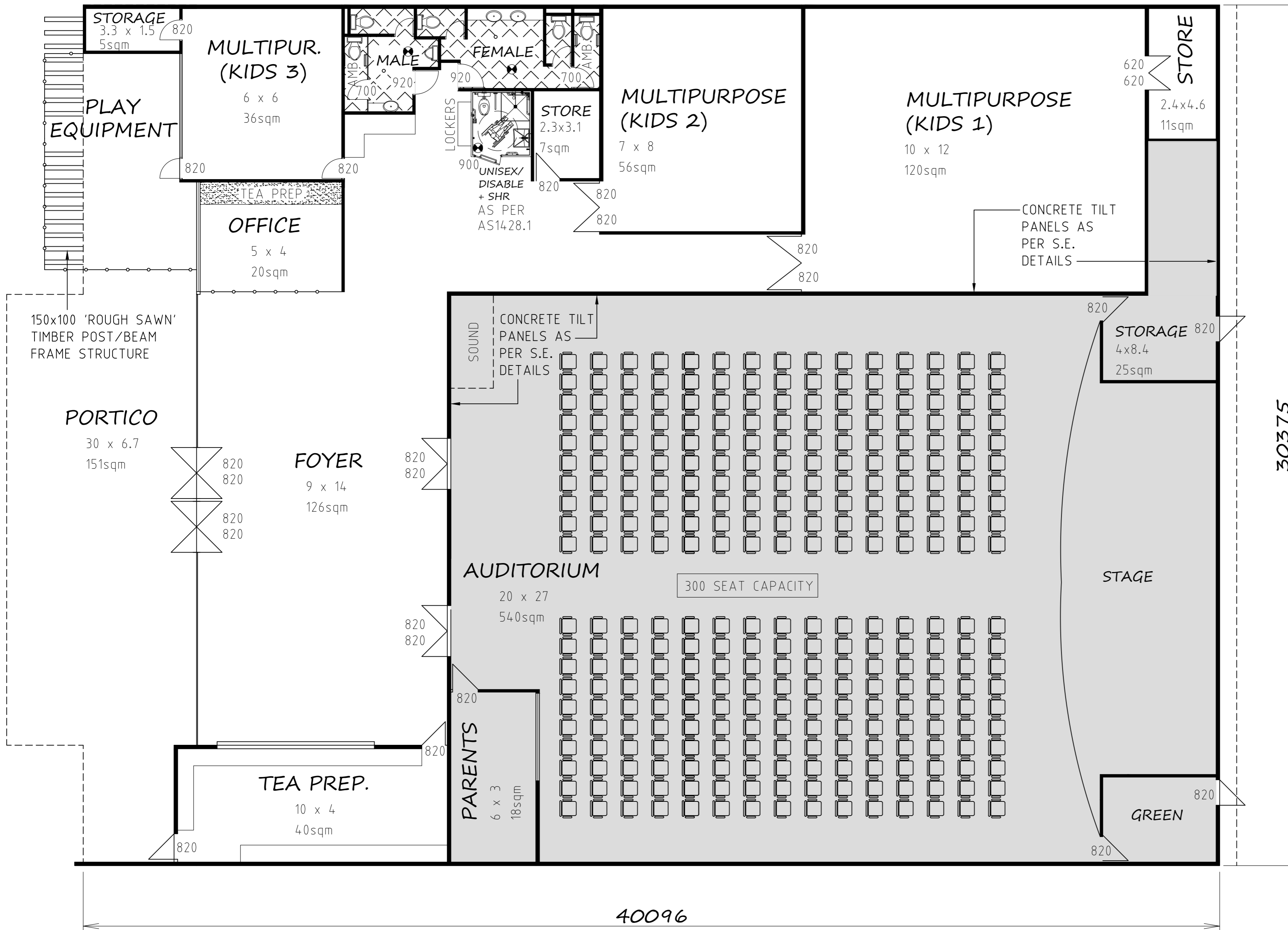
SCALE 1:300  
LOT 4 ROBERTSON ROAD BYFORD



CLIENT	<b>CENTREPOINT HUB - BYFORD CAMPUS</b>
Project	<b>PROPOSED PUBLIC ASSEMBLY COMMUNITY HUB</b>
	<b>LOT 128 (LOT 4) ROBERTSON ROAD BYFORD WA</b>
Title	<b>PROPOSED SITE LOCATION</b>



Rev.	Date	Comment
A	31.1.2022	ISSUE FOR COMMENT
B	23.5.2022	DEVELOPMENT APPROVAL
Rev.	B	Job No.
Drawn	PAH	<b>577-2</b>
Date	JANUARY 2022	Sheet 2 OF 5
Scale	AS SHOWN	



# FLOOR PLAN

SCALE 1:100

LOT 4 ROBERTSON ROAD BYFORD  
3of5 (A2 SHEET)



75x300 DEEP FRAME, COLORBOND MONUMENT FINISH.

3 OFF-4000x1500 ARTWORK - 'RUSTIC' FINISH. LOCAL ARTIST TO FINALISE SELECTION.

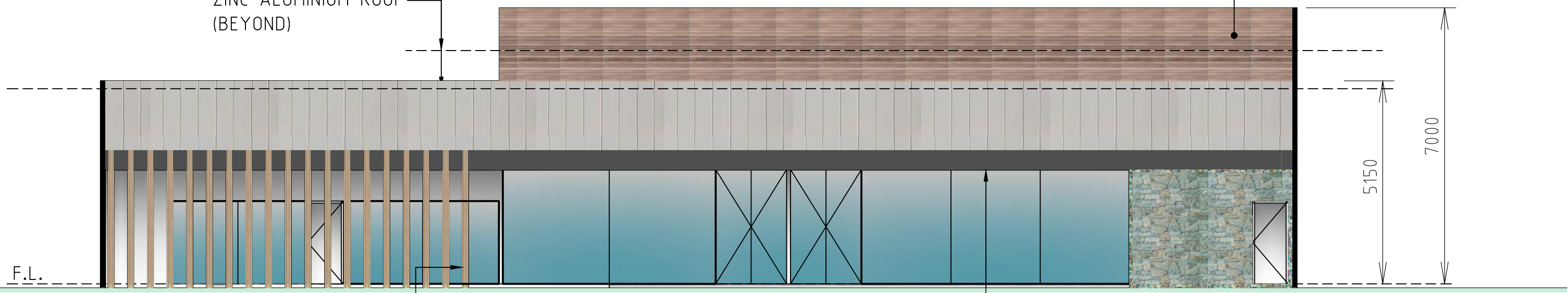
### **EAST ELEVATION**

SCALE 1:100  
SOUTH WEST HIGHWAY

EXISTING EUCALYPTUS TREES (2 OFF) TO REMAIN.

ZINC ALUMINIUM ROOF (BEYOND)

DECO CLAD V-GROOVE CLADDING IN DECOWOOD FINISH WEATHERED TIMBER



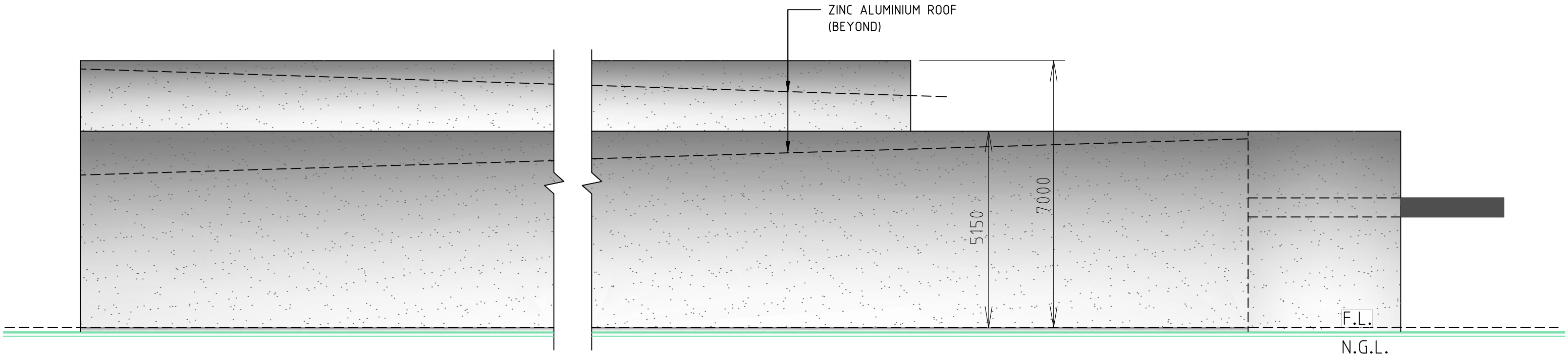
150x100 'ROUGH SAWN' TIMBER POST/BEAM

### **WEST ELEVATION**

SCALE 1:100  
ENTRANCE

CANOPY COLORBOND MONUMENT FINISH

LOT 4 ROBERTSON ROAD BYFORD  
4 of 5 (A3 SHEET)



# **SIDE ELEVATION**

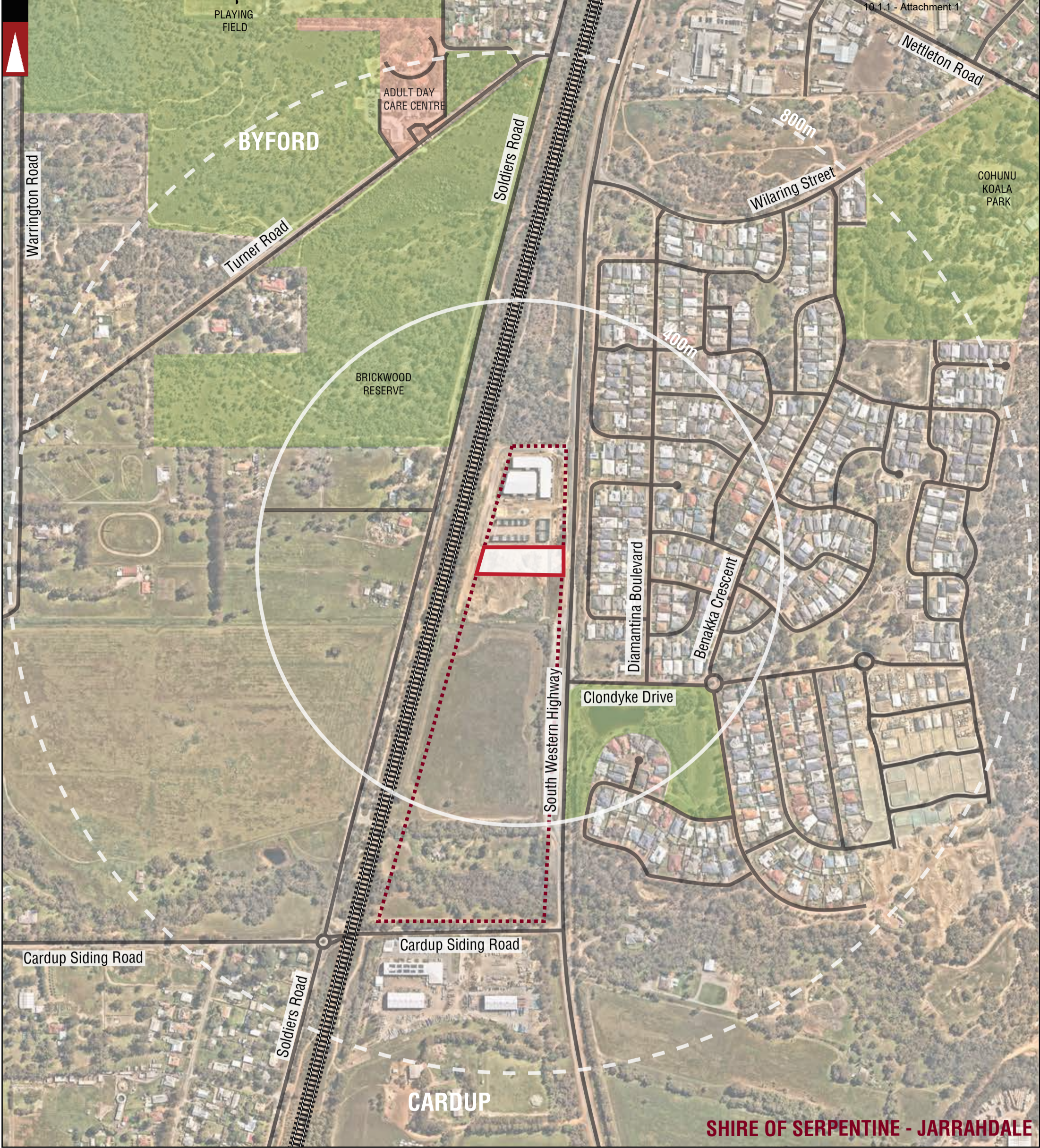
SCALE 1:100

LOT 4 ROBERTSON ROAD BYFORD  
5of5 (A3 SHEET)



# **Appendix 2**

## **Transport Planning and Traffic Plans**



**SHIRE OF SERPENTINE - JARRAHDALE**

PARKS AND RECREATION	ROAD	SUBJECT SITE BOUNDARY	LSP BOUNDARY
WATERWAYS	STREET NAME	DISTANCE FROM LOCATION	
PUBLIC PURPOSE	RAILWAY	BYFORD SUBURB	
<b>SHIRE OF SERPENTINE JARRAHDALE</b> LOCAL GOVERNMENT NAME			

**LEGEND**

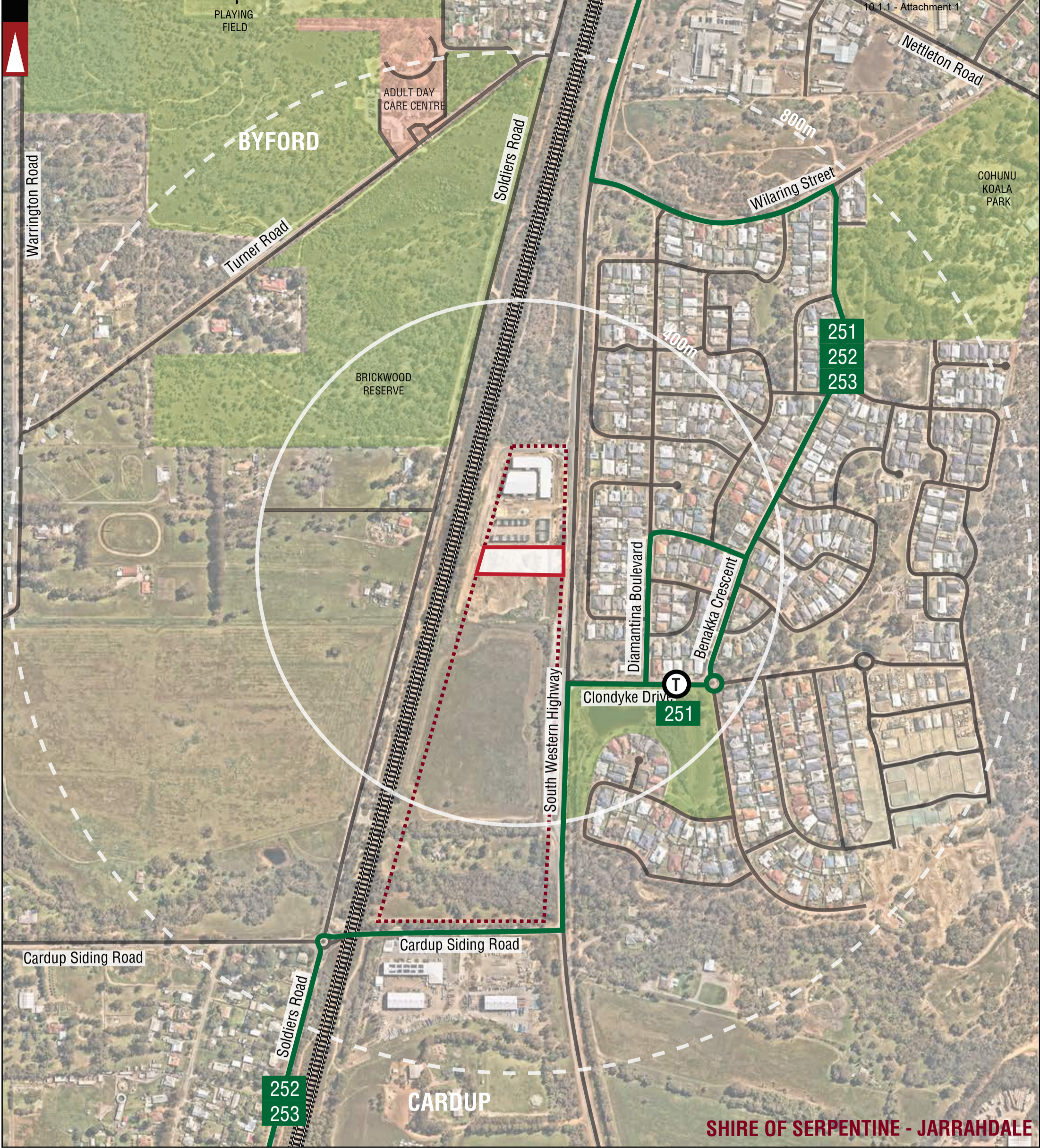
No	DATE	AMENDMENT
A	02-11-2022	ISSUED FOR REVIEW

PROJECT: <b>LOT 128 ROBERTSON ROAD, BYFORD</b>	DRAWN BY: <b>J.S</b>
TITLE: <b>LOCALITY PLAN - 800M RADIUS</b>	
DRAWING NUMBER: <b>KC01510.000_ S01</b>	

**Civil & Traffic Engineering Consultants**  
**KCTT** (Trading as KC Traffic and Transport Pty Ltd)  
 PO Box 1456 Scarborough WA 6922

PH: 08 9441 2700  
 WEB: www.kctt.com.au





**SHIRE OF SERPENTINE - JARRAHDALE**

	PARKS AND RECREATION		ROAD		SUBJECT SITE BOUNDARY		BUS ROUTE NUMBER		251	ARMADALE STATION - BYFORD (VIA SOUTH WESTERN HIGHWAY)
	WATERWAYS		STREET NAME		LSP BOUNDARY		BUS ROUTES		252	ARMADALE STATION - MUNDIJONG (VIA BYFORD)
	PUBLIC PURPOSE		RAILWAY		DISTANCE FROM LOCATION		BUS TERMINUS		253	ARMADALE STATION - JARRAHDALE (VIA BYFORD & MUNDIJONG)
	SHIRE OF SERPENTINE JARRAHDALE		LOCAL GOVERNMENT NAME		BYFORD					

**LEGEND**

A	02-11-2022	ISSUED FOR REVIEW
No	DATE	AMENDMENT

PROJECT:	LOT 128 SOUTH WESTERN HIGHWAY, BYFORD
TITLE:	PUBLIC TRANSPORT PLAN - 800M RADIUS
DRAWING NUMBER:	KC01510.000_S03

DRAWN BY: **Civil & Traffic Engineering Consultants KCTT** (Trading as KC Traffic and Transport Pty Ltd)  
 PO Box 1456 Scarborough WA 6922

J.S

PH: 08 9441 2700  
 WEB: www.kctt.com.au





**SHIRE OF SERPENTINE - JARRAHDALE**

PARKS AND RECREATION	ROAD	SUBJECT SITE BOUNDARY	LSP BOUNDARY	PEDESTRIAN PATH WITHIN 400M RADIUS FROM THE SUBJECT SITE LOCATION
WATERWAYS	STREET NAME	DISTANCE FROM LOCATION		
PUBLIC PURPOSE	RAILWAY	BYFORD SUBURB		
SHIRE OF SERPENTINE JARRAHDALE LOCAL GOVERNMENT NAME				

**LEGEND**

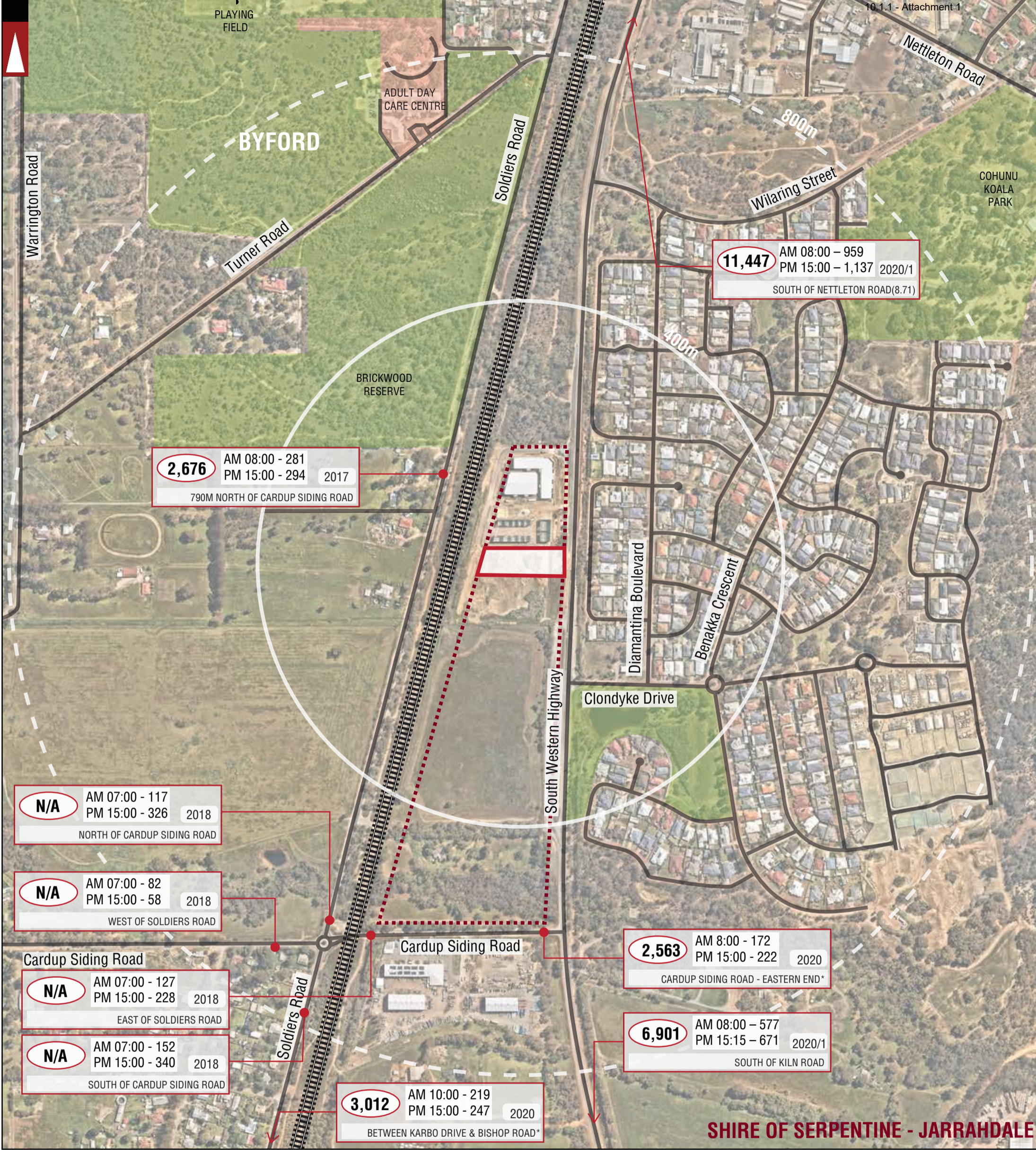
No	DATE	AMENDMENT
A	02-11-2022	ISSUED FOR REVIEW

PROJECT: <b>LOT 128 ROBERTSON ROAD, BYFORD</b>	DRAWN BY: <b>J.S</b>
TITLE: <b>PEDESTRIAN PATHS PLAN - 800M RADIUS</b>	
DRAWING NUMBER: <b>KC01510.000_S04</b>	

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**KCTT** (Trading as KC Traffic and Transport Pty Ltd)  
 PO Box 1456 Scarborough WA 6922

PH: 08 9441 2700  
 WEB: www.kctt.com.au





**SHIRE OF SERPENTINE - JARRAHDALE**

PARKS AND RECREATION	ROAD	SUBJECT SITE BOUNDARY	NUMBER OF VEHICLES PER DAY
WATERWAYS	Hay Street STREET NAME	LSP BOUNDARY	NUMBER OF VEHICLES PER AM PEAK HOUR
PUBLIC PURPOSE	RAILWAY	DISTANCE FROM LOCATION	NUMBER OF VEHICLES PER PM PEAK HOUR
SHIRE OF SERPENTINE JARRAHDALE LOCAL GOVERNMENT NAME	BYFORD SUBURB	YEAR	LOCATION

**LEGEND**

No	DATE	AMENDMENT
A	02-11-2022	ISSUED FOR REVIEW







PROJECT:	LOT 128 SOUTH WESTERN HIGHWAY, BYFORD
TITLE:	EXISTING TRAFFIC COUNTS - 800M RADIUS
DRAWING NUMBER:	KC01510.000_S05

DRAWN BY:	<b>Civil &amp; Traffic Engineering Consultants</b> KCTT (Trading as KC Traffic and Transport Pty Ltd) PO Box 1456 Scarborough WA 6922
J.S	
	PH: 08 9441 2700 WEB: www.kctt.com.au





**SHIRE OF SERPENTINE - JARRAHDALE**

	LOCATION BOUNDARY		Total Expected Traffic Generation from the proposed development		Traffic Flow IN Direction
	RAILWAY		Total Expected Traffic Generation from Subject Site on the specific section of road - IN and OUT direction		Traffic Flow OUT Direction
Lewis Road	ROAD NAME				

**LEGEND**







C	14-12-2022	PROPOSED LAYOUT AMENDED	PROJECT: LOT 128 SOUTH WESTERN HIGHWAY, BYFORD	DRAWN BY: Civil & Traffic Engineering Consultants KCTT (Trading as KC Traffic and Transport Pty Ltd) PO Box 1456 Scarborough WA 6922
B	09-12-2022	PROPOSED LAYOUT AMENDED	TITLE: TRAFFIC FLOW DIAGRAM - DAILY (WEEKDAYS)	J.S.
A	04-11-2022	ISSUED FOR REVIEW	DRAWING NUMBER: KC01510.000_ S06a	
No	DATE	AMENDMENT		

PH: 08 9441 2700  
WEB: www.kctt.com.au





**SHIRE OF SERPENTINE - JARRAHDALE**

	LOCATION BOUNDARY		Total Expected Traffic Generation from the proposed development		Traffic Flow IN Direction
	RAILWAY		Total Expected Traffic Generation from Subject Site on the specific section of road - IN and OUT direction		Traffic Flow OUT Direction
Lewis Road	ROAD NAME				

**LEGEND**

C	14-12-2022	PROPOSED LAYOUT AMENDED	PROJECT: LOT 128 SOUTH WESTERN HIGHWAY, BYFORD	DRAWN BY: Civil & Traffic Engineering Consultants KCTT (Trading as KC Traffic and Transport Pty Ltd) PO Box 1456 Scarborough WA 6922
B	09-12-2022	PROPOSED LAYOUT AMENDED	TITLE: TRAFFIC FLOW DIAGRAM - DAILY (WEEKENDS)	J.S.
A	04-11-2022	ISSUED FOR REVIEW	DRAWING NUMBER: KC01510.000_ S06b	
No	DATE	AMENDMENT		







PH: 08 9441 2700  
WEB: www.kctt.com.au





Note - A shift in traffic flow can be expected once Robertson Road is fully constructed and linked to Cardup Siding Road.

