

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Proposed Lot 2 Neerabup Road

Suburb: Clarkson

State: WA

P/code: 6030

Local government area: City of Wanneroo

Description of the planning proposal: Proposed commercial development (DA)

BMP Plan / Reference Number: 65672 R01

Version: Rev 0

Date of Issue: 08/11/2023

Client / Business Name: Clarkson Central Pty Ltd

Reason for referral to DFES	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 BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
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 checked="" type="checkbox"/>	<input type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Development includes a proposed service station (high-risk land use).

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name Louisa Robertson	Accreditation Level Level 3	Accreditation No. BPAD 36748	Accreditation Expiry 28/02/2024
Company JBS&G		Contact No. 08 9792 4797	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner



Date 08/11/2023



Proposed commercial development, Proposed Lot 2 Neerabup Road, Clarkson

Clarkson Central Pty Ltd

Bushfire Management Plan (Development Application)

JBS&G 65672 | 155,246

8 November 2023





We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte



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1. Proposal details

1.1 Background

Clarkson Central Pty Ltd is lodging a development application in relation to a proposed commercial development within proposed Lot 2 (currently Lot 408 Neerabup Road), Clarkson (the project area), located in the City of Wanneroo. The site plan (**Figure 1**; Hodge Collard Preston Architects 2023) identifies that the proposed development will comprise the following elements:

- convenience store (200 m²)
- fast food outlet (220 m²) and alfresco (20 m²)
- fuel canopy – including three pumps and six bays
- parking bays
- landscaping
- one crossover to Key Largo Drive
- vehicular access connection to the Woolworths internal access road, with a public access easement applied.

1.2 Site description

The project area comprises approximately 0.41 ha within the eastern portion of existing Lot 408 Neerabup Road. A subdivision application has been lodged in relation to subdivision of Lot 408 as follows:

- Lot 1, which incorporates the adjoining Woolworths supermarket and associated parking bays and internal roads,
- Lot 2, which incorporates the project area and proposed development.

The Deposited Plan for the proposed subdivision is included in Appendix A.

As show in in **Figure 2**, the project is located at the corner of Neerabup Road and Key Largo Drive. Clarkson Nature Reserve (R52272) is located directly south of Neerabup Road within Lots 8001 and 8002 and contains bushfire prone vegetation (see Section 1.3). The remainder of land surrounding the project area comprises existing commercial and residential development.

1.3 Bushfire prone designation

The southern portion of the project area is designated as bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2021; see **Plate 1**) due to being within 100 m of identified bushfire prone vegetation within Reserve 52272, to the south of Neerabup Road.

As depicted in **Figure 3** (Section 3.2), the proposed convenience store and fuel canopy are located within a designated bushfire prone area, however the proposed fast food outlet building is not.

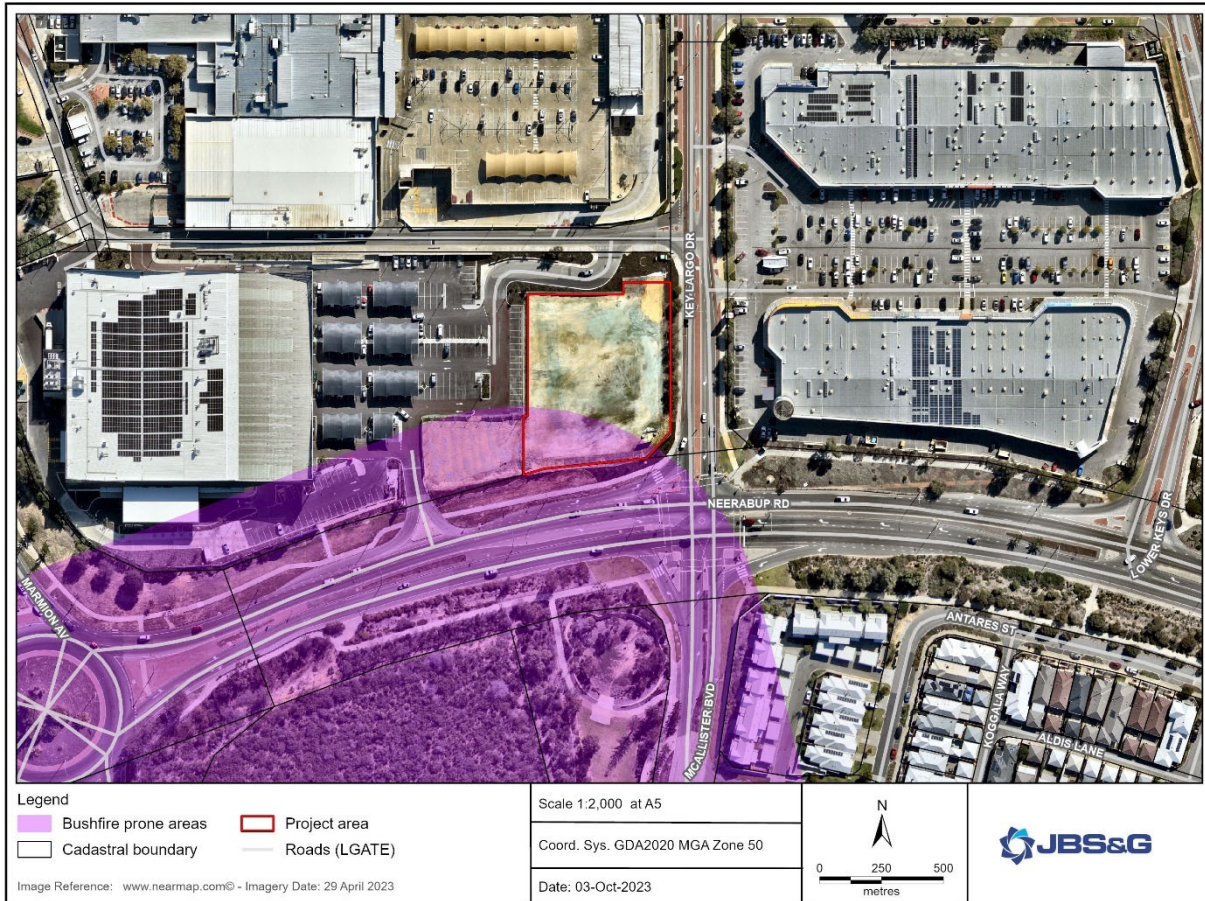


Plate 1: Map of Bush Fire Prone Areas (DFES 2021)

1