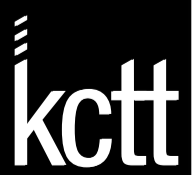
STAGE 2  
128  
1.3174ha

	LOCATION BOUNDARY		Total Expected Traffic Generation from the proposed development		Traffic Flow IN Direction
	RAILWAY		Total Expected Traffic Generation from Subject Site on the specific section of road - IN and OUT direction		Traffic Flow OUT Direction
Lewis Road	ROAD NAME				

**LEGEND**

C	14-12-2022	PROPOSED LAYOUT AMENDED	PROJECT: LOT 128 SOUTH WESTERN HIGHWAY, BYFORD	DRAWN BY: Civil & Traffic Engineering Consultants KCTT (Trading as KC Traffic and Transport Pty Ltd) PO Box 1456 Scarborough WA 6922
B	09-12-2022	PROPOSED LAYOUT AMENDED	TITLE: TRAFFIC FLOW DIAGRAM - PEAK HOUR (WEEKDAYS)	J.S.
A	04-11-2022	ISSUED FOR REVIEW	DRAWING NUMBER: KC01510.000_ S07a	
No	DATE	AMENDMENT		







PH: 08 9441 2700  
WEB: www.kctt.com.au







**SHIRE OF SERPENTINE - JARRAHDALE**

	LOCATION BOUNDARY		Total Expected Traffic Generation from the proposed development		Traffic Flow IN Direction
	RAILWAY		Total Expected Traffic Generation from Subject Site on the specific section of road - IN and OUT direction		Traffic Flow OUT Direction
Lewis Road	ROAD NAME				

**LEGEND**

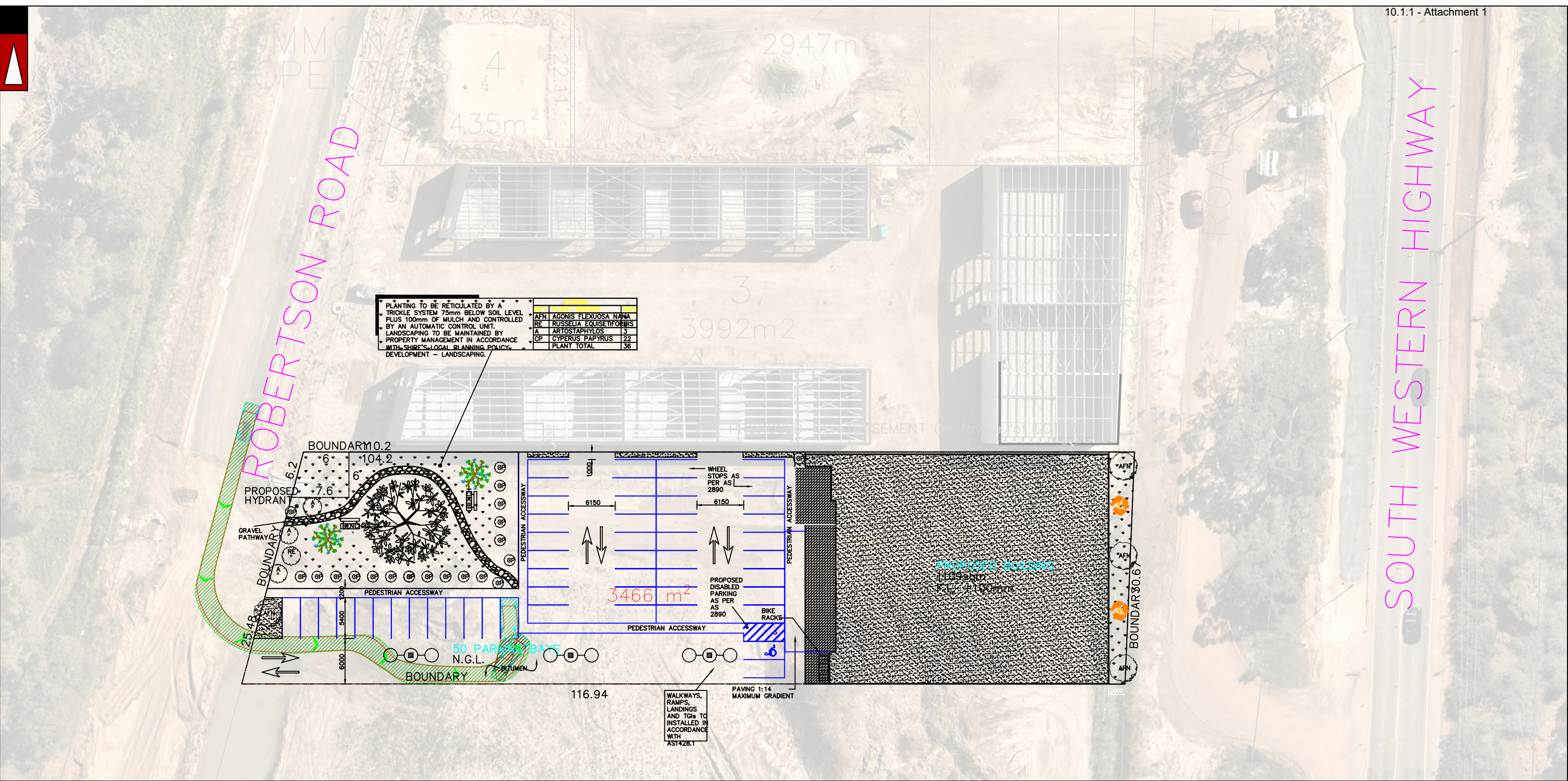
C	14-12-2022	PROPOSED LAYOUT AMENDED	PROJECT: LOT 128 SOUTH WESTERN HIGHWAY, BYFORD	DRAWN BY: Civil & Traffic Engineering Consultants KCTT (Trading as KC Traffic and Transport Pty Ltd) PO Box 1456 Scarborough WA 6922
B	09-12-2022	PROPOSED LAYOUT AMENDED	TITLE: TRAFFIC FLOW DIAGRAM - PEAK HOUR (WEEKENDS)	J.S.
A	04-11-2022	ISSUED FOR REVIEW	DRAWING NUMBER: KC01510.000_ S07b	
No	DATE	AMENDMENT		

PH: 08 9441 2700  
WEB: www.kctt.com.au



# **Appendix 3**

## **Vehicle Turning Circle Plan**

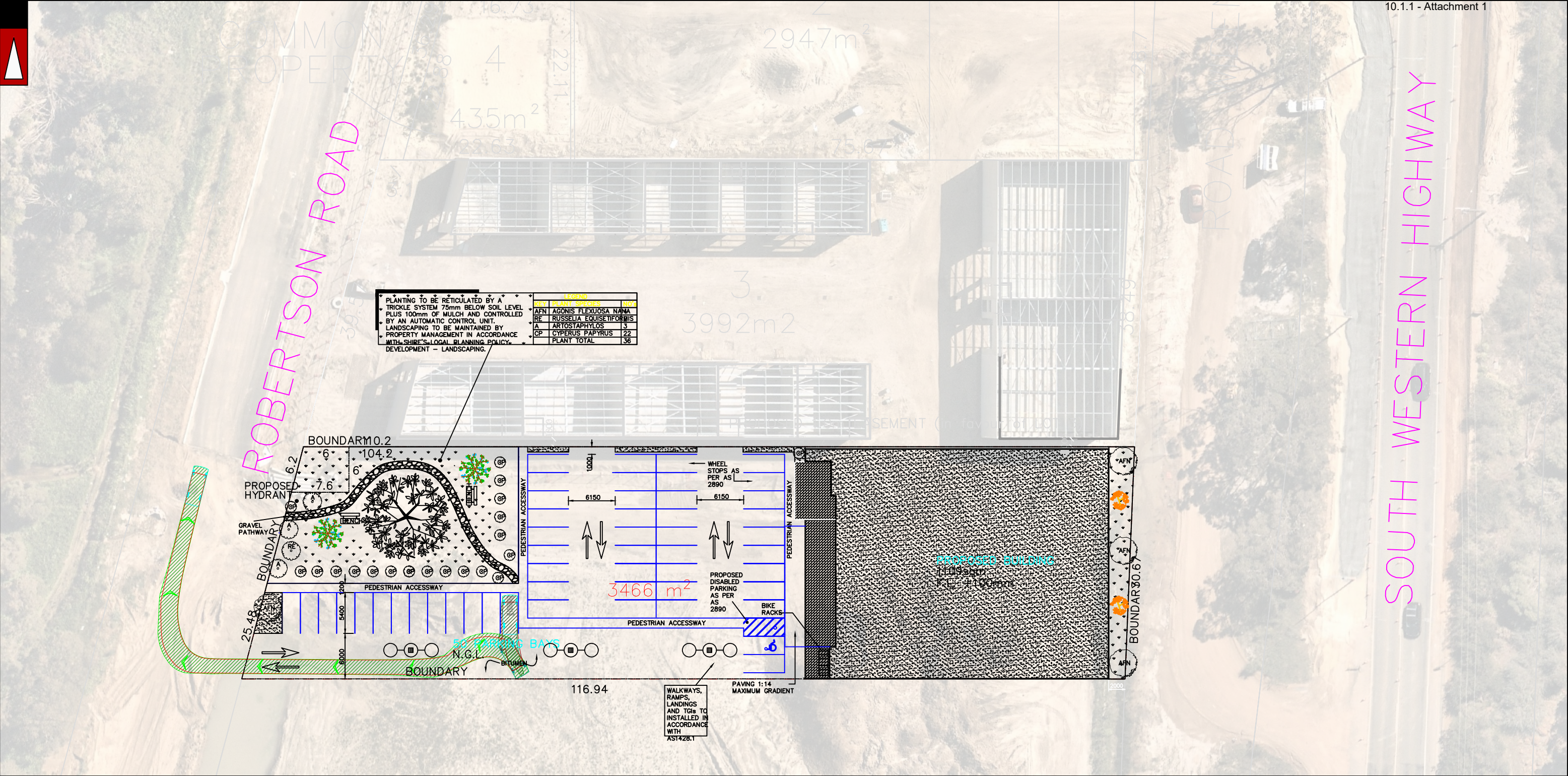


Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford		DRAWN BY: A.M.	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au
B	13-12-2022	PROPOSED LAYOUT AMENDED	TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)		
A	03-11-2022	ISSUED FOR REVIEW	DRAWING NUMBER: KC01510.000_S20a		
NO	DATE	AMENDMENT			

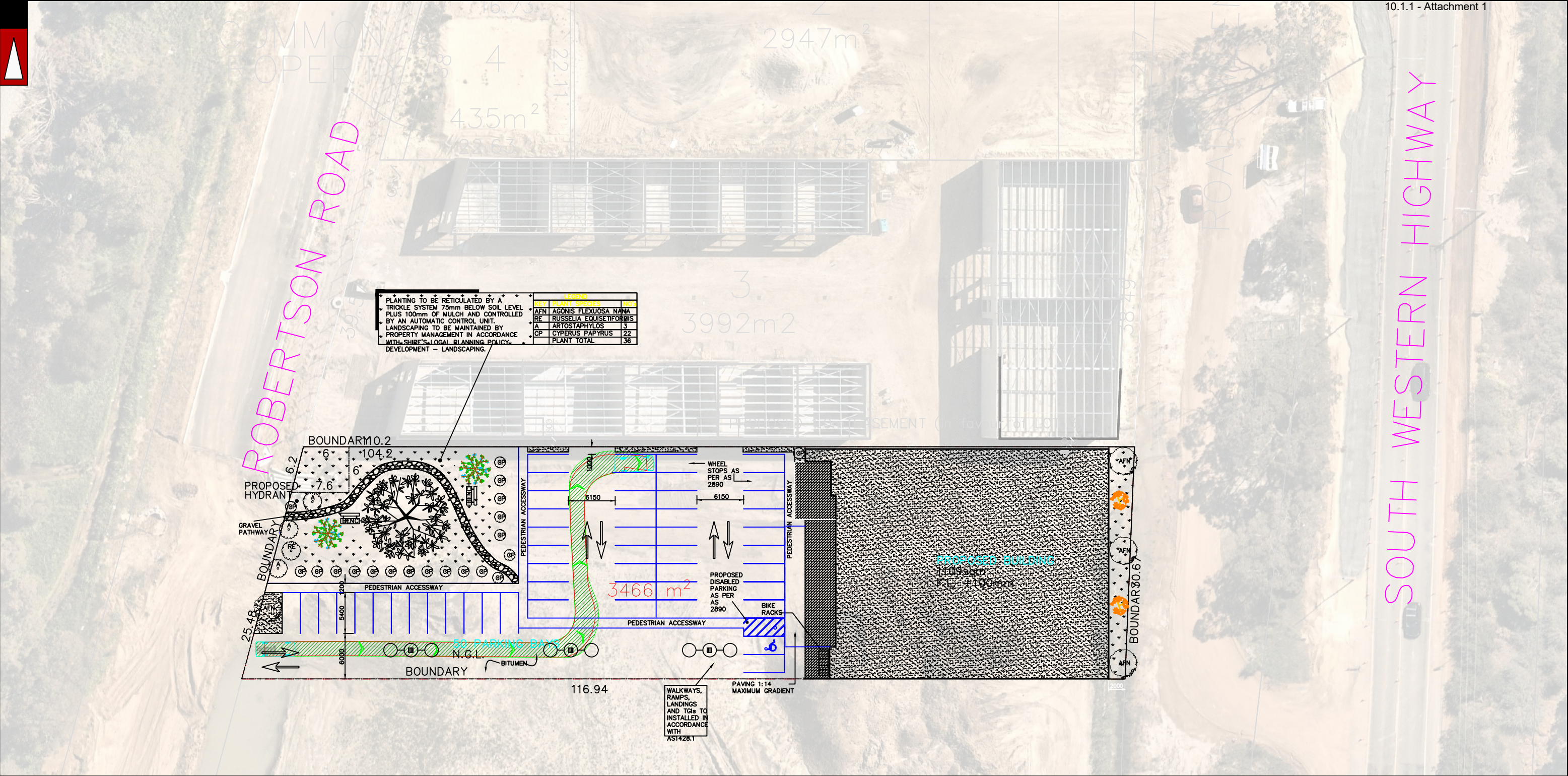




Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au	
B	13-12-2022	PROPOSED LAYOUT AMENDED	A.M.		
A	03-11-2022	ISSUED FOR REVIEW			
NO	DATE	AMENDMENT			
TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)					
DRAWING NUMBER: KC01510.000_S20b					



PLANTING TO BE RETICULATED BY A TRICKLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF MULCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY. DEVELOPMENT - LANDSCAPING.

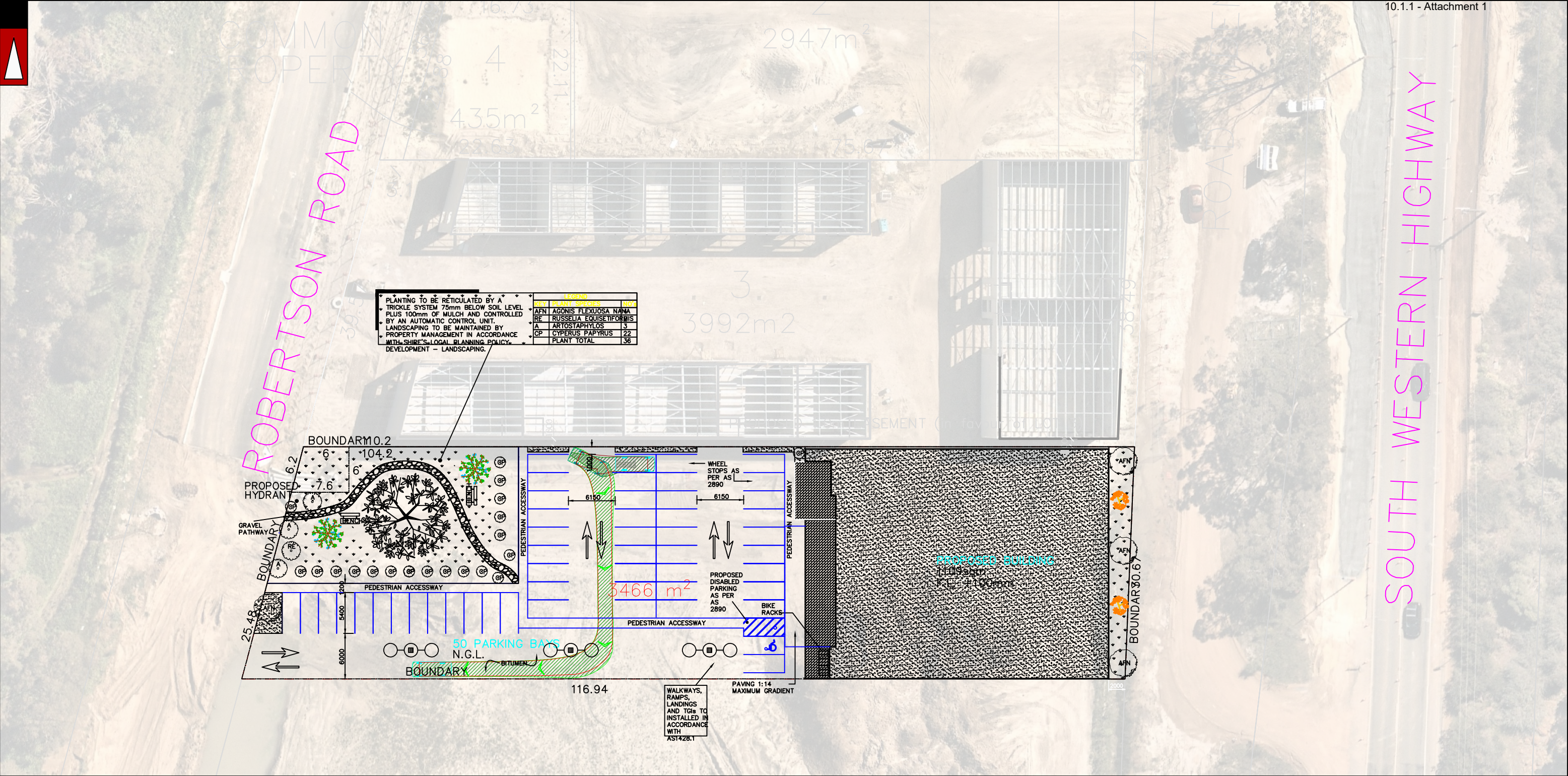
REV	PLANT SPECIES	NO
AFN	AGONIS FLEXUOSA NANA	104
RE	RUSSELLIA EQUISETIFORMIS	3
A	ARTOSTAPHYLOS	3
CP	CYPERUS PAPYRUS	22
	PLANT TOTAL	36

Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY: A.M.	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au
B	13-12-2022	PROPOSED LAYOUT AMENDED		
A	03-11-2022	ISSUED FOR REVIEW		
NO	DATE	AMENDMENT		
TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)				
DRAWING NUMBER: KC01510.000_S21a				



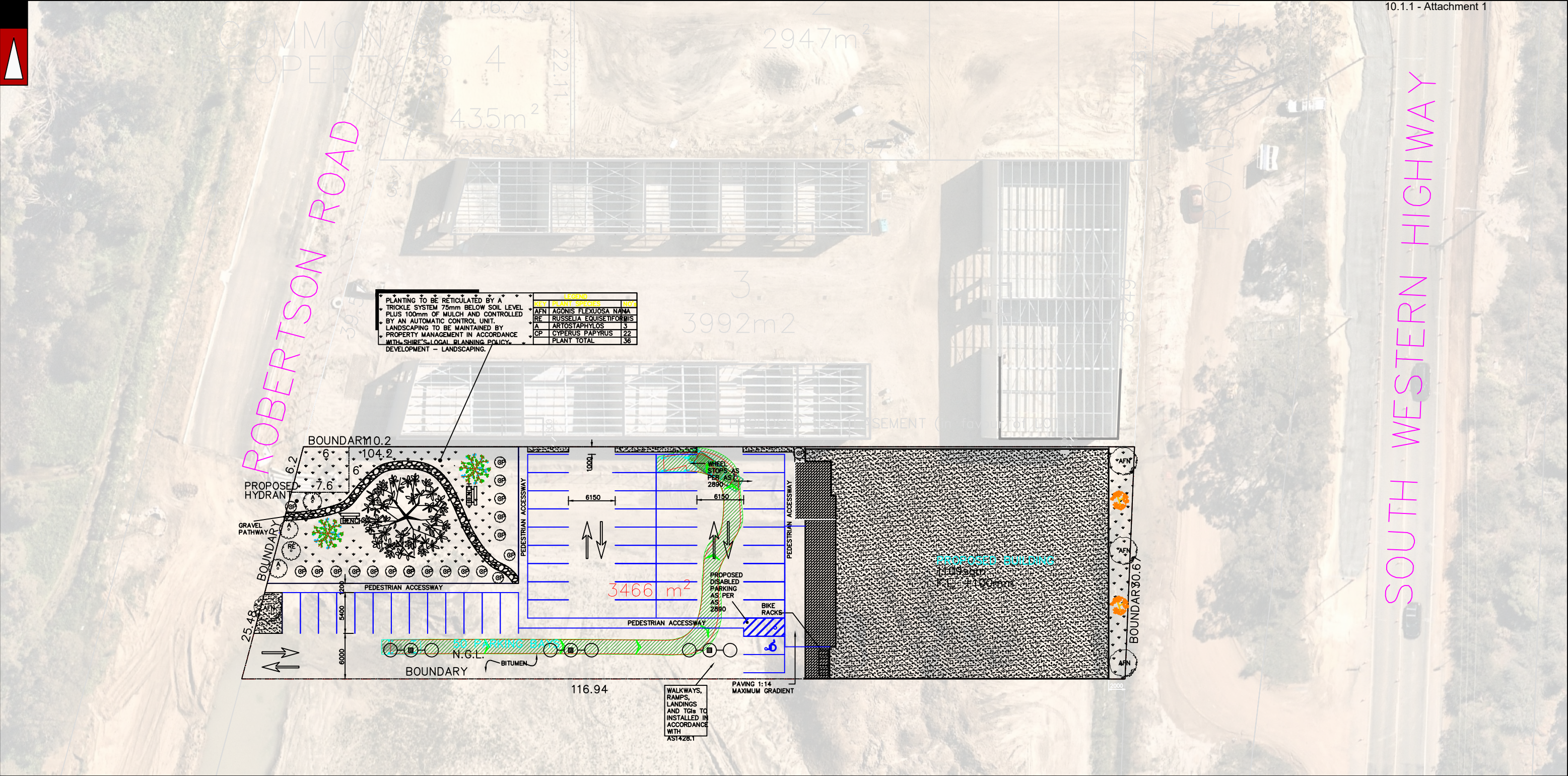


Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au
		TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)		
B	13-12-2022	PROPOSED LAYOUT AMENDED		
A	03-11-2022	ISSUED FOR REVIEW	A.M.	
NO	DATE	AMENDMENT	DRAWING NUMBER: KC01510.000_S21b	

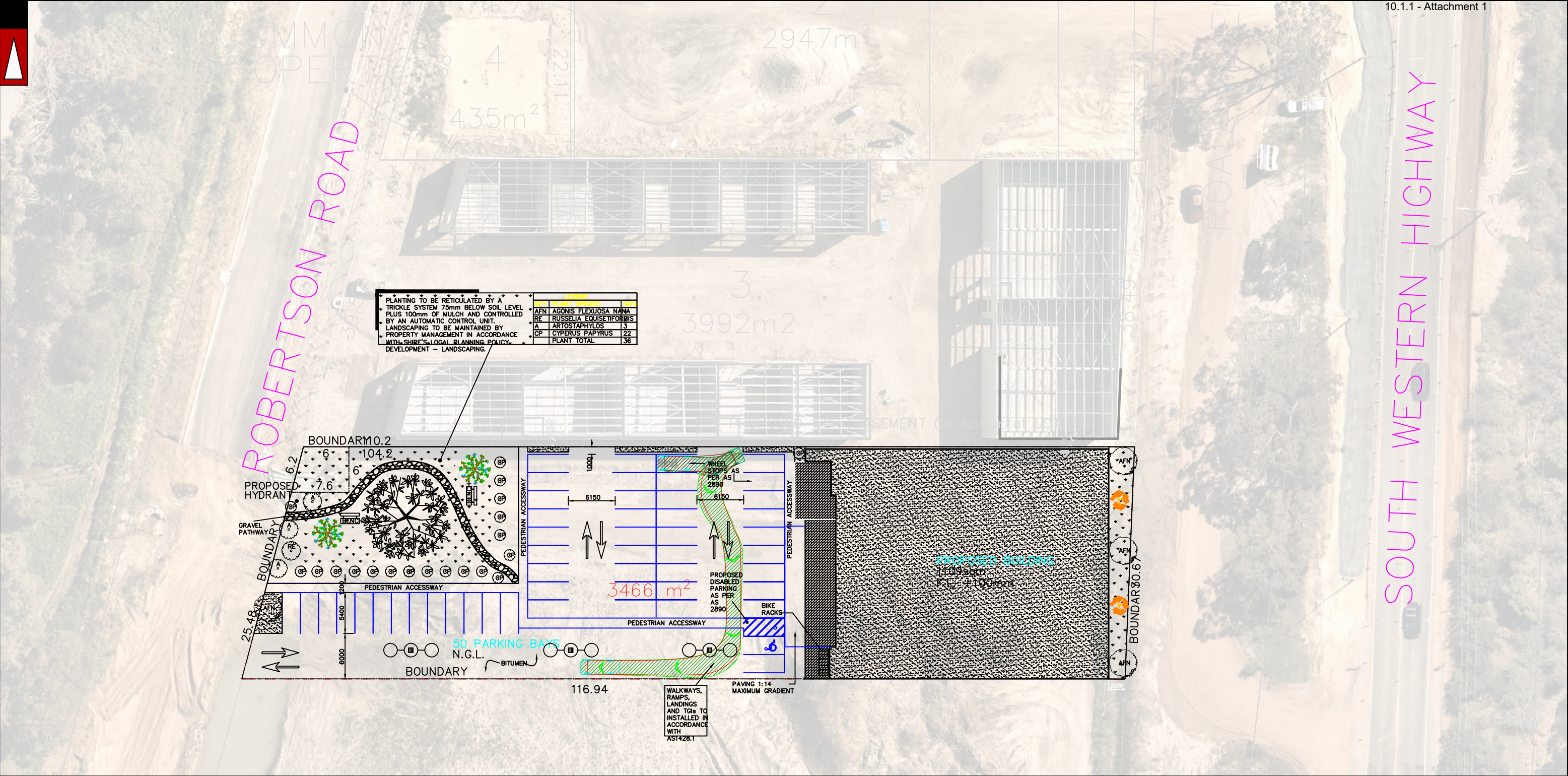




Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

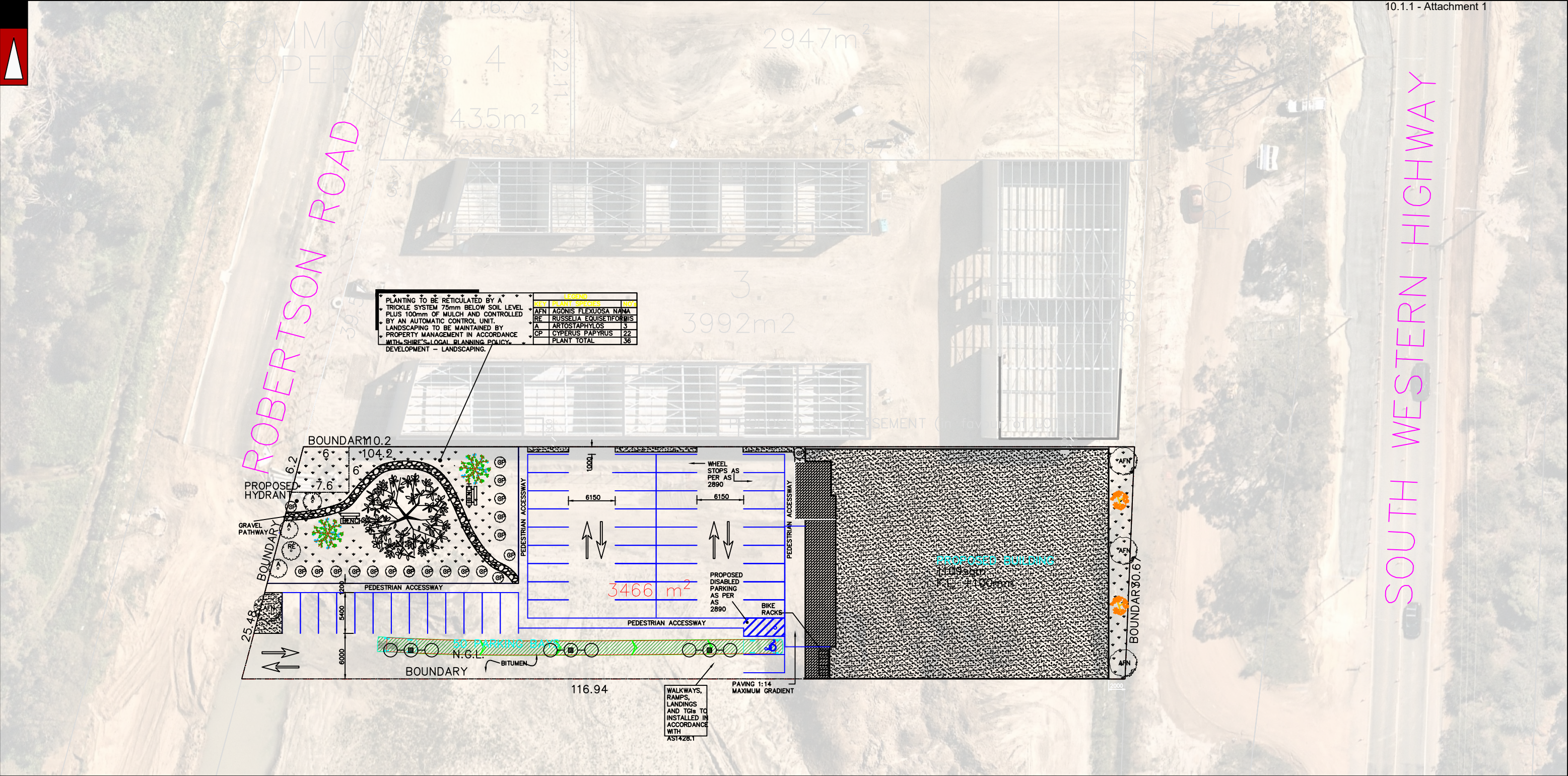
		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au	
		TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)			
B	13-12-2022	PROPOSED LAYOUT AMENDED			
A	03-11-2022	ISSUED FOR REVIEW	A.M.		
NO	DATE	AMENDMENT	DRAWING NUMBER: KC01510.000_S22a		



	Passenger vehicle (5.2 m) Overall Length 5.200m Overall Width 1.940m Overall Body Height 1.804m Min Body Ground Clearance 0.295m Track Width 1.840m Lock to Lock Time 4.00s Kerb to Kerb Turning Radius 6.300m	Lot boundary Wheel Path (Forward Vehicle Motion) Vehicle Chassis Envelope (Forward Vehicle Motion) Wheel Path (Reverse Vehicle Motion) Vehicle Chassis Envelope (Reverse Vehicle Motion)
	<p><b>LEGEND</b></p>	

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:  A.M.	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au	
B	13-12-2022	PROPOSED LAYOUT AMENDED			
A	03-11-2022	ISSUED FOR REVIEW			
NO	DATE	AMENDMENT			



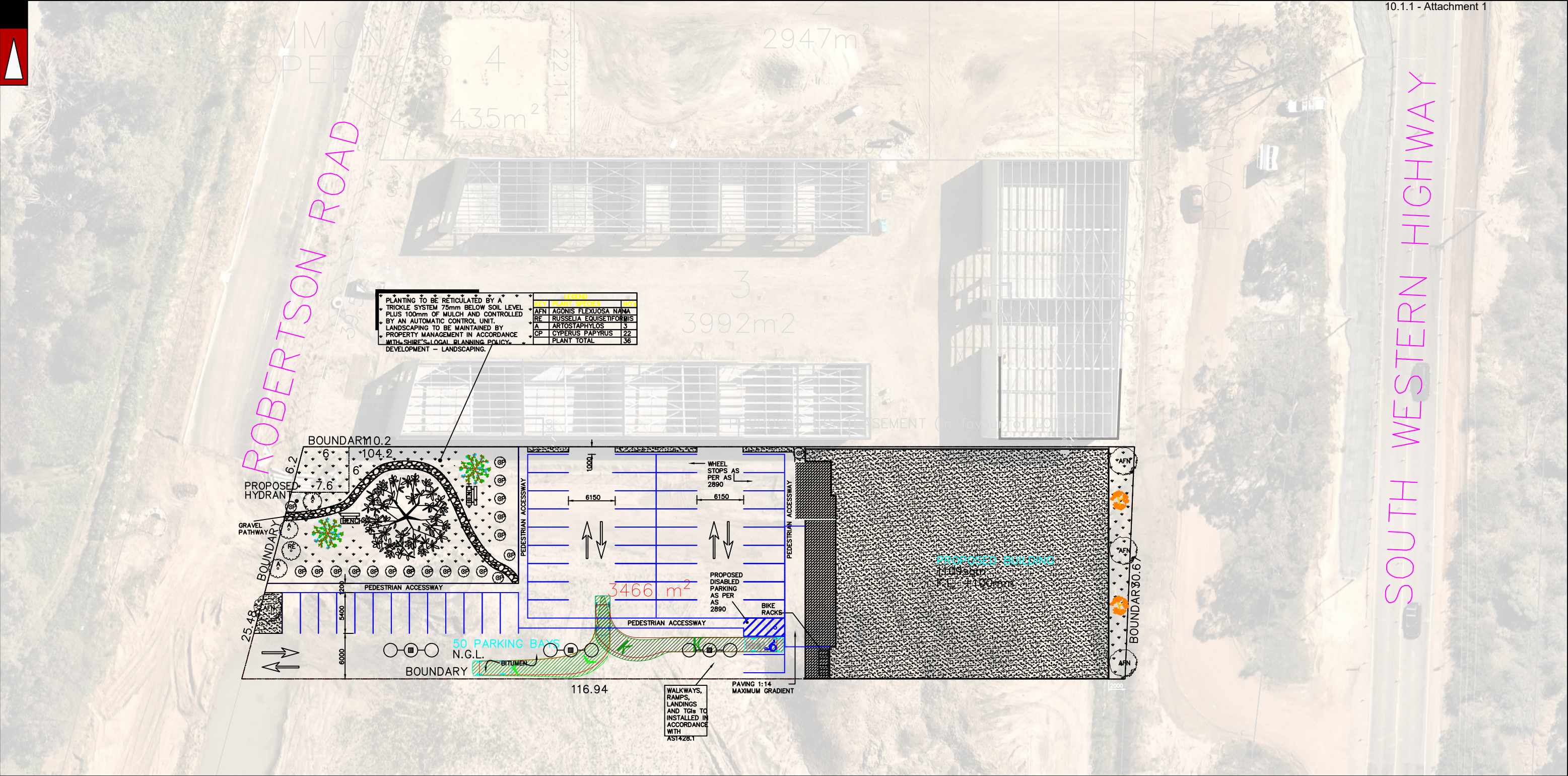


Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY: A.M.	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021  PH: 08 9441 2700 WEB: www.kctt.com.au
B	13-12-2022	PROPOSED LAYOUT AMENDED		
A	03-11-2022	ISSUED FOR REVIEW		
NO	DATE	AMENDMENT		
TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)				
DRAWING NUMBER: KC01510.000_S23a				





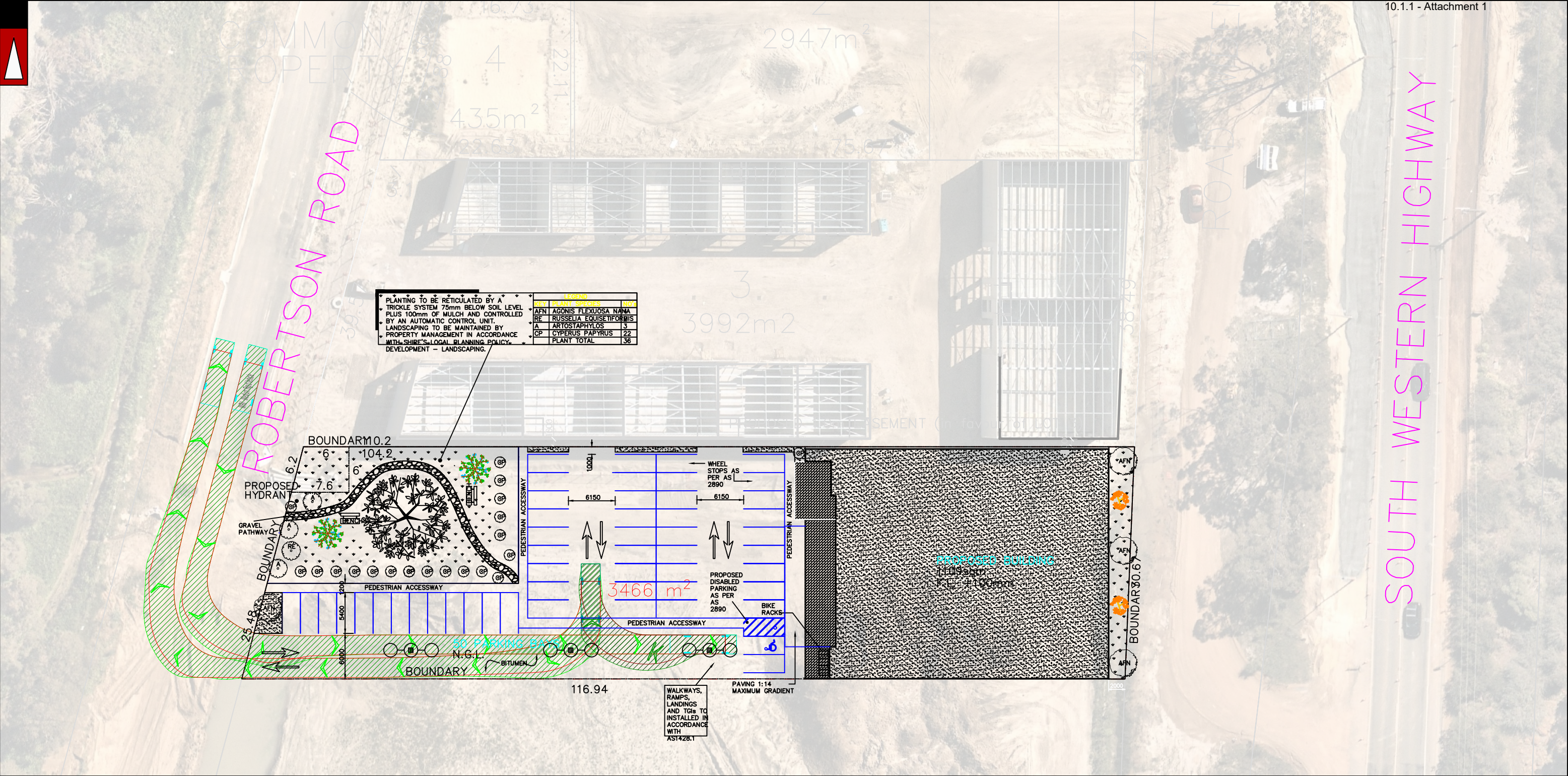
Passenger vehicle (5.2 m)	Lot boundary
Overall Length 5.200m	Wheel Path (Forward Vehicle Motion)
Overall Width 1.940m	Vehicle Chassis Envelope (Forward Vehicle Motion)
Overall Body Height 1.804m	Wheel Path (Reverse Vehicle Motion)
Min Body Ground Clearance 0.295m	Vehicle Chassis Envelope (Reverse Vehicle Motion)
Track Width 1.840m	
Lock to Lock Time 4.00s	
Kerb to Kerb Turning Radius 6.300m	

**LEGEND**

		PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:  A.M.
		TITLE: Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)	
B	13-12-2022	PROPOSED LAYOUT AMENDED	DRAWING NUMBER: KC01510.000_S23b
A	03-11-2022	ISSUED FOR REVIEW	
NO	DATE	AMENDMENT	

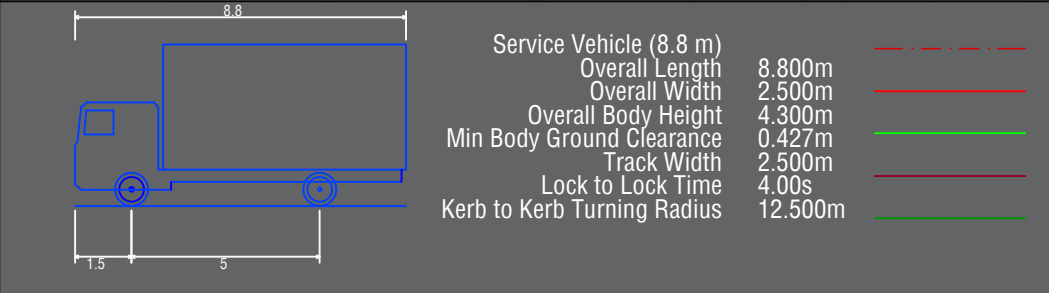
Civil & Traffic Engineering Consultants  
Suite 7 No 10 Whipple Street Balcatta WA 6021

PH: 08 9441 2700  
WEB: www.kctt.com.au



PLANTING TO BE RETICULATED BY A TRICKLE SYSTEM 75mm BELOW SOIL LEVEL PLUS 100mm OF MULCH AND CONTROLLED BY AN AUTOMATIC CONTROL UNIT. LANDSCAPING TO BE MAINTAINED BY PROPERTY MANAGEMENT IN ACCORDANCE WITH SHIRE'S LOCAL PLANNING POLICY DEVELOPMENT - LANDSCAPING.

REF	PLANT SPECIES	NO
AFN	AGONIS FLEXUOSA NANA	10
RE	RUSSELLIA LOUISEIIFORMIS	3
A	ARTOSTAPHYLOS	3
CP	CYPERUS PAPYRUS	22
	PLANT TOTAL	38



- Service Vehicle (8.8 m) Overall Length 8.800m
- Overall Width 2.500m
- Overall Body Height 4.300m
- Min Body Ground Clearance 0.427m
- Track Width 2.500m
- Lock to Lock Time 4.00s
- Kerb to Kerb Turning Radius 12.500m
- Lot boundary
- Wheel Path (Forward Vehicle Motion)
- Vehicle Chassis Envelope (Forward Vehicle Motion)
- Wheel Path (Reverse Vehicle Motion)
- Vehicle Chassis Envelope (Reverse Vehicle Motion)

**LEGEND**

			PROJECT: Lot 128 Robertson Road, Byford	DRAWN BY:  A.M.
			TITLE: Vehicle Turning Circle Plan - Service Vehicle (8.8m)	
B	13-12-2022	PROPOSED LAYOUT AMENDED	DRAWING NUMBER: KC01510.000_S24	
A	03-11-2022	ISSUED FOR REVIEW		
NO	DATE	AMENDMENT		

Civil & Traffic Engineering Consultants  
Suite 7 No 10 Whipple Street Balcatta WA 6021

PH: 08 9441 2700  
WEB: www.kctt.com.au



Harley Dykstra<sup>®</sup>

PLANNING & SURVEY SOLUTIONS

# APPENDIX F

# NOISE IMPACT ASSESSMENT



PROPOSED PLACE OF WORSHIP

**LOT 128 ROBERTSON ROAD, BYFORD**

ENVIRONMENTAL AND TRAFFIC  
ACOUSTIC ASSESSMENT  
NOISE MANAGEMENT PLAN

DECEMBER 2022

OUR REFERENCE: 30398-1-22355

## DOCUMENT CONTROL PAGE

## ACOUSTIC ASSESSMENT

### LOT 128 ROBERTSON ROAD, BYFORD

Job No: 22355

Document Reference: 30398-1-22355

FOR  
**HARLEY DYKSTRA**

DOCUMENT INFORMATION				
<b>Author:</b>	Paul Daly	<b>Checked By:</b>	Tim Reynolds	
<b>Date of Issue:</b>	6 December 2022			
REVISION HISTORY				
Revision	Description	Date	Author	Checked
DOCUMENT DISTRIBUTION				
Copy No.	Version No.	Destination	Hard Copy	Electronic Copy
1	1	Harley Dykstra Attn: Miranda Bowman Email <a href="mailto:mirandab@harleydykstra.com.au">mirandab@harleydykstra.com.au</a>		✓

This report has been prepared in accordance with the scope of services and on the basis of information and documents provided to Herring Storer Acoustics by the client. To the extent that this report relies on data and measurements taken at or under the times and conditions specified within the report and any findings, conclusions or recommendations only apply to those circumstances and no greater reliance should be assumed. The client acknowledges and agrees that the reports or presentations are provided by Herring Storer Acoustics to assist the client to conduct its own independent assessment.

## Herring Storer Acoustics

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### APPENDICIES

A	Site Plan
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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned by Harley Dykstra on behalf of Centrepont Care to undertake an acoustic assessment of noise emissions associated with the development of Lot 128 Robertson Road, Byford.

This report assesses noise emissions from the premises with regards to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*.

Also, noise received within the development from vehicles travelling along the South Western Highway is assessed and if exceedance with the stated criteria were determined, to establish the required attenuation measures to control noise intrusion to acceptable levels. The traffic noise assessment has been carried out in accordance with the WAPC State Planning Policy 5.4 "Road and Rail Noise" for which the trigger distances for the noise sources are shown in Figure 1.1.

It is noted that the freight rail line does not require assessment under the policy for this development.

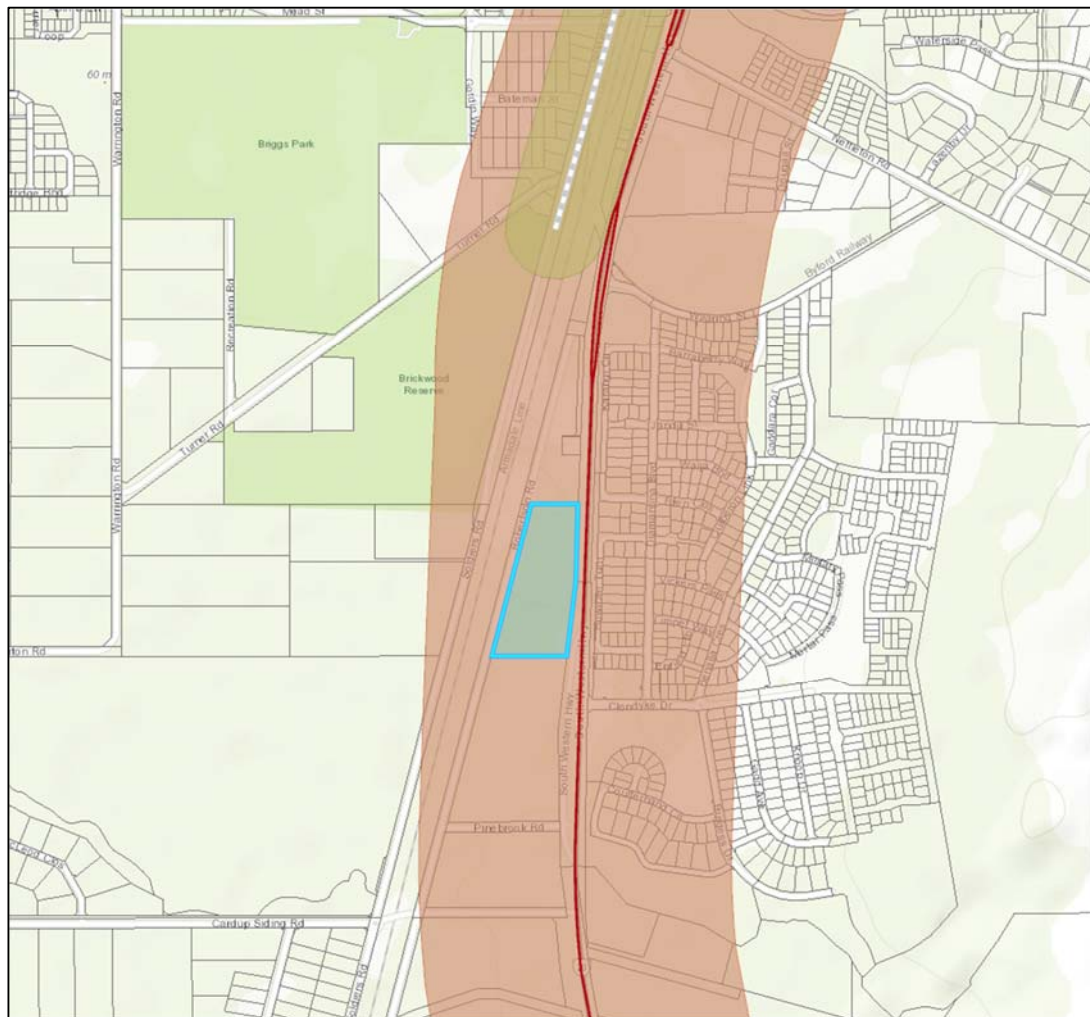


FIGURE 1.1 – SPP 5.4 TRIGGER NOISE SOURCES



It is understood that the development is to consist of a church meeting hall, therefore noise sources considered as part of this assessment include:

- Singing / Music Inside.
- Plant by way of the air conditioning.
- Car movements on site.

Information provided for the operating conditions of the proposed development are as follows:

- Sunday Morning service (10AM) - 150 people (Approx)
- Friday night youth program - 30 young people
- Mums Playgroup (Fortnightly) - Around 25
- Daytime administration use - Around 5-10 people
- All other days/hours (8am – 10pm) subject to facility hire.

It is noted that worship takes the form of amplified singing & individuals speaking. There is no call to worship or bell ringing.

For information, the site plan for the proposed development is attached in Appendix A.

## 2. SUMMARY

### **Noise Ingress**

Under the Western Australian Planning Commission (WAPC) Planning Policy 5.4 “*Road and Rail Noise*” (SPP5.4), we believe that the appropriate criteria for assessment for this development are as listed below for “Noise Limits”.

#### **EXTERNAL**

$L_{Aeq(Day)}$  of 55 dB(A); and  
 $L_{Aeq(Night)}$  of 50 dB(A).

#### **INTERNAL**

$L_{Aeq(Day)}$  of 40 dB(A) in living and work areas; and  
 $L_{Aeq(Night)}$  of 35 dB(A) in bedrooms.

Noise received at an outdoor area should also be reduced as far as practicable, with an aim of achieving an  $L_{Aeq}$  (night) of 50 dB(A).

Based on the assessment, the internal noise level would be between 33-34 dB(A). When comparing to the criteria in SPP 5.4, compliance is achieved with the 40 dB(A)  $L_{Aeq(day)}$ . Therefore, no further noise amelioration is required.

## Noise Emissions

For this development, the closest residential premises (138 Howitzer Turn) of concern are located to the east of the proposed development. Other neighbouring premises are zoned as Industrial.

As the meeting hall could be used from 9:30am on Sundays (service starting at 10am), noise received at the neighbouring noise (highly) sensitive premises from these noise sources needs to comply with the appropriate assigned noise levels of:

### Highly Noise Sensitive Premises

- 19:00 to 22:00 hours Monday to Saturday and after 0900 hours Sunday and Public Holidays  $L_{A10}$  41-44 dB(A),  $L_{A1}$  51-54 dB(A) and  $L_{Amax}$  77 dB(A).

### Commercial Premises

- All Hours  $L_{A10}$  60 dB(A),  $L_{A1}$  70 dB(A) and  $L_{Amax}$  80 dB(A).

The noise associated with car movements on site would be of short term duration and compliance with the assigned  $L_{A1}$  noise levels, are required. Noise from the mechanical plant and singing / music during worship would occur for more than 10% of the time, hence noise received at the neighbouring premises needs to comply with the assigned  $L_{A10}$  noise levels.

It is noted that as the development would be considered as a public place, noise emissions associated with the vehicles on site need to be considered individually.

The assessment indicates that noise emissions from cars on site would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

Noise emissions from car doors closing, need to comply with the assigned  $L_{Amax}$  noise levels.

Based on the design provided, noise received at the neighbouring premises from the development would be deemed to comply with the Regulatory requirements at all times.

## 3. CRITERIA

### 3.1 ROAD TRAFFIC NOISE

The Western Australian Planning Commission (WAPC) released on 6<sup>th</sup> September 2019 State Planning Policy 5.4 "Road and Rail Noise". The requirements of State Planning Policy 5.4 are outlined below.

#### POLICY APPLICATION (Section 4)

#### When and where it applies (Section 4.1)

*SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed:*

- a) noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in **Table 1**;*
- b) New or major upgrades of roads as specified in **Table 1** and maps (**Schedule 1,2 and 3**); or*
- c) New railways or major upgrades of railways as specified in maps (**Schedule 1, 2 and 3**); or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise.*

Policy trigger distances (Section 4.1.2)

**Table 1** identifies the State’s transport corridors and the trigger distances to which the policy applies.

The designation of land within the trigger distances outlined in **Table 1** should not be interpreted to imply that land is affected by noise and/or that areas outside the trigger distances are un-affected by noise.

Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/mitigation required. An initial screening assessment (**guidelines: Table 2: noise exposure forecast**) will determine if the lot is affected and to what extent.”

**TABLE 1: TRANSPORT CORRIDOR CLASSIFICATION AND TRIGGER DISTANCES**

<b>Transport corridor classification</b>	<b>Trigger distance</b>	<b>Distance measured from</b>
<b>Roads</b>		
<b>Strategic freight and major traffic routes</b> Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume	300 metres	Road carriageway edge
<b>Other significant freight/traffic routes</b> These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meet the criteria of either >=23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes)	200 metres	Road carriageway edge
<b>Passenger railways</b>		
	100 metres	Centreline of the closest track
<b>Freight railways</b>		
	200 metres	Centreline of the closest track

Proponents are advised to consult with the decision making authority as site specific conditions (significant differences in ground levels, extreme noise levels) may influence the noise mitigation measures required, that may extend beyond the trigger distance.

POLICY MEASURES (Section 6)

The policy applies a performance-based approach to the management and mitigation of transport noise. The policy measures and resultant noise mitigation will be influenced by the function of the transport corridor and the type and intensity of the land-use proposed. Where there is risk of future land-use conflict in close proximity to strategic freight routes, a precautionary approach should be applied. Planning should also consider other broader planning policies. This is to ensure a balanced approach takes into consideration reasonable and practical considerations.

Noise Targets (Section 6.1)

**Table 2** sets out noise targets that are to be achieved by proposals under which the policy applies. Where exceeded, an assessment is required to determine the likely level of transport noise and management/mitigation required.

*In the application of the noise targets the objective is to achieve:*

- *indoor noise levels as specified in **Table 2** in noise sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and*
- *a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.*

*It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.*

**TABLE 2: NOISE TARGETS**

Proposals	New/Upgrade	Noise Targets		
		Outdoor		Indoor
		Day ( $L_{Aeq}(\text{Day})$ dB) (6 am-10 pm)	Night ( $L_{Aeq}(\text{Night})$ dB) (10 pm-6 am)	( $L_{Aeq}$ dB)
Noise-sensitive land-use and/or development	New noise sensitive land use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	$L_{Aeq}$ (Day) 40(Living and work areas)  $L_{Aeq}$ (Night) 35 (bedrooms)
Roads	New	55	50	N/A
	Upgrade	60	55	N/A
Railways	New	55	50	N/A
	Upgrade	60	55	N/A

**Notes:**

- *The noise target is to be measured at one metre from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.*
- *For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.*
- *The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.*
- *Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.*

Noise Exposure Forecast (Section 6.2)

When it is determined that SPP 5.4 applies to a planning proposal as outlined in Section 4, proponents and/or decision makers are required to undertake a preliminary assessment using **Table 2: noise exposure forecast in the guidelines**. This will provide an estimate of the potential noise impacts on noise-sensitive land-use and/ or development within the trigger distance of a specified transport corridor. The outcomes of the initial assessment will determine whether:

- no further measures is required;
- noise-sensitive land-use and/or development is acceptable subject to deemed-to-comply mitigation measures; or
- noise-sensitive land-use and/or development is not recommended. Any noise-sensitive land-use and/ or development is subject to mitigation measures outlined in a noise management plan.”

3.2 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels. For highly sensitive area of a noise sensitive premises this is determined by the calculation of an influencing factor, which is then added to the base levels shown below in Table 3.1. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. For other areas within a noise sensitive premises, the assigned noise levels are fixed throughout the day, as listed in Table 3.1.

**TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		LA10	LA1	LAm <sub>ax</sub>
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: LA10 is the noise level exceeded for 10% of the time.  
 LA1 is the noise level exceeded for 1% of the time.  
 LAm<sub>ax</sub> is the maximum noise level.  
 IF is the influencing factor.

Under the Regulations, a highly sensitive area means that area (if any) of noise sensitive premises comprising –

- (a) A building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) Any other part of the premises within 15 m of that building or that part of the building.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

**“impulsiveness”** means a variation in the emission of a noise where the difference between  $L_{Apeak}$  and  $L_{Amax(Slow)}$  is more than 15 dB when determined for a single representative event;

**“modulation”** means a variation in the emission of noise that –

- (a) is more than 3 dB  $L_{AFast}$  or is more than 3 dB  $L_{AFast}$  in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

**“tonality”** means the presence in the noise emission of tonal characteristics where the difference between –

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as  $L_{Aeq,T}$  levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as  $L_{ASlow}$  levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

Where <b>tonality</b> is present	Where <b>modulation</b> is present	Where <b>impulsiveness</b> is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

The closest residence adjacent to the development have been identified using Shire of Serpentine Jarrahdale Intramaps and are located to the east and west. We note that the residences to the east are within 100m of South Western Highway, which is a secondary road. Thus, the Influencing Factor has been the determination, as outlined in Table 3.3, with Figure 3.1 showing the zoning map.

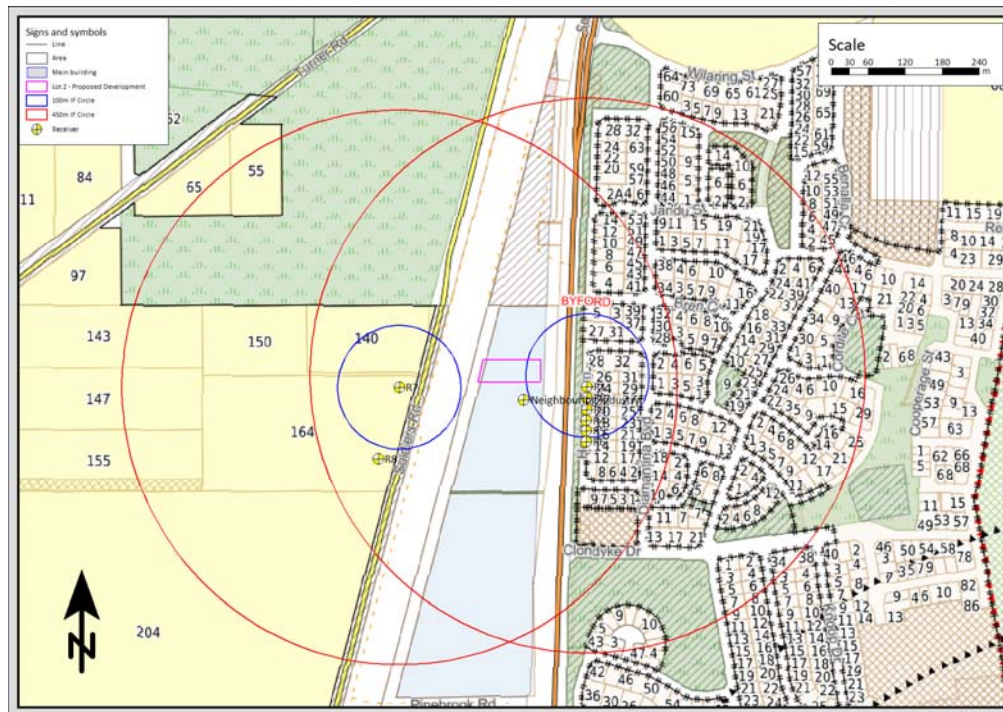


FIGURE 3.1 - RESIDENTIAL LOCATIONS AND INFLUENCING FACTOR

TABLE 3.3 – CALCULATION OF NOISE INFLUENCING FACTOR

Description	Residence	
	R7 and R8 (Residence to West)	R1 to R6 (Residence to East)
Commercial (Inner Circle)	0	20% = +1.0 dB
Commercial (Outer Circle)	20% = +1.0 dB	20% = +1.0 dB
Roads		
Secondary (Inner Circle)	0	+ 2 dB
<b>TOTAL</b>	<b>1 dB</b>	<b>4 dB</b>

The Assigned Noise Levels at the closest neighbouring residences would be as listed in Tables 3.4.

TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		LA10	LA1	LAm <sub>ax</sub>
R7 and R8 (+1)	0700 - 1900 hours Monday to Saturday (Day)	46	56	66
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	41	51	66
	1900 - 2200 hours all days (Evening)	41	51	56
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	36	46	56
R1 to R6 (+4)	0700 - 1900 hours Monday to Saturday (Day)	49	59	69
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	44	54	69
	1900 - 2200 hours all days (Evening)	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	39	49	59
Commercial Premise	All Hours	60	70	80

Note: LA10 is the noise level exceeded for 10% of the time.  
 LA1 is the noise level exceeded for 1% of the time.  
 LAm<sub>ax</sub> is the maximum noise level.

Additional to the above, with regards to vehicles accessing the site, we note that as anyone can access the site and the operators of the premises have no control on who can enter the car park these areas would be designated as public places. Regulation 6 of the *Environmental Protection (Noise) Regulations 1997* relates to noise emissions from public places and under this Regulation, "the person who is causing or permitting that noise to be emitted is to be treated as the occupier...". Therefore, noise emissions from each individual vehicle using the car park needs to comply with the assigned noise levels.

### 3.3 APPROPRIATE CRITERIA

#### 3.3.1 Noise Ingress

Based on the above, the following criteria are proposed for this development:

##### **External**

Day	Maximum of 55 dB(A) $L_{Aeq}$
Night	Maximum of 50 dB(A) $L_{Aeq}$
Outdoor Living Areas*	Maximum of 50 dB(A) $L_{Aeq}$ (night period)

##### **Internal**

Sleeping Areas	35 dB(A) $L_{Aeq}$ (night)
Living Areas	40 dB(A) $L_{Aeq}$ (day)
Sleeping areas	50 dB(A) $L_{Amax}$
Other habitable spaces	55 dB(A) $L_{Amax}$

\*This is a suggested noise level; noise is to be reduced as far as practicably possible.

#### 3.3.2 Noise Emissions

Given the operating times for the propose meeting hall, i.e. Sunday after 09:00 and weeknights between 19:00 and 21:00, the most stringent noise criteria would be the Sunday / evening period with the following criteria being applicable:

##### Highly Noise Sensitive Premises

- 19:00 to 22:00 hours Monday to Saturday and after 0900 hours Sunday and Public Holidays  $L_{A10}$  41-44 dB(A),  $L_{A1}$  51-54 dB(A), and  $L_{Amax}$  66-69 dB(A).

##### Industrial Premises

- All Hours  $L_{A10}$  65 dB(A),  $L_{A1}$  80 dB(A) and  $L_{Amax}$  90 dB(A).



#### 4. MONITORING

To determine the existing acoustic environment at the proposed development, short term noise measurements were undertaken at the site, with data collected for Tuesday 5<sup>th</sup> December 2022 during peak traffic flows on the South Western Highway.

The results of the noise measurements are summarised in Table 4.1.

**TABLE 4.1 – SUMMARY OF NOISE MEASUREMENT**

Location	Measured Noise Level (dB(A))	
	L <sub>10,18hour</sub>	L <sub>eq,16hour</sub>
South Western Highway (10mm from edge)	69.2	67.0

\*DEFRA Calculation

Based on the noise measuring results, the relationship between the L<sub>A10(18 hour)</sub> and the L<sub>Aeq(16hour)</sub> and L<sub>Aeq(8hour)</sub> are as listed in Table 4.2.

**TABLE 4.2 – RELATIONSHIP BETWEEN ACOUSTIC PARAMETERS**

Road	Parameter	Measured Level dB(A)*	Difference between L <sub>10(18hour)</sub> and L <sub>Aeq(parameter)</sub> dB(A)
South Western Highway	L <sub>A10 (18 hour)</sub>		N/A
	L <sub>Aeq, day (6am to 10pm)</sub>		= L <sub>A10 (18 hour)</sub> – 2.2

\* It is normal practice to quote decibels to the nearest whole number. Fractions are retained here to minimise any cumulative rounding error.

#### 5. MODELLING

Predictive noise modelling has been undertaken for both the noise ingress onto the development site from road traffic associated with South Western Highway, and noise emissions from the proposed development onto the surrounding noise sensitive receptors.

##### 5.1 NOISE INGRESS

Modelling of noise received within the development from the Bannister Road was carried out using SoundPlan, using the Calculation of Road Traffic Noise (CoRTN) algorithms. The input data for the model included:

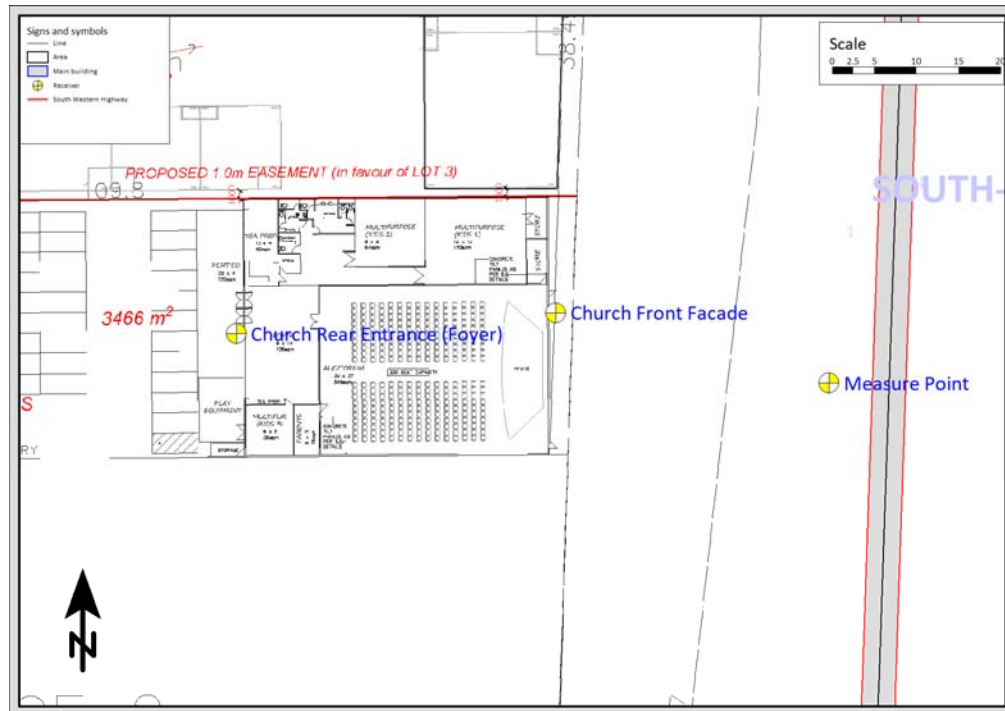
- Increased traffic volume, assuming 2% growth over 20 years (2 dB as per SPP 5.4 implementation guidelines).
- Other traffic data as listed in Table 4.1.
- A +2.5 dB adjustment to allow for façade reflection.

The traffic data currently available on the Main Roads web site are as listed in Table 5.1. Table 5.1 also lists the percentage heavy vehicles and the calculated future traffic flows.

**TABLE 5.1 - SUMMARY OF TRAFFIC DATA**

Parameter	South Western Highway
Current Traffic Flow (vpd) 2020/21	6,901
Future Traffic Flow (vpd) 2041	18,900
Percentage Heavy Vehicles (%)	23.3%
Speed (km/hr)	60

To determine the acoustic requirements as required under SPP 5.4, noise modelling was undertaken for the future traffic flow. Receiver locations are shown in Figure 5.1.



**FIGURE 5.1 ROAD TRAFFIC NOISE RECEIVERS**

For the noise modelling for future traffic it has been assumed that the percentage of future heavy vehicles remains the same as for current traffic flows. In this case, we believe that this is a conservative approach, as we believe that the percentage of heavy vehicles would fall over time.

We also note that from the noise monitoring data, the difference between the  $L_{Aeq,8hr}$  and the  $L_{Aeq,16hr}$  is greater than 5 dB(A), thus, the day period is the critical period for achieving compliance and achieving compliance with the day period criteria will also result in achieving compliance with the night period criteria. However, as the Church operates during day periods, this report only the day period noise levels have been modelled.

Based on the receiver locations, the future resultant noise level is listed Table 5.2.

**TABLE 5.2 – FUTURE NOISE LEVELS**

Receiver Location	Noise Levels dB(A)
Main Meeting Hall (Façade facing Road)	58
Rear Foyer Entrance	37

## 5.2 NOISE EMISSIONS

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, "SoundPlan". Calculations were carried out using the EPA standard weather conditions as stated in the Environmental Protection Authority's "Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise".

To determine the noise received at the neighbouring premises, noise modelling was undertaken for the following scenarios:

- 1 Singing / Music Inside.
- 2 Plant; air conditioning (2 units).
- 3 Car movements on site.
- 4 Cars starting and doors closing.

With regards to noise emissions, the following are noted:

- 1 For the modelling of cars, the noise sources (ie cars) were located not only at the parking bays, but also at the entry crossover point to the development. Thus, ensuring noise modelling was undertaken for the worst-case locations.
- 2 Noise associated with the mechanical services does not take into account any diversity of operation. Such diversity would occur during the night period. Thus, this is a conservative assessment.

The calculations were based on sound power levels and sound pressure levels listed in Table 5.3.

**TABLE 5.3 – GENERAL SOUND POWER / SOUND PRESSURE LEVELS**

Item of Equipment	Sound Power Level, (dB(A))
Cars moving	79
Car Door	87
Air Conditioning Units (Roof Mount Evaporative – Existing)	4 at 60 dB(A) @ 1m
Singing / Music Inside (Amplified)	98
Singing (Unamplified)	75/m <sup>2</sup>

As the information is at development application stage, the mechanical services, including type and location is unknown. Therefore, noise modelling has assumed the plant will be located on the eastern side of the building, hence would be assessable in the worst location in terms of distance to the noise sensitive receivers.

The above noise sources need to comply with the following assigned noise levels:

- L<sub>A10</sub> - Mechanical services and Music / Singing.
- L<sub>A1</sub> - Car movements.
- L<sub>AMax</sub> - Car doors closing.

The resultant noise levels listed in Table 5.4 for the residential locations are for the worst case operating conditions.

**TABLE 5.4 – WORST CASE CALCULATED NOISE LEVELS**

Item	Calculated Noise Levels (dB(A))		
	Mechanical services (Air Con / Music)	Cars (Movement)	Car Door Closing
R1	19	4	16
R2	20	5	22
R3	20	4	18
R4	20	4	17
R5	20	13	23
R6	19	18	31
R7	31	22	33
R8	30	21	31
Neighbouring Commercial	23	15	29

## 6. ASSESSMENT

Given the above possible noise sources, we believe that assessments of the following scenarios are required.

It is noted that noise emissions from the development could be considered tonal, however, the continuous noise levels associated with the surrounding road network and Industry would mask any annoying characteristics such as tonality and impulsiveness.

### 6.1 L<sub>A10</sub> NOISE EMISSIONS

Noise emissions from the mechanical services would be steady state and would operate for the majority of time. For the music noise sources, it would be present for greater than 10% of the representative period. Hence noise received from these sources needs to comply with the assigned L<sub>A10</sub> noise level.

The calculated noise levels were inspected for annoying characteristics, with the adjustments in Table 6.1 below are applicable.

For the noise levels associated with music, a plus 10 dB penalty has been applied, as per regulatory requirements for the receiver to the west. For receiver to the east, due to the solid construction of the building, i.e., now windows etc, the music would not be audible, with the air conditioners being the dominant noise source.

Noise level emissions associated with the air conditioning units are unlikely to be tonal, due to the level and ambient noise.

**TABLE 6.1 – APPLICABLE ADJUSTMENTS AND ADJUSTED L<sub>A10</sub> NOISE LEVELS, dB(A)**

Measurement Location	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)		Adjusted Noise Level, dB(A)
		Where Noise Emission IS music		
		Where impulsiveness is not present	Where impulsiveness is present	
R1	19	-	-	15
R2	20	-	-	20
R3	20	-	-	20
R4	20	-	-	20
R5	20	-	-	20
R6	19	-	-	19
R7	31	+10	-	41
R8	30	+10	-	40
Neighbouring Commercial	23	+ 10	-	33

Tables 6.2 summarises the applicable Assigned Noise Levels, and assessable noise level emissions for each identified case that needed to be considered.

**TABLE 6.2 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	15	Sunday / Public Holiday After 09:00	44	Complies
R2	20			Complies
R3	20			Complies
R4	20			Complies
R5	20			Complies
R6	19			Complies
R7	41		41	Complies
R8	40		41	Complies
Neighbouring Commercial	33		60	Complies

## 6.2 L<sub>A1</sub> NOISE EMISSIONS

Noise emissions from car movements on site need to comply with the assigned L<sub>A1</sub> noise level. As the critical period for compliance for this source is the evening / Sunday Public Holiday (after 09:00) period, this scenario includes noise emissions from the sources associated with L<sub>A1</sub> noise levels. However, as under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels.

Table 6.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.3 – ASSESSMENT OF L<sub>A1</sub> NOISE LEVEL EMISSIONS FROM CARS**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	4	Sunday / Public Holiday After 09:00	54	Complies
R2	5			Complies
R3	4			Complies
R4	4			Complies
R5	13		51	Complies
R6	18			Complies
R7	22			Complies
R8	21			Complies
Neighbouring Commercial	15		70	Complies

**6.3 L<sub>AMAX</sub> NOISE EMISSIONS**

Noise emissions from car doors closing on site need to comply with the assigned L<sub>AMax</sub> noise level. As the critical period for compliance for this source is the evening / Sunday Public Holiday (after 09:00) period, this scenario includes noise emissions from the sources associated with L<sub>AMax</sub> noise levels. However, as under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels. It is note that a +10 penalty has been included for impulsiveness.

Tables 6.4 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.4 – ASSESSMENT OF L<sub>AMAX</sub> NOISE LEVEL EMISSIONS FROM CAR DOORS**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	26	Sunday / Public Holiday After 09:00	64	Complies
R2	32			Complies
R3	28			Complies
R4	27			Complies
R5	33		61	Complies
R6	41			Complies
R7	43			Complies
R8	41			Complies
Neighbouring Commercial	39		80	Complies

From the above assessments, it can be seen that noise received at the neighbouring residence, even using a conservative analysis, complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

6.4 NOISE INGRESS

In accordance with the WAPC Planning Policy 5.4, an assessment of the noise that would be received within the development located at Lot 128 Robertson Road from vehicles travelling on the South Western Highway has been undertaken.

In accordance with the Policy, the following would be the acoustic criteria applicable to this project:

<b>External</b>	
Day	Maximum of 55 dB(A) $L_{Aeq}$
Night	Maximum of 50 dB(A) $L_{Aeq}$
Outdoor Living Areas (Night)	Maximum of 50 dB(A) $L_{Aeq}$
<b>Internal</b>	
Sleeping Areas	35 dB(A) $L_{Aeq(night)}$
Living Areas	40 dB(A) $L_{Aeq(day)}$

Noise received at an outdoor area should also be reduced as far as practicable with an aim of achieving an  $L_{Aeq}$  (night) of 50 dB(A).

From the modelling undertaken, noise received at the development would exceed the above criteria with the noise levels listing in Table 6.5 below.

**TABLE 6.5 – FUTURE NOISE LEVELS**

Receiver Location	Noise Levels dB(A)
Main Meeting Hall (Façade facing Road)	58
Rear Foyer Entrance	37

Based on the external noise levels listed in Table 6.6, calculations were carried out to determine various internal noise levels based on the current acoustic performance of the building. The internal noise level comparison to the applicable criteria are contained in Table 6.6 below.

**TABLE 6.6 – INTERNAL NOISE LEVELS**

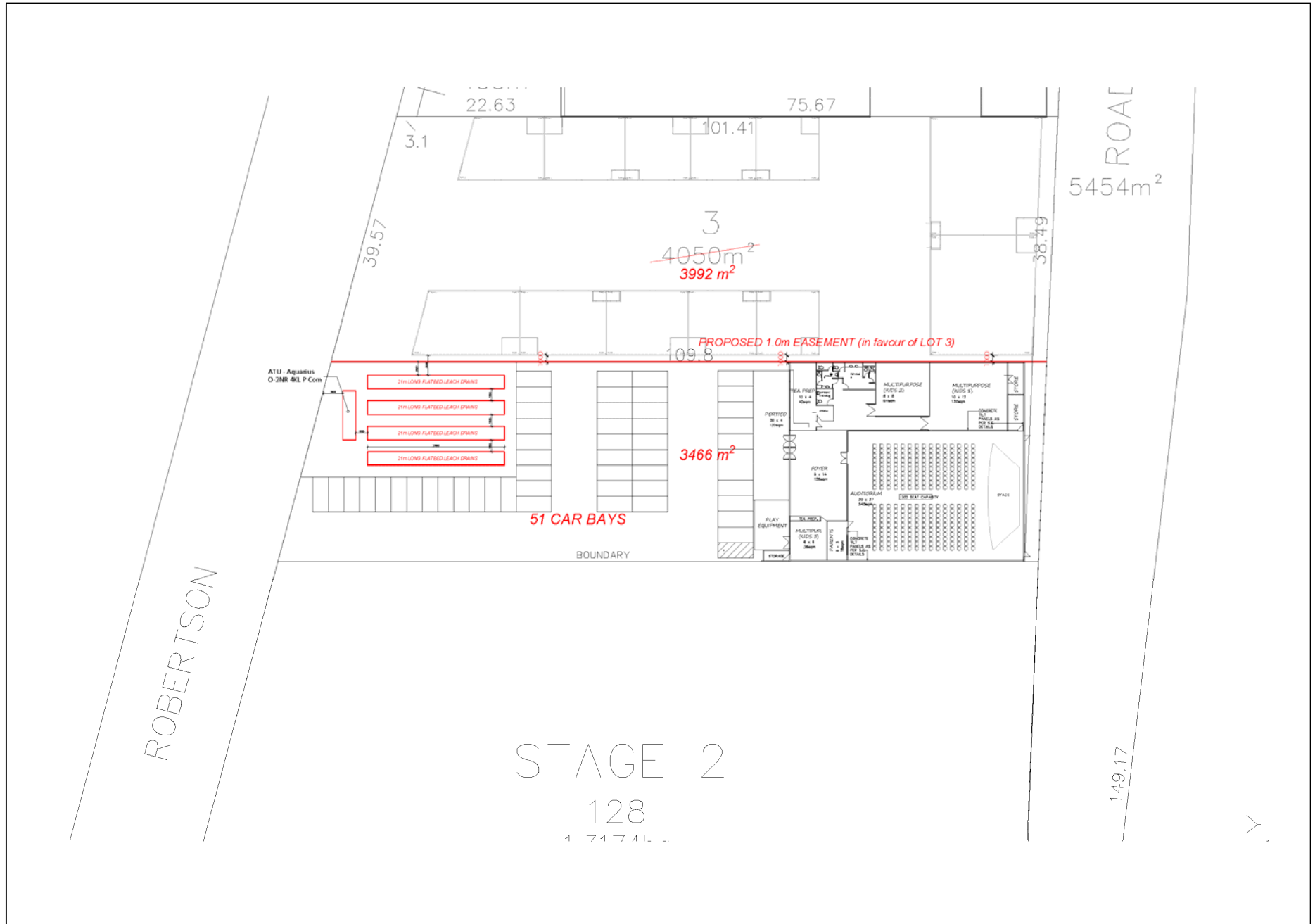
Location	External Future Noise Level dB(A)	Internal Noise Level dB(A)	Comment
Main Meeting Hall (Façade facing Road)	58	<35	Solid Brick (No Windows)
Rear Foyer Entrance	37	<35	Glass Entry

Based on the above, the internal noise level would be between 33-34 dB(A). When comparing to the criteria in SPP 5.4, compliance is achieved with the 40 dB(A)  $L_{Aeq(day)}$ . Therefore, no further noise amelioration is required.

# **APPENDIX A**

## PLANS







Harley Dykstra<sup>®</sup>

PLANNING & SURVEY SOLUTIONS

# APPENDIX G

# SITE & SOIL EVALUATION REPORT



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# Site and Soil Evaluation Report

## Appraisal of site: Lot 128 South Western Highway, Byford



Prepared by Dr Ross Mars.  
December 2, 2021.

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**CHUBB**<sup>®</sup>

## Certificate of Currency

Elite III Professional Indemnity Insurance

<b>Named Insured</b>	Water Installations Pty Ltd	
<b>Policy Number</b>	MPI0003404	
<b>Policy Period</b>	From:	30/06/2021
	To:	30/06/2022
	Effective:	30/06/2021
	All days inclusive, 4:00 PM LST (Local Standard Time) at the Principal Address.	
<b>Policy Form</b>	Elite III Architects and Engineers Professional Indemnity Insurance Policy 04/21	
<b>Date of Issue</b>	16/06/2021	
<b>Coverage</b>	Professional Services	Environmental Consultant for water drainage for land including survey, assessment and permeability study of soil suitability for drainage.
	Limit of Liability (each Claim and in the aggregate)	\$2,000,000
	Retroactive Date	Unlimited

All the values on this Certificate of Currency are correct as at **16/06/2021** and may only be subject to change within the Policy Period by written agreement between the Insurer and the Insured.

This Certificate is furnished as a matter of information only and does not constitute an insurance contract upon which claims can be made.

The insurance afforded by the policies described in this Certificate is subject to all terms, exclusions and conditions of such policies.

**Chubb. Insured.**<sup>SM</sup>

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# 1. Introduction

Water Installations Pty Ltd has been engaged by Mel Biggs of Aquarius on behalf of builder Parsons Management Group with the view to determine the sizing of the wastewater effluent dispersal area for new buildings on the site. Under the Government Sewerage Policy (GSP) it is a requirement that a Site and Soil Evaluation that addresses the risks of an onsite wastewater system on the environment and public health accompanies all commercial applications.

A field investigation and subsequent report have been undertaken to investigate this possibility.

Recommendations for the monitoring and other management requirements will be made. A number of options are provided for both the treatment system and land application area (LAA). In considering the lot size it is noted that the lot should be of sufficient size to accommodate both the proposed development and have enough land application area as determined by Schedule 2 in the GSP.

Soil type was determined upon investigation. Both desktop and field studies were used to determine soil category, permeability and any constraints that may influence the type of wastewater system as well as the amount of irrigation and dispersal area.

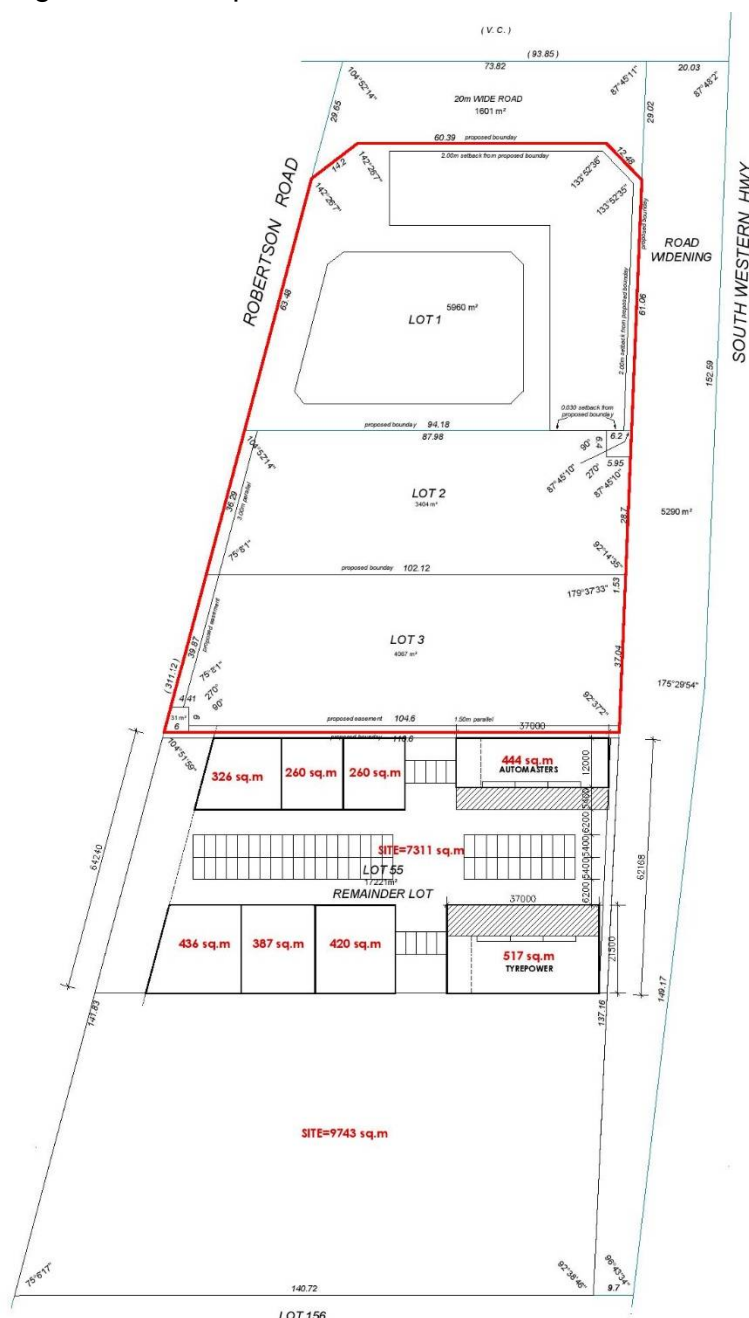


Figure 1.1 Overall site plan or map, showing block details.

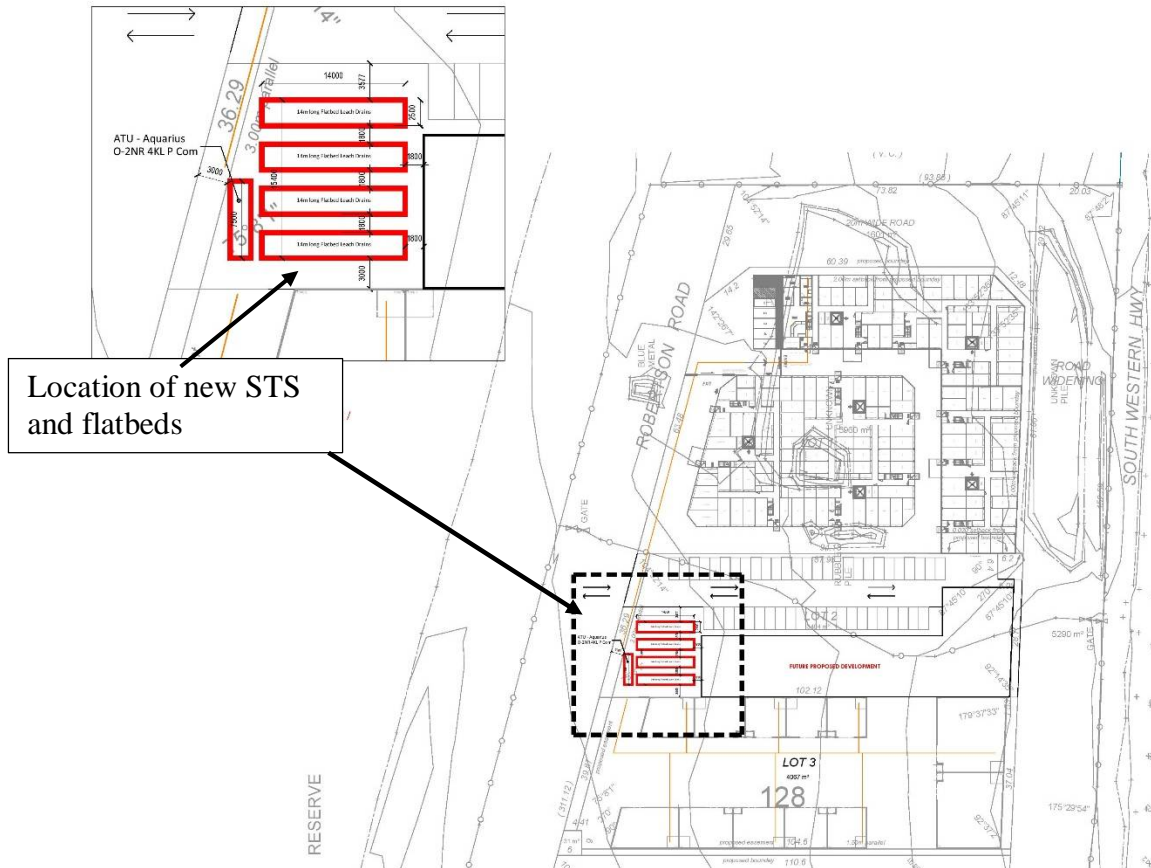


Figure 1.2 Proposed development –new wastewater system.

## 2. Description of site and/or development

The overall site has been cleared, but new buildings are to be constructed as shown in Figure 1.2. Table 2.1 below provides a summary of the proposed development.

Table 2.1 Description of the site and/or development.

Development Characteristic	Description
Site Address	Lot 128 South Western Hwy, Byford
Owner/Developer	Parsons Management Group
Local Government	Shire Serpentine-Jarrahdale
Zoning	Light Industry
Lot size	3.761 ha (37,610 m <sup>2</sup> )
Proposal	New buildings and wastewater system
Water Supply	Mains
Anticipated Wastewater Load	See discussion section for sizing of wastewater plant and anticipated daily volume.
Availability of Sewer	The area is unsewered and highly unlikely to be sewerred for several years, if at all.
Development located within (tick as appropriate)	<input type="checkbox"/> Public drinking water source area <input checked="" type="checkbox"/> Sewage sensitive area <input type="checkbox"/> Neither Not in the MRS Water Catchment Area



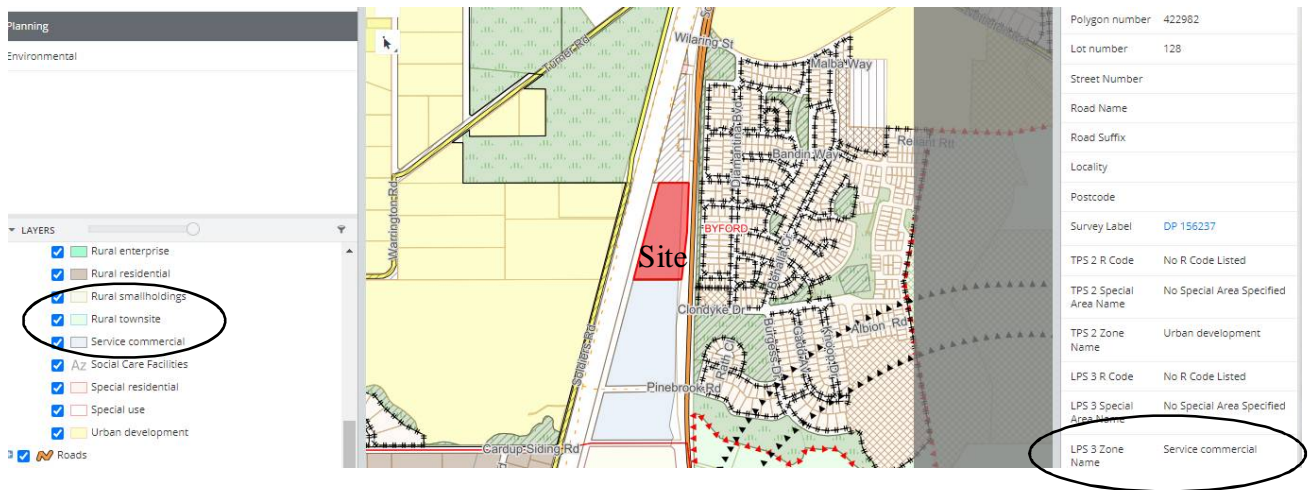


Figure 2.1 Local zoning. Whole of block is deemed Service commercial.

### 3. Site and soil assessment

Water Installations undertook the site investigations on Wednesday November 17, 2021.

#### 3.1 Site

Table 3.1 summarises the key features of the site. Based on the most constraining site features (landform and drainage), the overall land capability of the site to sustainably manage all effluent onsite is satisfactory.

**Note:**

- The site is not in a special water supply catchment area. Not in the MRS Water Catchment Area. The site experiences low stormwater run-on as topsoil has good infiltration and drainage.
- The risk of effluent transport offsite is very low.

**Procedure**

Two test pits were dug with an excavator to a depth of at least 2 m wherever possible. Permeability determination was undertaken with a hand auger. Soil samples were randomly selected from the excavated spoil, but typically from the middle to lower areas of soil profile. Topsoil was not included. Location of test pits is shown in Figure 3.1.

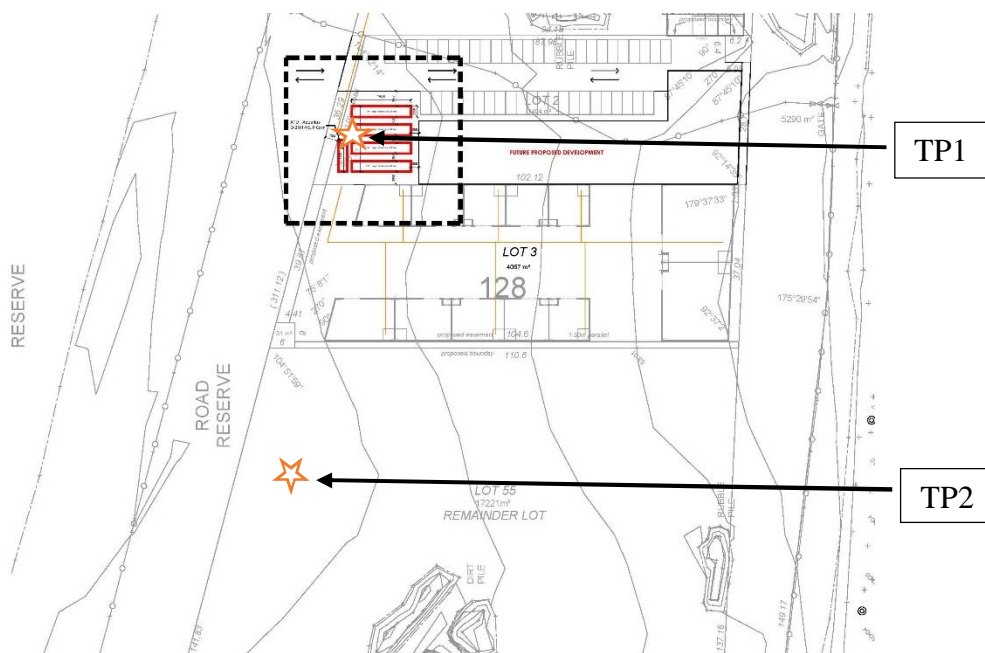


Figure 3.1 Map of test pit locations.

**Table 3.1: Site Assessment**

<b>Feature</b>	<b>Description</b>	<b>Level of Constraint</b>	<b>Mitigation Measures</b>
<b>Climate</b>	Average annual rainfall – Byford historical records show an average of 812 mm. Average no. of rain days per year: 109. Average annual pan evaporation is about 1700 mm.	Low	NN*
<b>Vegetation</b>	Mixture of grasses and weeds in small pockets on site. Mostly cleared and fill placed over site.	Nil	NN
<b>Slope, Erosion and Landslip</b>	Slope is gentle and fairly consistent over whole of block (1 to 2°), so no evidence of sheet or rill erosion, and the erosion hazard is low. No evidence of landslip and landslip potential is low.	Low	NN
<b>Landform</b>	Typical soils of the eastern coastal plain. In this case Guildford clay, as part of the Pinjarra Plain. Natural ground has pedality earthy, small clumps. Gentle slope planar.	Medium	Any subsurface or substrata irrigation is suitable in sandy fill, but flatbeds or dripline in natural ground.
<b>Rock Outcrops</b>	No evidence of granite or laterite surface rocks or outcrops. Mixture of soils as fill. Lateritic, gravelly clay in natural ground.	Low	Do not anticipate any issues with tank installation.
<b>Exposure and Aspect</b>	Subject to good wind and sun exposure over all site.	Low	NN
<b>Drainage</b>	Some signs of surface dampness, with hydrophilic vegetation, nearby over lower part of natural ground (TP2), but not in the proposed effluent management area or surrounds (TP1 area). Sandy to gravelly soil was observed in both test pits, and both had water seepage at depth.	Medium	Adopt DIR or DLR as per permeability studies. Flatbeds and dripline preferred.
<b>Groundwater</b>	Groundwater seepage at 1.5 m natural ground and at 2.2 m in fill area.	Medium	Shallow flatbeds and dripline preferred.
<b>Imported Fill</b>	A range of soils as imported fill material was observed across the whole site. See Figure 5.1 for photograph and description that follows.	Medium	Soil varies over site and permeability likewise. Onsite excavation during installation may reveal best location (in sandy fill).
<b>Land Available for LAA**</b>	Considering all the constraints and buffers, the site has ample suitable land for the land application area for treated effluent. The preferred effluent management area is on the western side of block.	Nil	NN
<b>Slope of LAA</b>	The proposed effluent management areas are, or can be, reasonably level.	Low	NN
<b>Run-on and Runoff</b>	Negligible stormwater run-on and minor run-off hazard. Irrigation areas will not require bunding.	Low	NN
<b>Buffer Distances</b>	All relevant buffer distances in the Code are achievable in the proposed effluent management area.	Low	NN

\*NN: not needed    \*\*LAA: Land Application Area

### 3.2 Soils

#### Methods

The site's soils have been assessed for their capability for onsite sewage management by a combination of soil survey, permeability studies, laboratory assessment and a desktop review of published soil survey information as outlined in the pages that follow.

#### Results

##### Published Soils Information

Suspected soils of the site have been investigated via number of sources, such as web-based site DPIRD Natural Resource Information and a publication from the Dept of Agriculture and Food.

From Figures 3.2 and 3.3, soils typically found in the region are Bassendean sands and Guildford clay – as part of the Pinjarra Zone system.

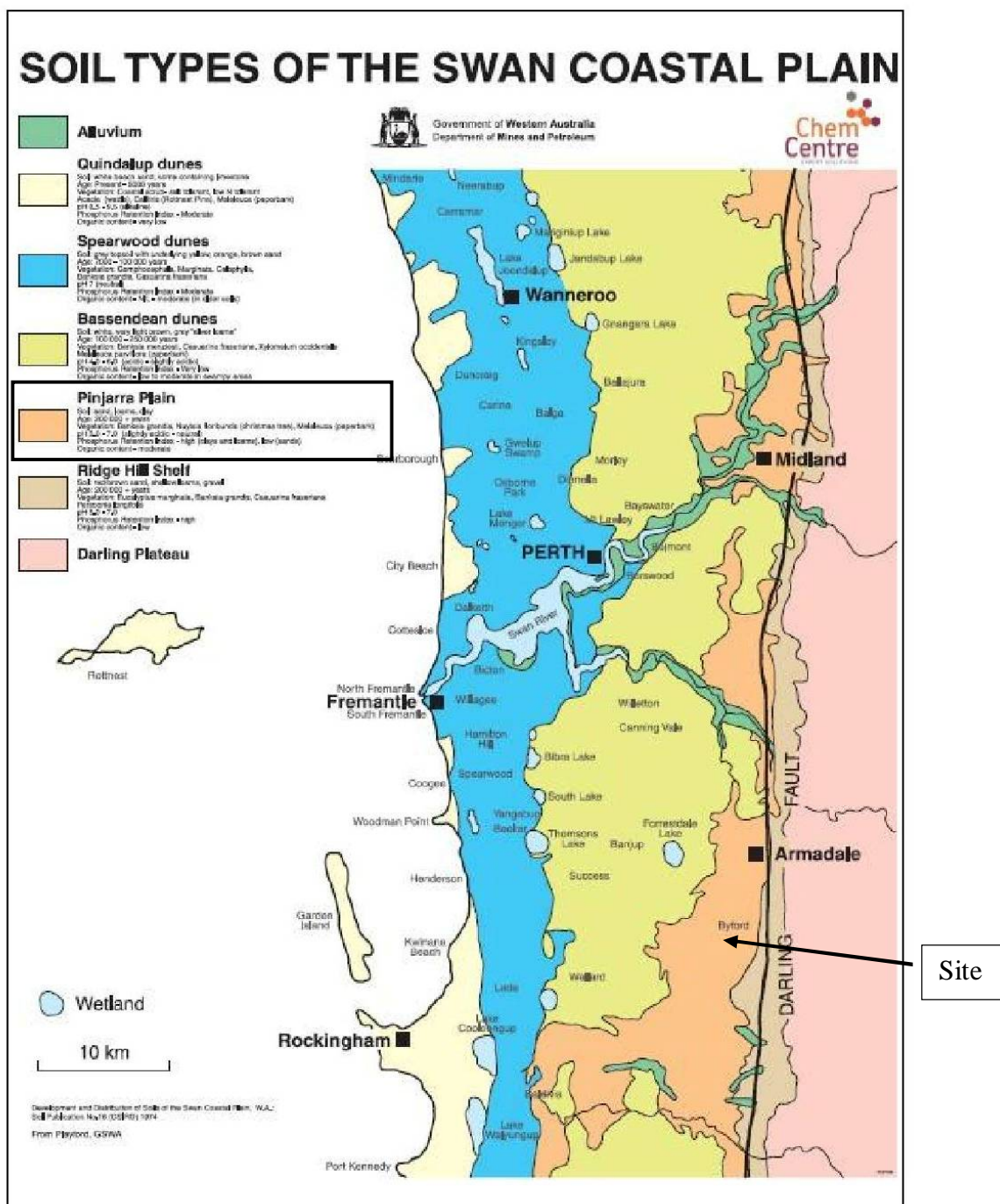


Figure 3.2 Soils of the surrounding area. Area marked. Source ChemCentre.

Soil identified as possible mix Bassendean sand and Pinjarra system (including Guildford clay). The surface of the Pinjarra Plain is flat to very slightly undulating and consists predominantly of Pleistocene fluvial sediments and some Holocene alluvium associated with major current drainage systems.

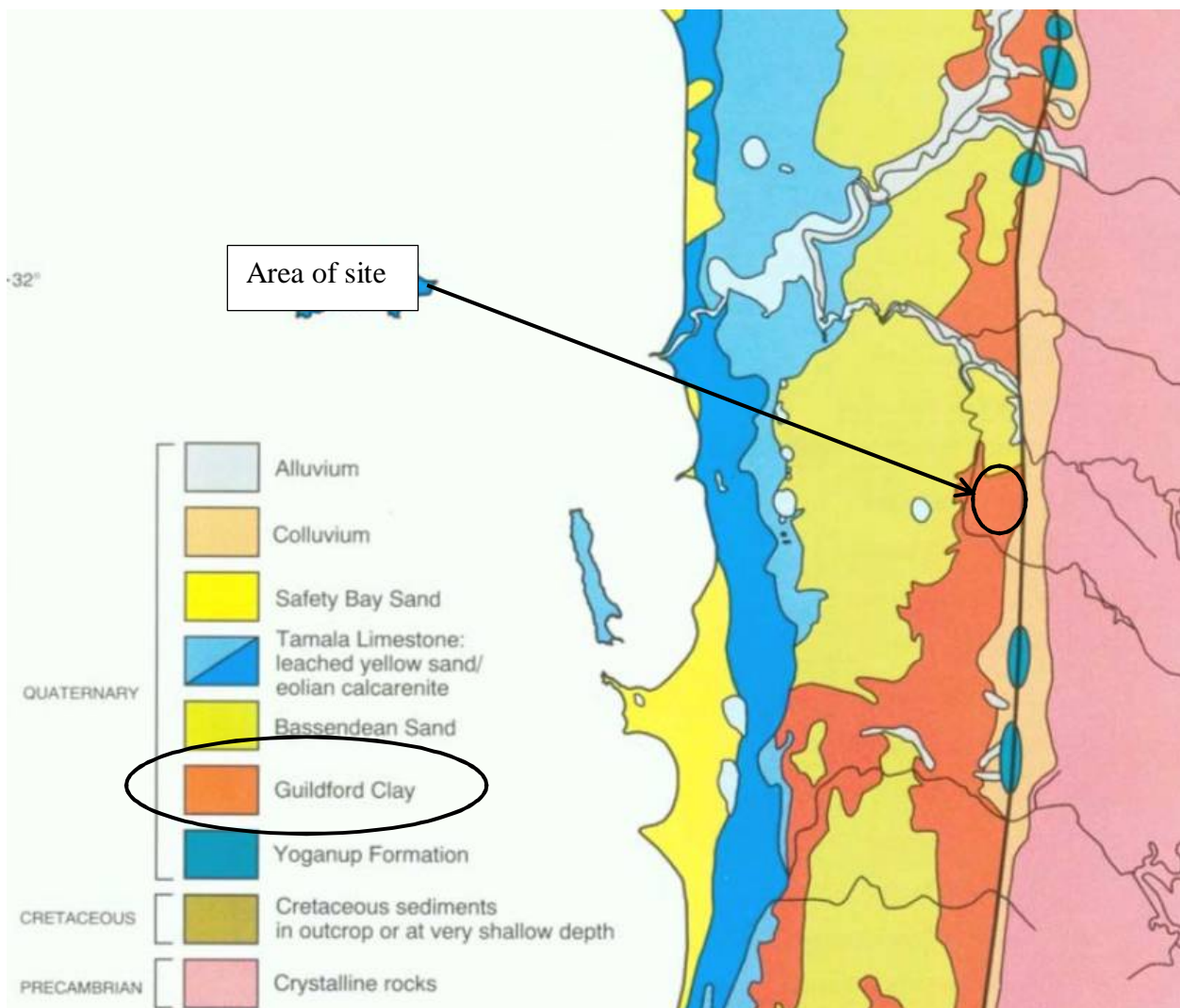
The Guilford Formation or Pinjarra Plain landform is the low lying and flat area found to the east of the Swan Coastal Plain (SCP), mostly south of the Swan and Canning Rivers. This landform is primarily of alluvial origin, formed by the major rivers that dissect the SCP. In effect, they are the floodplain of these rivers.

The Pinjarra zone is confirmed from the Shire Serpentine-Jarrahdale Intramaps website (Figures 3.4 and 3.5) which also suggest that the site may be Forrestfield complex rather than Guildford complex soils and vegetation.

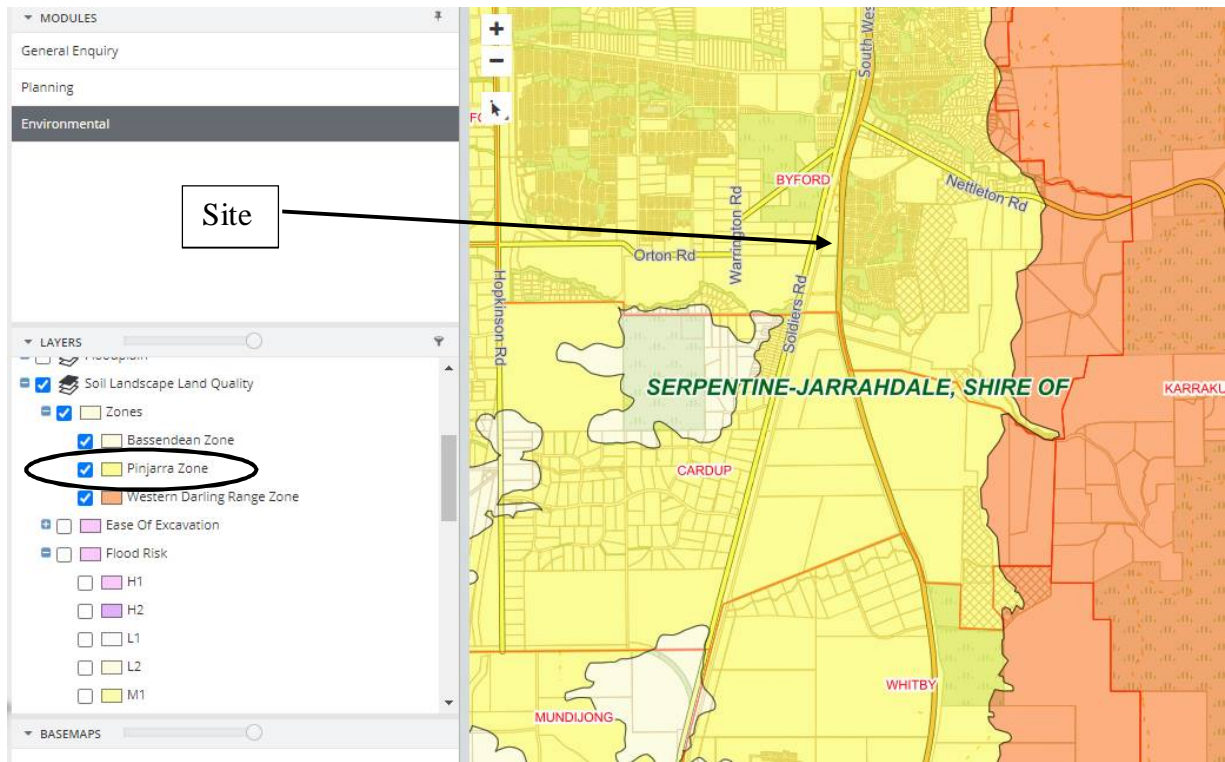
The Forrestfield complex is a series of lateritised low relief spurs forming the foothills of the Darling Scarp. They are composed of fossil shoreline bench sediments, holocene colluvium and narrow bands of alluvial deposits. Typically, the landscape soils are very gently to gently inclined footslopes with well-drained gravelly yellow or brown duplex soils with sandy topsoil.

Whilst the natural soils are primarily clay-based, there is also sand in the soils, which come from sand blown inland from the dunes in the west. This landform lies over the top of the eastern most Bassendean dunes. The clay nature of these soils and the generally low relief means that they are naturally poorly drained and hold surface water for most of winter, and this seems evident from site observations.

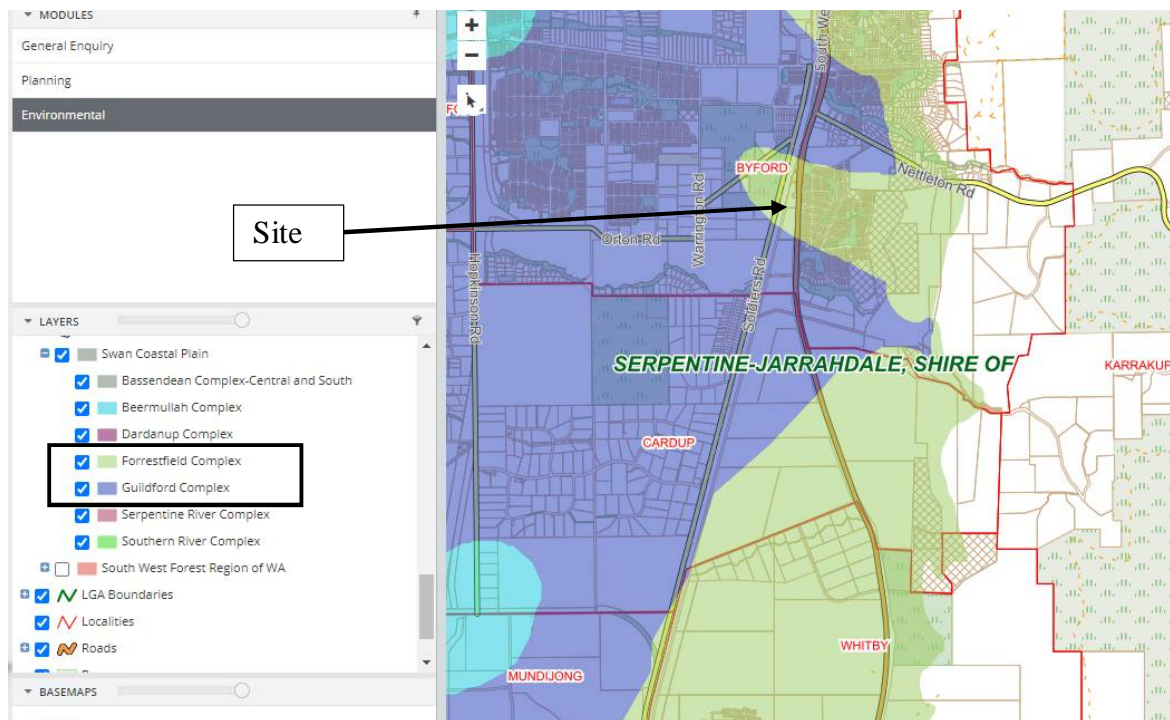
Bassendean and Pinjarra soils are acidic, typically in the pH range of 5 to 6.



**Figure 3.3 Possible soils for site: Guildford clay. Source: Dept Agriculture and Food.**



**Figure 3.4 Soil landscape zones. Source: Shire Serpentine-Jarrahdale Intramaps.**



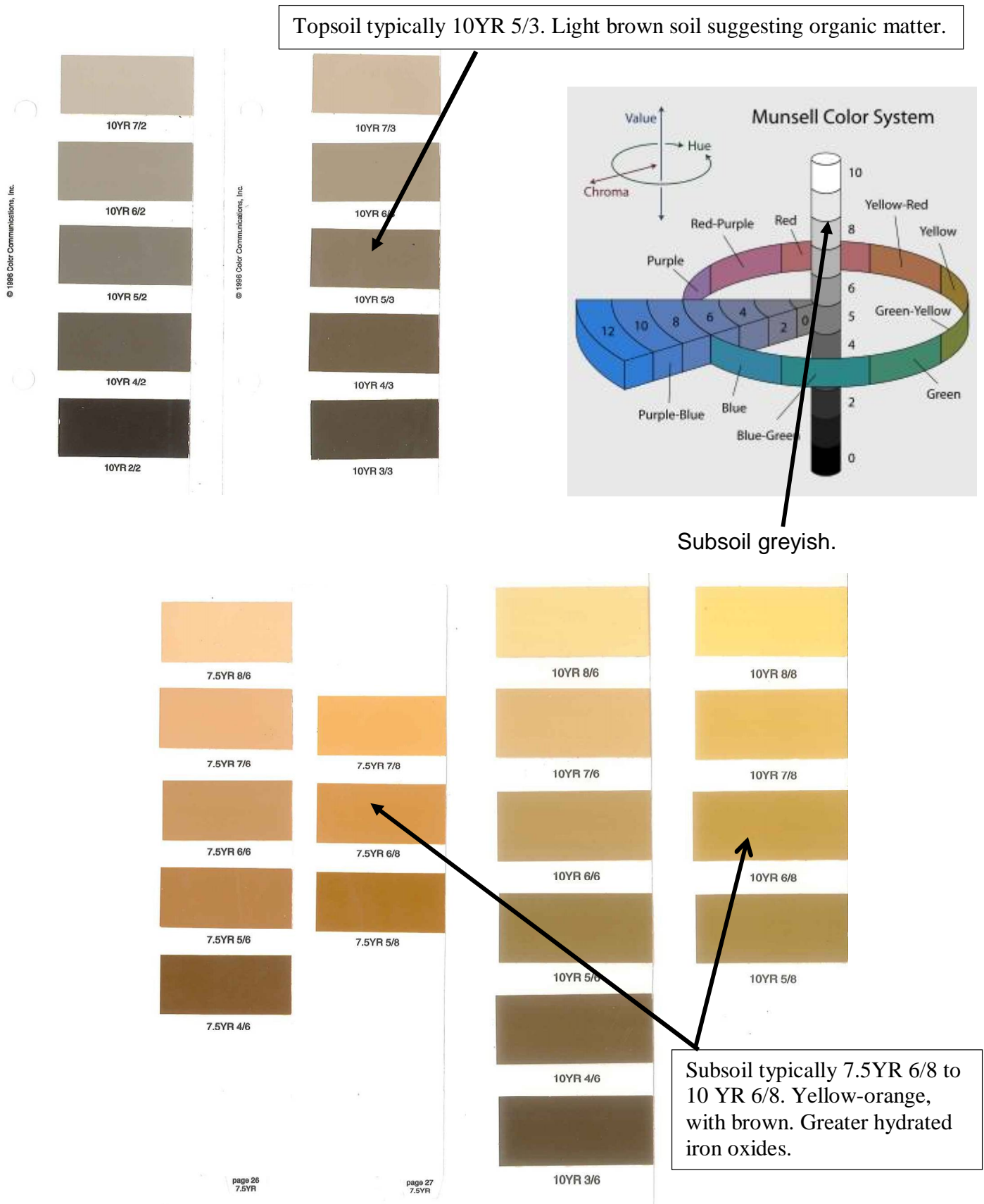
**Figure 3.5 Soils of the Swan Coastal Plain. Source: Shire Serpentine-Jarrahdale Intramaps.**

**Soil Survey and Analysis**

A soil survey was carried out at the site to determine capability for the application of treated effluent. Soil investigations were conducted at two locations, as shown in Figure 3.1, using excavator-dug test pits (TP1 and TP2) endeavouring to reach 2 m depth. No hard digging was encountered in any test pits, but excavation stopped after required depth was achieved and/or water was encountered. Profile descriptions are provided in the relevant sections that follow.

Generic samples of soil from each test pit were collected for subsequent laboratory analysis of pH, electrical conductivity, nutrient content, Phosphorus Retention Index and Emerson Aggregate Class or similar for dispersion. Various tables in each section describe the soil constraints in detail for each of the soils encountered.

### Munsell soil colour



**Figure 3.6 Typical Munsell colours of soils present on site.**

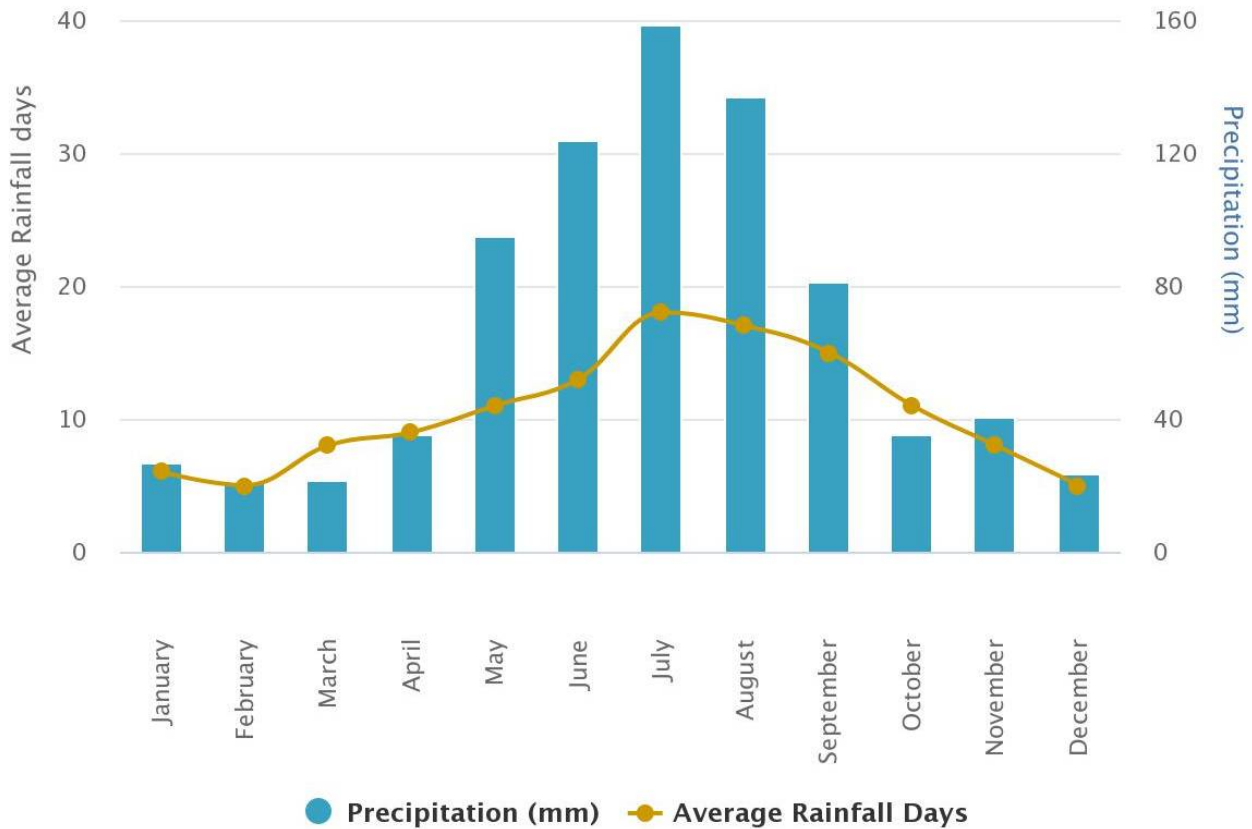
### Comment on soil colour

The above illustration is an overview of both imported soil and natural ground. Much of the imported fill was Bassendean sand, typically greyish in colour, while the natural ground was more orange-brown (Pinjarra zone, Guildford clay, gravelly soil).

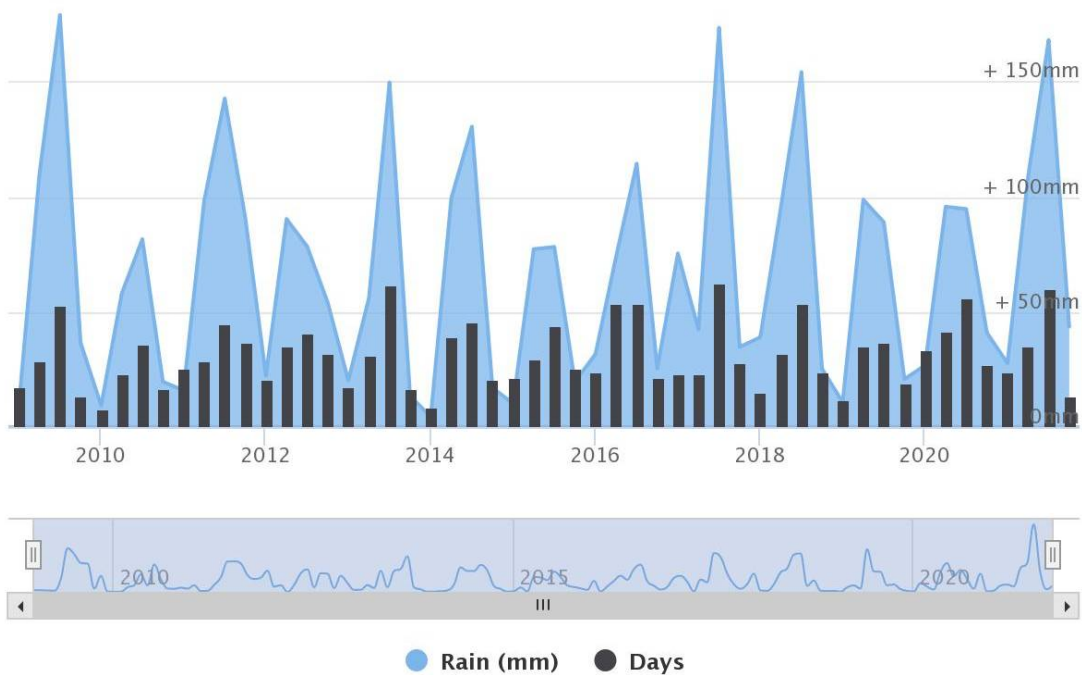
### 3.3 Hydrology

A review of published literature was used to assess any possible constraints about the site, and then to make recommendations of appropriate wastewater treatment and land application areas.

In particular, the Government Sewerage Policy (GSP) requires that an onsite sewage system is not to be located within any area subject to inundation and/or flooding in a 10 percent Annual Exceedance Probability (AEP) rainfall event.



**Figure 3.7 Annual rainfall for Byford.**



**Figure 3.8 Typical rainfall amount and rainy days for Byford.**

From Figures 3.7, 3.8 and 3.9 it is clear that most rainfall falls in winter but rainfall does fall in every month, and this pattern is consistent from year to year. Furthermore, even in winter, the number of rainy days does not exceed 18 or about two-thirds of each month. Annual rainfall 812 mm, number of rainy days = 109.

### Byford Long-Term Averages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Max (°C)	31.4	31.5	29.6	25.8	22.0	19.1	18.0	18.7	20.2	22.9	26.4	29.3	24.5
Mean Min (°C)	16.8	17.1	15.6	12.5	9.3	7.5	7.1	7.3	8.3	9.9	12.7	14.8	11.5
Mean Rain (mm)	15.8	18.1	17.2	42.0	105.9	151.6	174.8	127.4	84.4	47.8	28.6	10.4	812.6
Mean Rain Days	2.5	2.4	3.9	7.3	12.3	15.4	17.9	15.7	13.6	9.0	6.1	3.3	108.9

Figure 3.9 Long-term climate averages for Byford.

Data for floodplain mapping, the groundwater map (Dept Water website) and Sewage sensitive areas (Dept Planning, Lands and Heritage) are shown later.

Peak flows for various ARI events - the Intensity Frequency Duration (IFD) data - for Byford is shown in Figures 3.10 and 3.11. Taking the duration as 5 minutes and the probability of a severe rainfall event as 10% (AEP 10), then the graph and table suggest a Design Rainfall Depth of about 10 mm. This is consistent with the anticipated maximum rainfall intensity for Byford. Maximum rainfall about 175 mm for July = 9.7 mm/day average for the 18 rain days in that month.

#### IFD Design Rainfall Depth (mm)

Issued: 23 November 2021

Rainfall depth for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).  
[FAQ for New ARR probability terminology](#)

Table | Chart Unit: mm

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	1.85	2.04	2.68	3.14	3.61	4.26	4.79
2 min	3.26	3.57	4.58	5.31	6.07	7.11	7.96
3 min	4.36	4.78	6.17	7.18	8.21	9.64	10.8
4 min	5.26	5.78	7.51	8.75	10.0	11.8	13.2
5 min	6.02	6.63	8.65	10.1	11.6	13.7	15.3
10 min	8.68	9.62	12.7	14.9	17.1	20.2	22.7
15 min	10.5	11.6	15.3	17.9	20.6	24.4	27.4
20 min	11.8	13.1	17.2	20.2	23.2	27.5	30.8
25 min	12.9	14.3	18.8	22.0	25.3	29.9	33.6
30 min	13.9	15.4	20.2	23.6	27.1	32.0	36.0
45 min	16.3	17.9	23.4	27.3	31.4	37.1	41.7

**Label:** Byford  
**Latitude:** 32° 14' 06"  
 [Nearest grid cell: 32.2375 (S)]  
**Longitude:** 116° 00' 16"  
 [Nearest grid cell: 116.0125 (E)]

Figure 3.10 Rainfall depth for duration for Annual Exceedance Probabilities (AEP)

Given an AEP 10% and storm duration of 5 minutes then the anticipated rainfall intensity is 121mm/hr as calculated below. Using this value and the runoff coefficient for a grassed area (Figure 3.12) then a runoff flow value can be calculated. The catchment area is deemed to be about the size of the LAA so that the impact of a severe rainfall event can be determined.

$$\text{Rainfall intensity} = \frac{\text{Design rainfall depth (mm)}}{\text{Duration (hrs)}}$$

$$\text{Duration} = 5 \text{ mins} = 0.0833 \text{ hr}$$

$$\text{Rainfall intensity} = \frac{10.1}{0.0833} = 121 \text{ mm/hr}$$



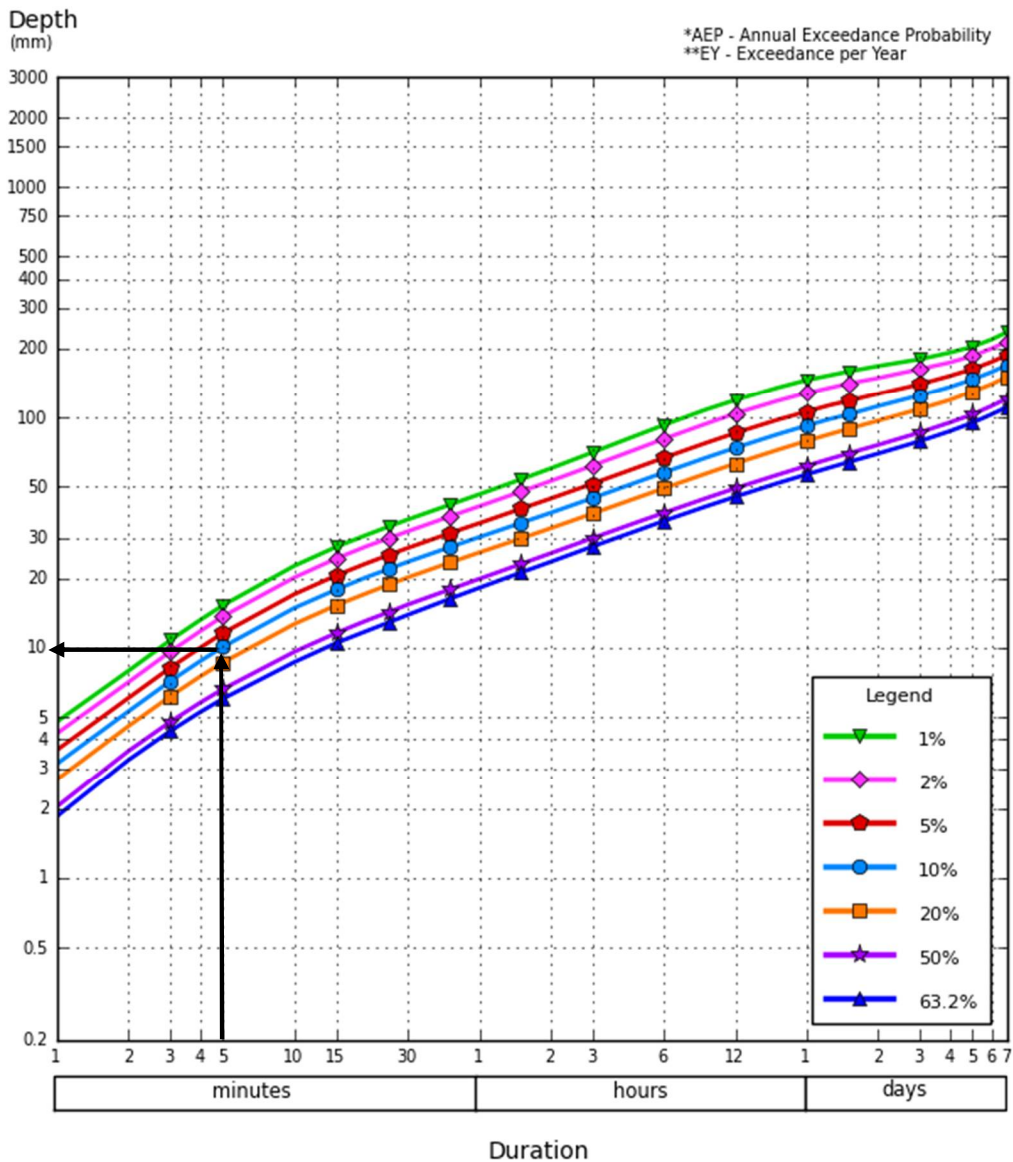


Figure 3.11 Graph of Design Rainfall Depth (mm) at various AEP levels.

COEFFICIENT OF RUNOFF = RUNOFF / RAINFALL	
SOIL TEXTURE	COEFFICIENT OF RUNOFF
Concrete, Roof, or Asphalt	1.00
Clay – Bare	0.70
Clay – Light Vegetation	0.60
Clay – Dense Vegetation	0.50
Gravel – Bare	0.65
Gravel – Light Vegetation	0.50
Gravel – Dense Vegetation	0.40
Loam – Bare	0.60
Loam – Light Vegetation	0.45
Loam – Dense Vegetation	0.35
Sand – Bare	0.50
Sand – Light Vegetation	0.40
Sand – Dense Vegetation	0.30
Grass Areas	0.35

Runoff flow (L/s) = CIA/3600

Where:-

C = Coefficient of runoff, I = Rainfall Intensity (mm/hr), A = Catchment Area (m<sup>2</sup>)

C = 0.35 (grass areas), I = 121 mm/hr and A= 200 m<sup>2</sup> (one zone/half of proposed LAA)

$$\text{Flow} = \frac{0.35 \times 121 \times 200}{3600} = 2.35 \text{ L/s}$$

With a slope of about 1% then the velocity of water movement across the sandy loam grassed-covered landscape would be about 1 m/s (assuming width of irrigation area 10 m and 10 mm depth of water)..

This poses no threat to the land application area, as water will be able to drain away through the natural ground.

Figure 3.12 Runoff coefficients for soils.

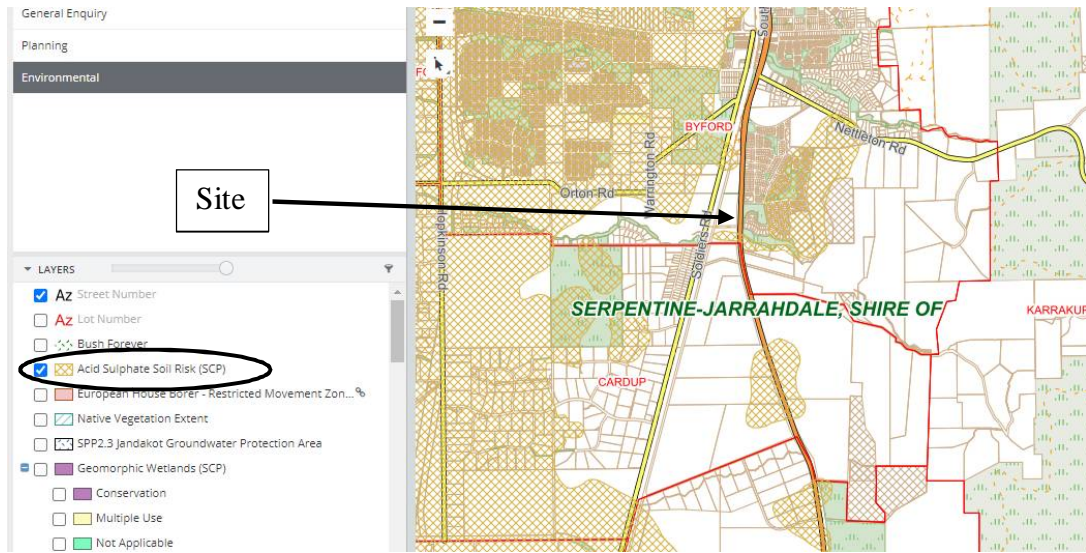


Figure 3.13 Likelihood of acid sulphate soils. Source: SSJ Intramaps.

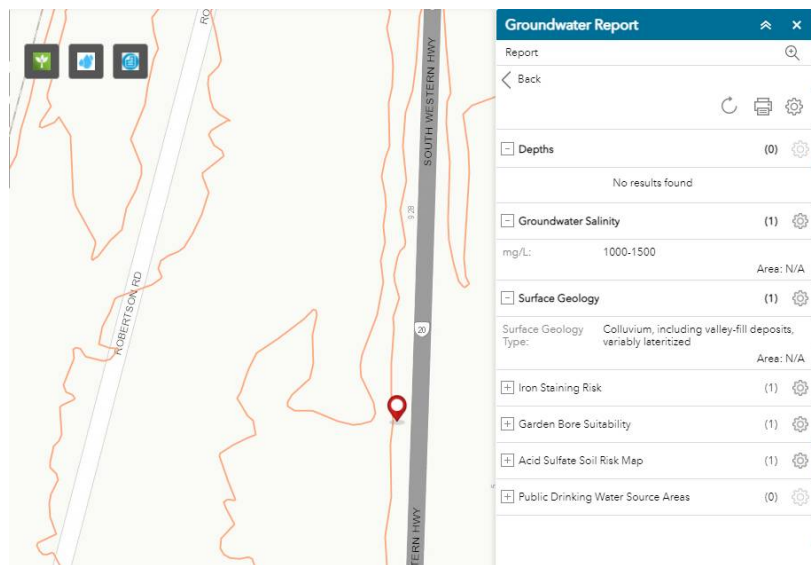


Figure 3.14 Depth to water table. Source: Perth Groundwater Map.

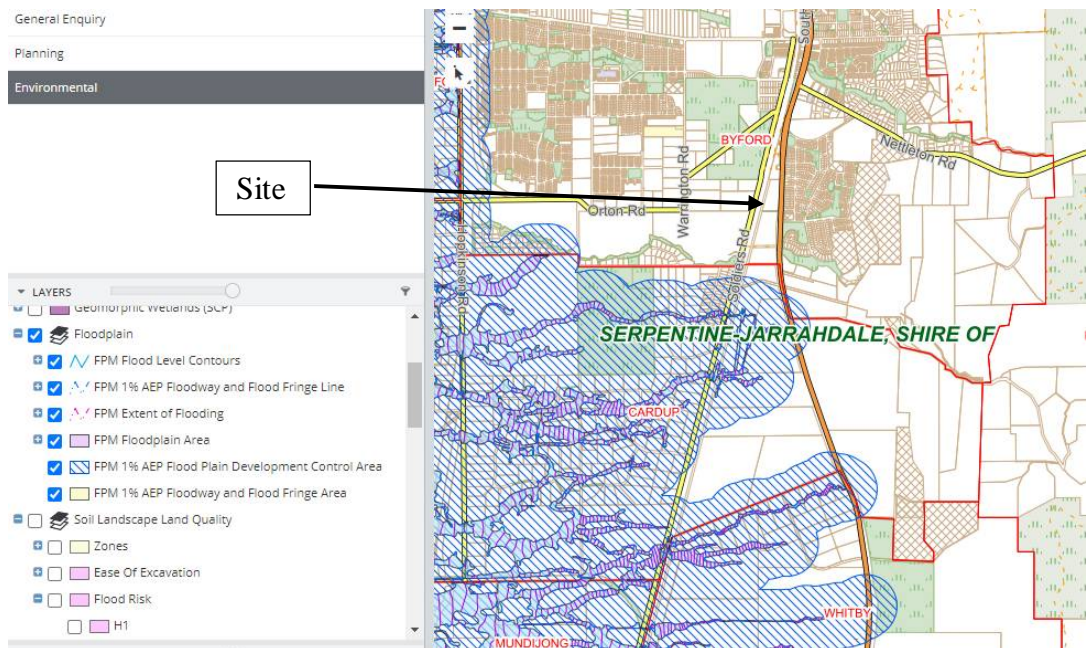
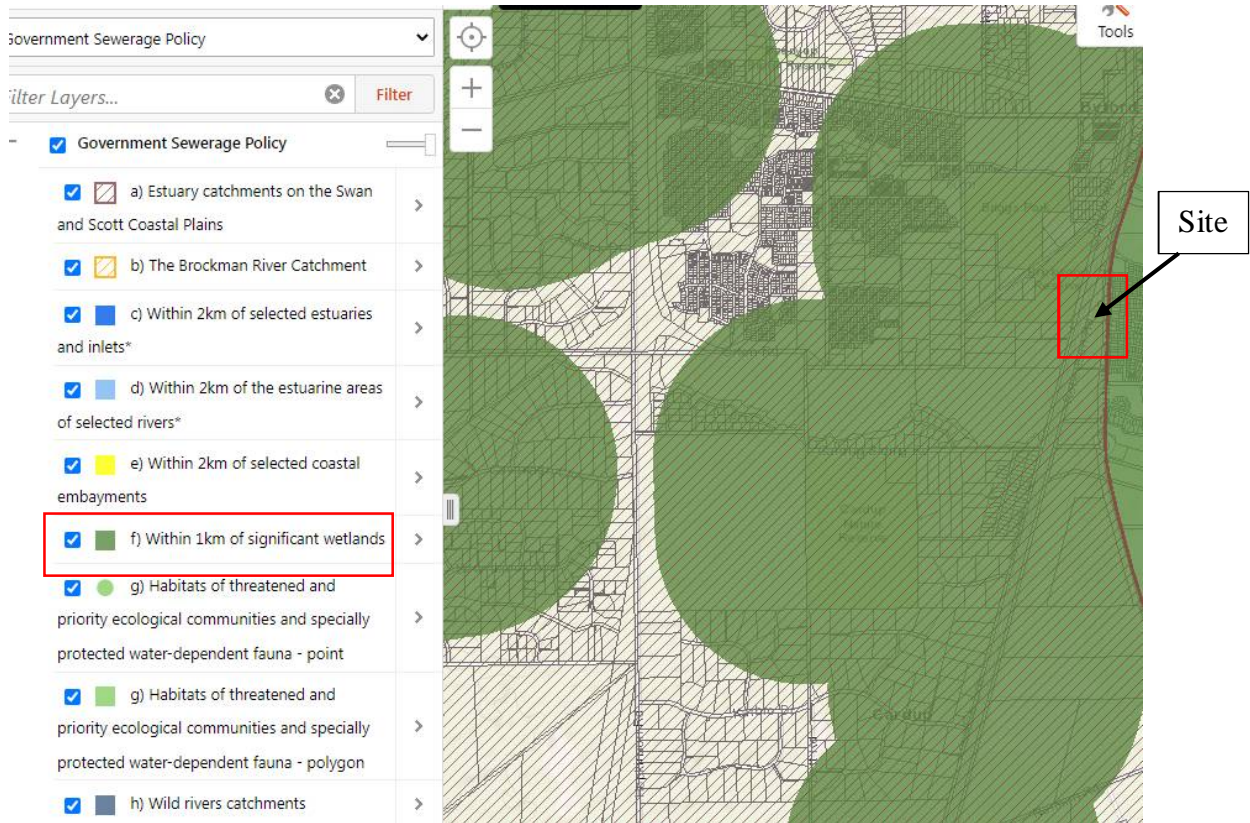
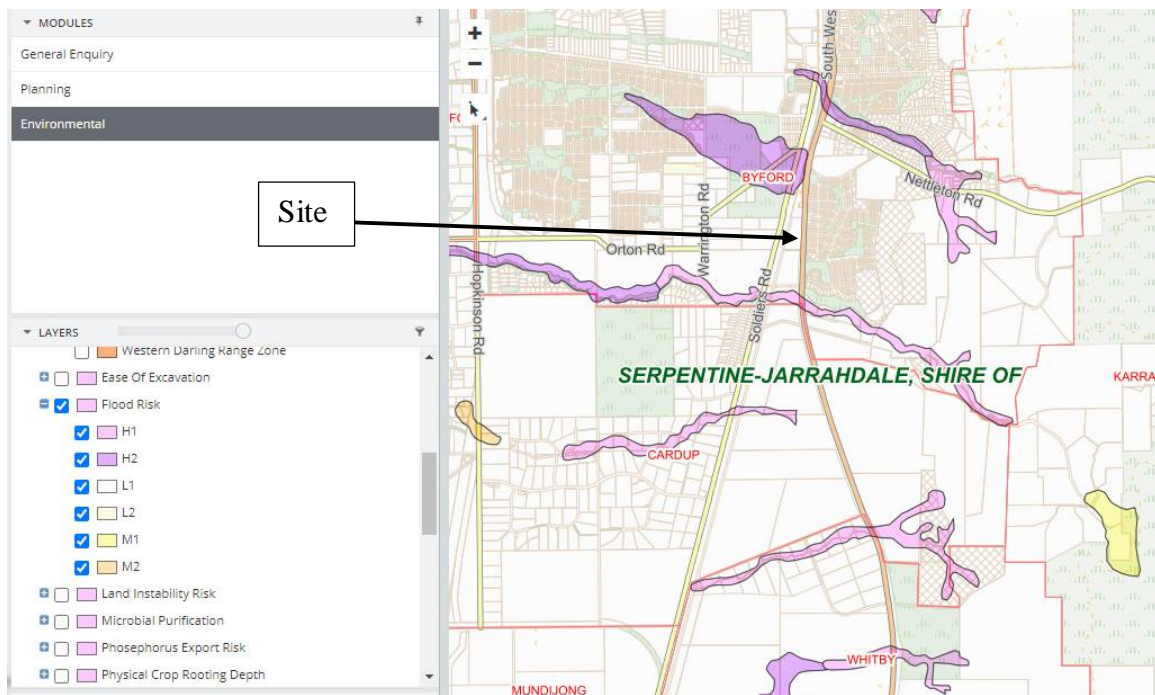


Figure 3.15 Floodplain hazard potential. Source: Shire Serpentine-Jarrahdale Intramaps.



**Figure 3.16 Sensitive Sewage Areas. Source: Dept Planning, Lands and Heritage.**



**Figure 3.17 Flood risk mapping. Source: Shire Serpentine-Jarrahdale Intramaps.**

**Comments on Figures 3.13 to 3.17**

Figure 3.13 suggests no risk of acid sulphate soils while Figure 3.14 shows the water table has not been determined. Figures 3.15 and 3.17 suggests no risk of floodplain issues or flooding risk.

Figure 3.16 shows that the site is within the Swan River catchment area and near a creek, but not within 1 km of any major waterways (eg Cardup Brook, Serpentine River) which typically is more of a concern as a sewage sensitive area.

**Table 3.2 Laboratory Test results. CSBP Bibra Lake.**

Name		TP 1	TP 2
Code		18/11/21	18/11/21
Customer		Byford	Byford
Depth		0-10	0-10
Colour		DKGR	GRYW
Gravel	%	0	20-25
Texture		1.5	2.5
Ammonium Nitrogen	mg/kg	13	2
Nitrate Nitrogen	mg/kg	< 1	2
Phosphorus Colwell	mg/kg	13	< 2
Potassium Colwell	mg/kg	51	53
Sulfur	mg/kg	25.2	112.1
Organic Carbon	%	1.53	0.20
Conductivity	dS/m	0.189	0.171
pH Level (CaCl <sub>2</sub> )		6.5	5.6
pH Level (H <sub>2</sub> O)		7.3	6.2
DTPA Copper	mg/kg	0.47	0.16
DTPA Iron	mg/kg	89.30	10.20
DTPA Manganese	mg/kg	7.41	0.26
DTPA Zinc	mg/kg	1.49	0.05
Exc. Aluminium	meq/100g	0.080	0.120
Exc. Calcium	meq/100g	7.88	1.28
Exc. Magnesium	meq/100g	1.30	4.85
Exc. Potassium	meq/100g	0.13	0.13
Exc. Sodium	meq/100g	0.17	0.72
Boron Hot CaCl <sub>2</sub>	mg/kg	0.46	0.41
Phosphorus Retention Index		9.1	> 1000.0
Dispersion Index		12.00	0.00

### General Comments

Soil is slightly acidic, slightly high in iron, as expected due to imported Bassendean sands and Darling Range lateritic clays used as fill over the site. This is also reflected in the natural ground (Guildford clay, Forrestfield complex) for TP2. All other nutrients very low (unfertile soil). Low phosphorus retention index for fill soil but very high for natural clayey ground. Low dispersion, as expected.

Results for cations calcium and magnesium were used to compare to sodium to enable the Sodium Absorption Ratio (SAR) to be calculated. SAR is used to determine the sodicity of a soil and an assessment of any dispersion of clay aggregates. No dispersion is found in soils with a SAR value less than 3. The exchangeable sodium percentage (ESP) measures the proportion of cation exchange sites occupied by sodium. Soils are considered sodic when the ESP is greater than 6%, and highly sodic when the ESP is greater than 15%.

$$\text{SAR} = \frac{[\text{Na}]}{\sqrt{\frac{1}{2} [\text{Ca} + \text{Mg}]}}$$

$$\text{ESP} = \frac{[\text{Na}] \times 100}{[\text{Ca} + \text{Mg} + \text{K} + \text{Na}]}$$

**Table 3.3 Calculations of SAR and ESP values.**

Soil/site	Calcium meq/L	Magnesium meq/L	Potassium meq/L	Sodium meq/L	SAR	ESP
1. TP1	78.8	13.0	1.3	1.7	0.25	1.79%
2. TP2	12.8	48.5	1.3	7.2	1.31	10.31%

## 4 Test Pit Results

**4.1 Test pit 1** GPS 32°14'05.81 S, 116°00'16.43 E

Altitude 55 m. Slope 1°.



**Figure 4.1** Soil profile for test pit 1. Depth achieved 2.2 m before excavation stopped (but no hard digging). Sandy soil seen shown in these photographs.

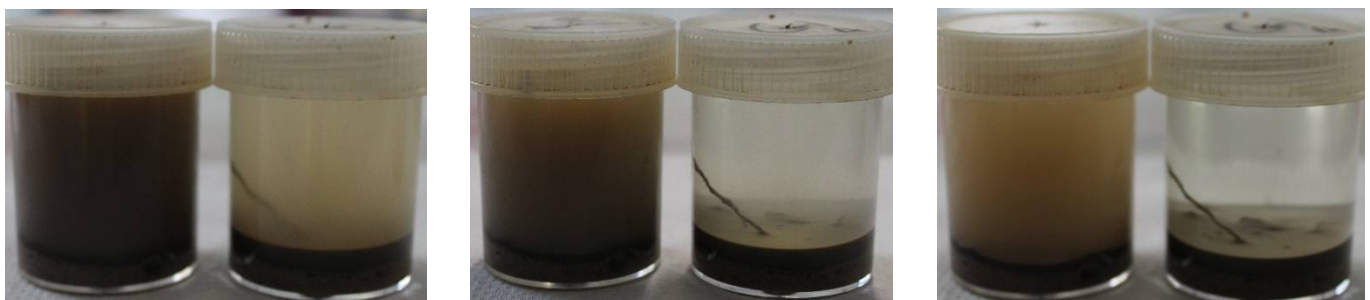


**Figure 4.2 (L)** Excavated soil showing layers. **(R)** Water seepage at 2.2 m.

### Comments on TP 1

Sandy soil was found throughout the profile, typically in layers as indicated in Figure 4.2. Mild water seepage at 2.2 m.

### *Dispersion and gypsum responsiveness*



**Figure 4.2** Dispersion and gypsum responsiveness TP1. In each photo the RHS jar is soil in gypsum solution. LHS jar is soil in water. **(L)** after 15 mins, **(M)** after 2 hrs, **(R)** after 20 hrs.

**Comments on dispersion of soils TP1**

Mild dispersion is evident from jar test where soil in water stayed murky, even after 20 hours. There is a good response to gypsum as shown, even after only 15 minutes, suggesting that this could be used to enable better water infiltration in irrigation area. However, it is probably not necessary to apply it as permeability is good. CSBP = 12 (slight dispersion, the use of gypsum is beneficial).

**Permeability studies**

A sample of soil from the profile was taken and a simple ribbon test performed: the results of which are shown in Table 4.1. A constant head permeameter was employed to measure the infiltration rate into the soil, and the results are summarised in Table 4.2.

**Soil category by Permeability**

Use of permeameter to measure water movement into the soil as per ASNZS 1547:2012.

Depth of auger hole = 50 cm      Depth of water in auger hole = 40 cm

Average radius of auger hole = 4.5 cm.    Depth to any impermeable layer (if known) > 2200 mm

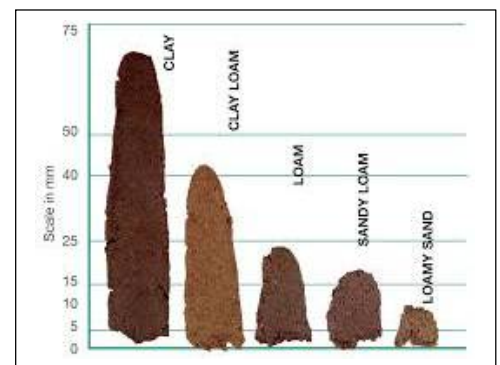
Soil was  wet     moist    or     dry at time of investigation.

**Soil category by Ribbon test**

Estimated soil category by Ribbon test:

**Table 4.1 Results of ribbon test. TP1**

Site test 1	Generic sample
Ribbon length (mm)	<15
Feel of sample	Sandy, gritty
Soil category	1 – sandy loam



**Table 4.2 Results of permeability studies TP1.**

Time (secs)	Level in tube (mm reading)	Drop in level (mm)
Start 0	620	
15	870	250
30	950	80
45	1010	60
60	1080	70
75	1150	70
	Average	280/min
K <sub>sat</sub> (from AS1547)	1.96 m/day	

Outlier - ignore

Soil category from permeability readings: 3 (moderately structured loam).

# Ksat VALUES

Instrument Data	
Reservoir internal Diameter (mm)	==> 45
Breather pipe Outer Diameter (mm)	==> 0
Test Hole radius (mm)	==> 45
Water Depth in Test Hole (mm)	==> 400

Test Results				
Water Fall Rate (mm)/min		Flow Rate cm <sup>3</sup> /min	Ksat cm/min	Ksat m/day
280	28	445.32	0.1362	1.99
281	28.1	446.91	0.1367	1.97
282	28.2	448.50	0.1371	1.97
283	28.3	450.09	0.1376	1.98
284	28.4	451.68	0.1381	1.99
285	28.5	453.27	0.1386	2.00
286	28.6	454.86	0.1391	2.00
287	28.7	456.45	0.1396	2.01
288	28.8	458.04	0.1401	2.02
289	28.9	459.63	0.1405	2.02
290	29	461.23	0.1410	2.03
291	29.1	462.82	0.1415	2.04
292	29.2	464.41	0.1420	2.04
293	29.3	466.00	0.1425	2.05

Figure 4.3 Ksat determination TP1.



Figure 4.4 (L) Ribbon test TP1. (R) Permeability determination (very rapid bubbles).

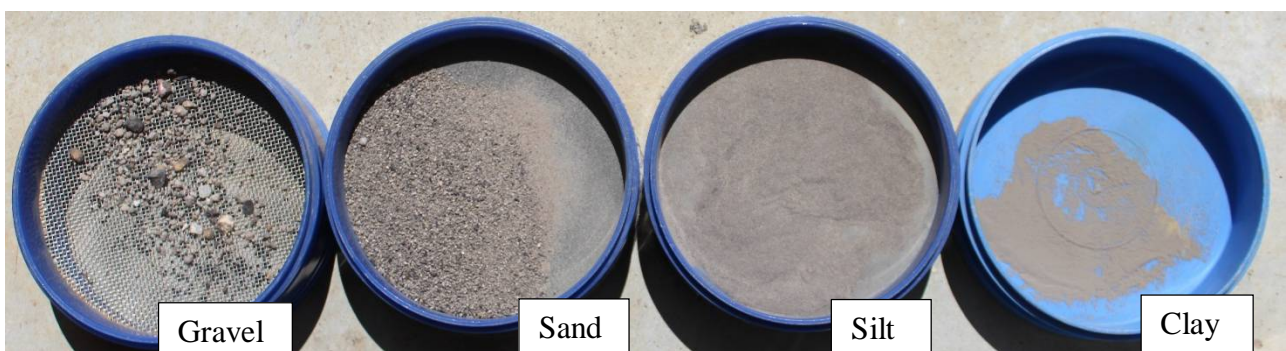


Figure 4.5 Soil fractions for sample TP1.

**Comments**

Soil is sandy loam, with much smaller amounts of silt and clay present. Soil category = 2.



**Figure 4.6 (L) Excavation of Test pit 1, showing location. (R) Moist sandy soil.**

WATER Installations Pty Ltd		Soil Profile Borehole Log		Date: Nov 17, 2021	Test Pit number. TP1
Client, Address: Parsons Management Group. Lot 128 South Western Highway, Byford					
Excavation type: Mini-excavator, hand auger			Groundwater Depth: 2.2 m		
Depth (metres)	Ease of excavation	Graphic Log	Material description and field notes	Moisture	
			<u>Soil Group Name:</u> colour, grain size, other descriptors: Fill sand, mixed <u>Rock Description:</u> type, hardness, structure. Sand (structureless), loam		
0.5	VE	[Dotted pattern]	Dark grey-brown sandy topsoil	D	
1	VE	[Dotted pattern]	Yellow fill sand	M	
1.5	E	[Dotted pattern]	Dark, natural ground. Rotted vegetation smell.		
2	E	[Dotted pattern]	Grey sand	M	
			End of excavation - no refusal but required depth achieved, water seepage	W	

**Key**

[Dotted pattern]	[Dotted pattern]	[Diagonal lines]	[Cross-hatch]	[Dotted pattern]	[Brick pattern]	[Diagonal lines]
Topsoil	Sandy loam	Clayey loam	Clay	Laterite	Parent rock	Gravelly soil

**Ease of excavation**  
 VE very easy E easy F firm H hard VH very hard

**Moisture**  
 D = dry M = moist W = wet (saturated)

**Figure 4.7 Soil profile log TP1.**



**Table 4.3 Soil Assessment – TP1**

Note: these comments are a review of the generic soil fraction. This is both a summary and comments of the laboratory testing as shown in Table 3.2.

Feature	Assessment	Level of Constraint	Mitigation Measures
<b>Cation Exchange Capacity (CEC)</b>	Main cations have low concentration (except iron which is proportionally higher). The calcium/magnesium ratio of about 5:1 is low (magnesium low) but is acceptable for optimal plant growth.	Low	Soil amelioration unnecessary, but occasional fertiliser to vegetation recommended.
<b>Electrical Conductivity</b>	EC and TDs low (121 mg/L). [0.189 dS/m]	Low	Monitoring of EC not necessary
<b>Emerson Aggregate Test</b>	Slightly dispersive in jar test. Class 2. CSBP test result = 12 which suggests mild dispersion.	Low	Soil amelioration unnecessary, but the use of gypsum is beneficial.
<b>pH</b>	6.5 (water 7.3) which is slightly acidic. Would not expect soil conditions to affect any plant growth.	Low	Addition of alkaline wastewater may increase pH level over time, but this is not expected to be a constraint.
<b>Rock Fragments</b>	Nil present. Figures 4.1 and 4.2 show sand and Figure 4.5 shows same in the screen.	Low	No consideration required.
<b>Sodicity (ESP)</b>	Sodium concentration is low - 38 ppm. Exchangeable Sodium Percentage (ESP) 1.79%, (non-sodic <6%).	Low	Long-term soil sodicity monitoring is unnecessary.
<b>Sodium Absorption Ratio (SAR)</b>	Sodium concentration is lower than Magnesium and Calcium concentrations in the tested samples; SAR is low (0.25). Dispersion test confirm low sodicity.  SAR is usually only a problem for dispersion and permeability if value >5.	Low	Sodicity and dispersion issues are not expected to pose a constraint.
<b>Phosphorus Retention Index</b>	9.1. Low PRI, as expected from white/grey sand, but will remove some phosphates.	Low	Nutrient retention system may be required.
<b>Soil Depth</b>	Topsoil: 100 - 150 mm	Low	Shallow subsurface irrigation possible.
	Subsoil: >150 mm. Sand to sandy loam throughout profile. Excavation stopped at 2.2 m depth (water seepage, but no refusal).	Low	Any shallow dispersal method suitable.
<b>Soil Permeability and Design Loading Rates</b>	Measured at 1.96 m/day saturated conductivity ( $K_{sat}$ ) (AS/NZS1547:2012). Category 3 (moderately structured loam); 20 mm/day Design Loading Rate (DLR) for beds (50 mm/d for STS) and 4 mm/d for irrigation system.	Low	NN*
<b>Soil Texture and Structure</b>	Sandy loam (Category 2). Texture = 1.5 loam. Gravel 0% (CSBP)	Low	NN
<b>Watertable Depth</b>	Groundwater encountered, pit terminated at 2.2m.	Low	Any shallow dispersal method recommended, such as flatbeds or dripline

\*NN: not needed

**4.2 Test pit 2** GPS 32°14'08.60S, 116°00'15.52E.

. Altitude 54 m. Slope 1.5°.



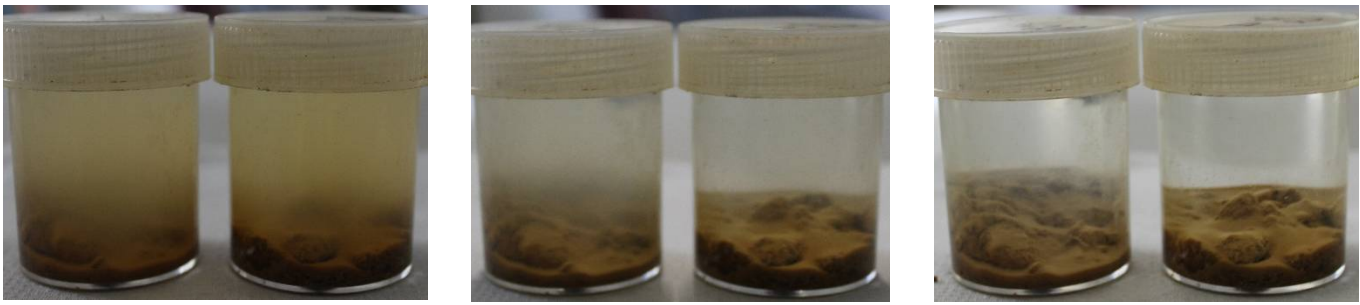
**Figure 4.8 (L) Soil profile for test pit 2. (R) Depth to 1500 mm, hard digging.**



**Figure 4.9 (L) Excavated soil. (R) Permeability determination (steady rate).**

**Comments on TP 2 soil**

Dark sandy topsoil and visible organic matter was found in first 150 mm. Below this was gravelly loamy clay until a depth of 1.5 m was achieved and hard digging prevented further excavation. Soil was moist and water seepage occurred at the bottom of the pit.



**Figure 4.10 Dispersion and gypsum responsiveness TP2.** In each photo the RHS jar is soil in gypsum solution. LHS jar is soil in water. (L set) after 15 minutes, (C set) after 2 hours. (R set) after 20 hours.

### Comments on dispersion of TP2 soil

Some dispersion is evident in jars, with slight difference between water and gypsum solutions. There was gypsum responsiveness, but the difference is not significant after 20 hours. It is probably unnecessary to add gypsum under the irrigation system. CSBP result = 0 (stable soil).

### Soil category by Ribbon test

**Table 4.4 Results of ribbon test. TP2.**

Site test 2	Generic sample
Ribbon length (mm)	25
Feel of sample	Firm, gritty
Soil category	3 loam

### Soil category by Permeability

Use of permeameter to measure water movement into the soil as per ASNZS 1547:2012.

Depth of auger hole = 50 cm      Depth of water in auger hole = 40 cm

Average radius of auger hole = 4.5 cm.      Depth to any impermeable layer (if known) > 2000 mm

Soil was  wet  moist or  dry at time of investigation.

**Table 4.5 Results of permeability studies TP2.**

Time (mins)	Level in tube (mm reading)	Drop in level (mm)
Start 0	780	
1	840	60
2	880	40
3	915	35
4	950	35
	Average	42.5 mm/min
$K_{sat}$ (from AS1547)	0.3 m/day	

Soil category from permeability readings: 4 (weakly structured clay loam).

# Ksat VALUES

Instrument Data			
Reservoir internal Diameter (mm)	==>	45	
Breather pipe Outer Diameter (mm)	==>	0	
Test Hole radius (mm)	==>	45	
Water Depth in Test Hole (mm)	==>	400	

Test Results				
Water Fall Rate (mm)/min	Flow Rate cm <sup>3</sup> /min	Ksat cm/min	Ksat m/day	
42.5	4.25	67.59	0.0207	0.30
43.5	4.35	69.18	0.0212	0.30
44.5	4.45	70.77	0.0216	0.31
45.5	4.55	72.36	0.0221	0.32
46.5	4.65	73.96	0.0226	0.33
47.5	4.75	75.55	0.0231	0.33
48.5	4.85	77.14	0.0236	0.34
49.5	4.95	78.73	0.0241	0.35
50.5	5.05	80.32	0.0246	0.35
51.5	5.15	81.91	0.0250	0.36



Figure 4.11 (L) Ksat determination TP2. (R) Water seepage at 1.5 m.

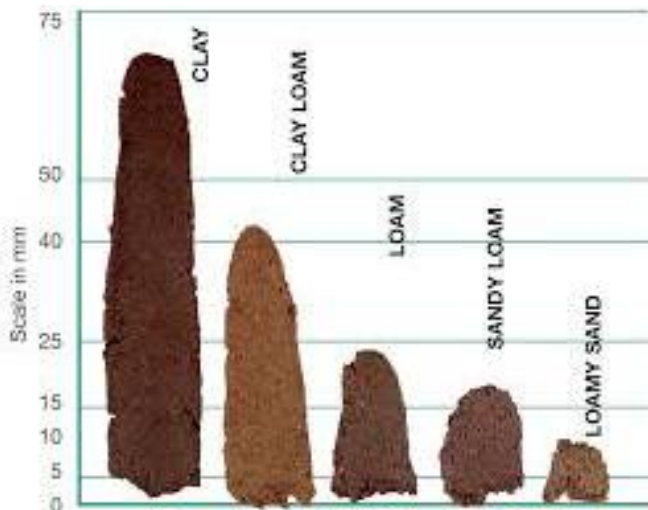





Figure 4.12 Photograph of ribbon test TP2.



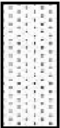
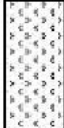


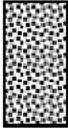
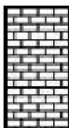

Figure 4.13 Soil fractions of sample TP2.

### Comment on soil fractions

Soil is sandy loam. Main fraction is sand with smaller amounts of silt and clay. Some gravel rocks are present (fragments over 2 mm diameter).

		<b>Soil Profile Borehole Log</b>		Date: Nov 17, 2021	Test Pit number. TP2
Client, Address: Parsons Management Group. Lot 128 South Western Highway, Byford					
Excavation type: Mini-excavator, hand auger			Groundwater Depth: 1.5 m		
Depth (metres)	Ease of excavation	Graphic Log	Material description and field notes	Moisture	
			<b>Soil Group Name:</b> colour, grain size, other descriptors: Guildford clay <b>Rock Description:</b> type, hardness, structure. Clayey loam		
0.5	VE		Dark grey-brown sandy topsoil	D	
				M	
1	E		Iron-stained clayey loam		
				M	
	H				
				M	
1.5	VH		End of excavation - hard digging, water seepage	W	
2					

### Key

						
Topsoil	Sandy loam	Clayey loam	Clay	Laterite	Parent rock	Gravelly soil

#### Ease of excavation

VE very easy E easy F firm H hard VH very hard

#### Moisture

D = dry M = moist W = wet (saturated)

**Figure 4.14 Soil profile log TP2.**

**Table 4.6 Soil Assessment – TP2**

Note: these comments are a review of the whole soil fraction. This is both a summary and comments of the laboratory testing, as shown in Table 3.2.

Feature	Assessment	Level of Constraint	Mitigation Measures
<b>Cation Exchange Capacity (CEC)</b>	Main cations have low concentration (except iron which is proportionally higher), although the calcium/magnesium ratio of about 1:3 is what is not ideal for optimal plant growth (too much magnesium).	Low	Soil amelioration unnecessary as nutrients in wastewater may be sufficient.
<b>Electrical Conductivity (TDS)</b>	Result of about 109 mg/L (0.171 dS/m) which is non-saline.	Low	No need to monitor salinity
<b>Emerson Aggregate Class</b>	Jar test suggests some slight dispersion. CSBP test result = 0 which suggests stable soil.	Low	NN*
<b>pH</b>	5.6 (6.2 – water solution) which is slightly acidic. Soil conditions will probably affect plant growth.	Low	Addition of alkaline wastewater may restore the soil to its optimum pH level.
<b>Sodium Absorption Ratio (SAR)</b>	Sodium concentration is lower than Magnesium and Calcium concentrations in the tested sample; SAR is very low (1.31) and not expected to pose a constraint. SAR is usually only a problem for dispersion and permeability if value >5.	Low	NN
<b>Sodicity (ESP)</b>	Sodium concentration is fair - 166 ppm. Exchangeable Sodium Percentage (ESP) 10.31% (non-sodic <6%).	Medium	Na proportionally high compared to other cations, but long-term sodicity monitoring is unnecessary.
<b>Rock Fragments</b>	Small rocks throughout profile. See Figure 4.9 while 4.13 shows screen fractions.	Low	NN
<b>Soil Depth</b>	Topsoil <150 mm	Low	NN
	Subsoil >150 mm. Clayey loam to 1.5 m when excavation stopped (but no refusal)	Medium	Any shallow dispersal method is suitable
<b>Soil Permeability &amp; Design Loading Rates</b>	$K_{sat} = 0.3$ m/day. Category 4. 3.5 mm/day DIR for irrigation system or 10 mm/day DLR for beds (20 mm/d for STS) [AS/NZS1547].	Medium	Any shallow dispersal method (flatbeds, dripline) is suitable.
<b>Soil Texture &amp; Structure</b>	Topsoil (<150 mm): Sand (Category 1).	Low	NN
	Subsoil (>150 mm): Clayey loam (Category 4), in accordance with AS/NZS1547:2012. Texture = 2.5 – loam, clayey loam. Gravel 20-25% (CSBP)	Medium	Any shallow dispersal method is suitable.
<b>Phosphorus Retention Index</b>	>1000 = very high PRI. This soil will remove much phosphate from effluent.	Low	Nutrient retention system will not be required.
<b>Watertable Depth</b>	Groundwater encountered, pit terminated at 1.5m.	Medium	Shallow irrigation possible.

\*NN: not needed

## 5. Discussion

Soils over whole site are fill– from sand to clayey loams. The amount of fill seems to be at least one metre deep. Even so, there would be no restriction for any type of secondary treatment system, but leach drains and septics cannot be installed as the site is within a Sewage sensitive area.

In the designated irrigation areas, dripline effluent would be permissible, and flatbed drains will be possible depending on the local sitting of system, which is determined upon excavation.



**Figure 5.1 Piles of fill, typically used on site.**

Figure 5.1 shows examples of the types of fill that were used. The issue is that fill is not consistent, sometimes Bassendean sand or similar, but also clayey loam and gravely clayey loam. However, since dripline or flatbed drains are proposed then these should not pose any constraints.

### Anticipated daily volumes

Anticipated daily volumes is shown in the table below. This data was provided by Parsons Management Group and Aquarius Wastewater, with hydraulic loadings taken from Supplement to Regulation 29 and Schedule 9.

**Table 5.1 Anticipated daily volumes.**

Premises	User Type	Number	L/p per day	Total
Storage Facility	Office Staff	3	30	90
	Customers	10	10	100
Factory Units	Office Staff (non-showering)	12	30	360
	Factory	12	70	840
	Visitors	24	10	240
Future Development Office and Warehouse	Office Staff (non-showering)	15	30	450
	Office Staff (showering)	3	70	210
	Warehouse Staff	18	70	1,260
	Visitors	10	10	100
<b>Daily total from all sources</b>				<b>3,650 L</b>

Considering the whole site, calculations of loading rates based on soil assessments are as follows:

### **Hydraulic/Design Loading Rate**

From AS/NZS 1547:2012, Tables L1 and M1, Soil Category 3.

**DLR** Trenches and beds (Table L1) 50 mm/d for Secondary Treatment Systems. **DIR** Drip or spray irrigation (Table M1) = 4 mm.

### **Land Application Area (LAA) Calculations**

The following outlines options for the wastewater irrigation systems. These are provided as examples of appropriate system sizing.

Anticipated daily volume = 3.650 L

Based on the results of the site and soil assessment, Health Regulation 49 that describes the surface area of drains and the calculations listed above, the overall land capability of the proposed onsite sewage system is as follows:

#### *ATU or STS*

Dripline irrigation  $3650 \div 4 = 913 \text{ m}^2$ .

Leach drains  $3650 \div (1.5 \times 50) = 49 \text{ m}$ . Assume DLR = 50, SA drains  $1.5 \text{ m}^2$ . Proposal 4 drains of 13 m length.

Flatbeds  $3650 \div (2.4 \times 50) = 30.42 \text{ m}$ . Proposal 4 bed x 8 m long drain – as alternating drains of 2 pairs of drains. It is possible to have two alternating drains each 15.5 m long, but space restrictions may prevent this.

As conventional leach drains require greater depth of burial and have a smaller surface area, the space restriction (width-wise) may be a limiting factor. Furthermore, there may not be enough vertical separation from the water table. Flatbed drains are a better proposition as while wider they are shorter and will fit in the allocated space. There doesn't appear to be enough landscaping area for dripline due to the mount of infrastructure proposed.

### **Secondary Treatment System (STS) Recommendations**

A 4 kL system is recommended to allow for any shock loads or other issues that occasionally arise. As the site is within the Swan River catchment then there is a need for a nutrient retentive system, especially since the PRI is low in the fill but is very high in natural ground. Flatbed drains do not require disinfection as this is subsoil, but may be appropriate for this site.

Drains will require a diversion valve which can be changed at every service (3 months) by the service technician. Alternatively, a KRain or similar hydraulic valve, which automatically shifts water to a different bed each time the pump is employed, can be installed.

### **Final statement**

There is probably not enough land application area space available for dripline irrigation.

Permeability is fair and, in this case, two or four alternating flatbeds fit in the available space.

For a secondary treatment system, irrigation area should be laid out in zones. Effluent is typically pumped so, using a KRain or similar device, two alternating zones are possible.

An indicative area for wastewater effluent dispersal is shown in Figure 5.2. However, setbacks from boundaries and buildings need to be followed as per Council requirements.



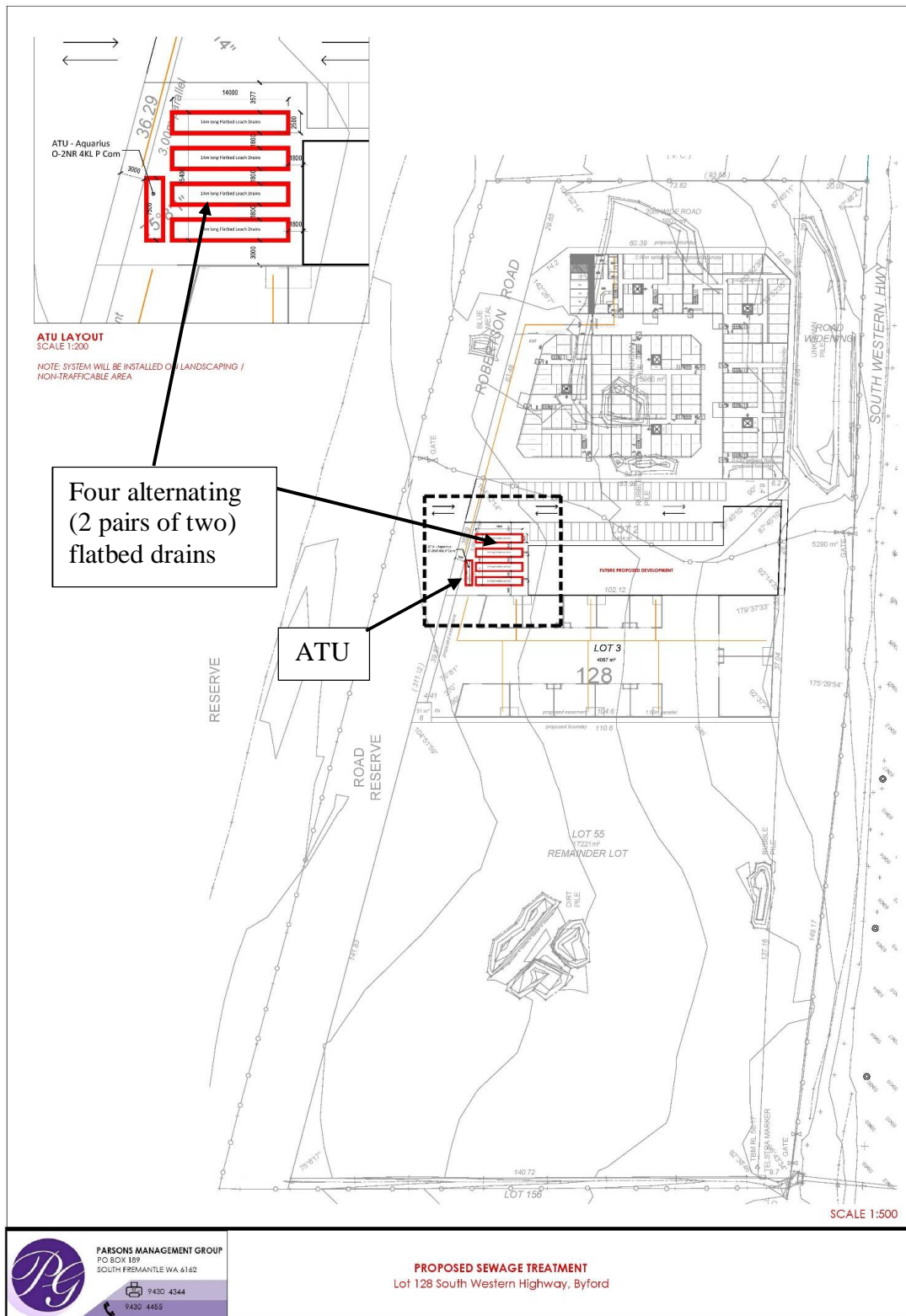


Figure 5.2 Indicative area for wastewater treatment system.

## 6. References

- Davidson, W. (1995). Hydrogeology and groundwater resources of the Perth region. Geological Survey of Western Australia, Department of Minerals and Energy.
- Earth Colors - a guide for soil and earthtone colors. (1996). Globe Program. Chicago, USA.
- Schoknecht, N and Pathan, S (2013). Soil groups of Western Australia: a simple guide to the main soils of Western Australia (4th edition). Department of Agriculture and Food. Perth. Report 380.

## 7. Information on Secondary Treatment Systems (STS)

This is a generic description of considerations for a STS for homeowners. Further information about the operation and maintenance of these systems can be found from manufacturers and suppliers.

### 1. Consequences of overloading system.

Every Secondary Treatment System (STS) or septic or wastewater treatment system gradually accumulates sludge and scum. This is because the scum that floats on the surface is mainly oils, grease and fats, and these substances are not readily broken down by the bacteria. Sludge builds up on the bottom as this is foodstuffs and materials that aren't broken down, as well as a build-up of dead bacteria. Literally millions of bacteria die every day and this accumulates as sludge. Should the system experience overloading from too many people using and contributing to the wastewater stream then there is simply not enough retention time for the microbes and processes that occur to satisfactorily break down the solids, so more sludge and scum occur and untreated sewage passes from one chamber to another, and may eventually be pumped out to irrigation.

In this scenario, eventually, your system will require a pump out – typically anywhere from two to five years.

### 2. Consequences of under-loading the system.

A Secondary Treatment System relies on a balance between food (household wastewater) and microbes. If not enough wastewater enters the treatment plant (due to homeowners away on holiday, few people staying in home) then microbes run out of food and die – more sludge accumulates. However, the most important effect is that should a large volume of wastewater suddenly enter the system then there isn't enough microbes to break this down and so untreated sewage passes through the system.

### 3. Requirements for servicing and maintenance (by authorised Service Technician).

Service Personnel need clear access to your system so that they can carry the required testing and cleaning equipment from their vehicle to the tank/s, and so that they can easily remove hatches and undertake the range of tasks performed at each service. Please:

- Do not cover tanks and hatches with soil, cement, paving or any material.
- Do not prevent quick and easy access to any inspection openings.
- Do not allow roof or surface water to enter any part of the system.
- Allow free access to your property for the service person. Ensure that the gates are unlocked, your dogs are locked up and your children are supervised.
- Keep plants and grass monitored and maintained on land application areas (irrigation zone/s).

### 4. Homeowners responsibilities

Here are some suggestions that will help to ensure the optimum operation of your wastewater treatment system.

#### **Washing Machines**

Try to evenly spread your washing over a period of a week. Avoid where possible to wash everything in one day. It puts too much water and alkaline substances in the system in a short time and your treatment plant will struggle to cope. Liquid soaps breakdown easier than powder types, and they generally contain less salt and are at a lower pH – both of which will affect soils and plant growth. Try not to use too much soap of any type.

#### **Things to Avoid**

Chlorine, disinfectant, ammonia, acids, bleaches, caustics and heavy chemical products, nappy pre-soaker products, antibacterial products, fat, oil, grease, milk, toilet deodorizers and cleaners

etc are some of the types of products that will cause the bacteria to die off in your STS. It will recover but may cause some odours in the short term.

**Don't** allow foreign objects, (eg. Nappy liners, disposable nappies, tampons, pads, condoms etc) to enter the system. They do not breakdown and can cause problems.

**Avoid** pouring large quantities (½ litre or more) of beer, flour, yeast, wine, milk, fruit juice or oils into the system. Products that are acidic may affect bacteria production. (Milk, beer and fruit juices, for example, often contain large amounts of sugar which is digested by some bacteria that rob the water of oxygen, and this, in turn, stops the growth and working of those bacteria that rely of oxygen to survive).

#### 5. Types of products and materials that should not enter the STS plant.

You must try to use environmentally-friendly cleaning products as any product used that kills bacteria is harmful to your system. If you wish to use some of the harsher cleaning products, such as bleach, nappy cleaning products and any disinfectants, it is suggested that you use a bucket and discard the contents in a hole in a disused area of the garden.

Some other things that may cause problems are antibiotics or people who are on chemotherapy. Antibiotics are designed to kill bacteria in your body and they also wipe out these good bacteria working hard in the STS. We do not suggest that you stop your medication, just expect that the treatment system may not function well for a short time.

It is fair to suggest that all products should be used in moderation.

**Surface cleaners** - when using surface cleaners try to wipe excess cleaner with a disposable cloth and discard contents into the bin.

**Toilet cleaners** - cream cleaner or washing soda (Sodium carbonate).

**General cleaners** – bicarb soda (Sodium hydrogen carbonate), vinegar (not too much).

**Floor cleaners** - use hot water and detergent.

**Laundry powders and liquids** - use suitable products that contain low phosphorus and low salt (used as bulking/fill agents).

#### **Do Not Allow These to Enter Your STS (not down the drain)**

- oil, paint and chemicals
- drain cleaning or clearing products
- methylated spirits, kerosene, acetone or any other solvents
- flea or tick wash
- oven cleaners
- plastics of any type
- disposable nappies, sanitary napkins

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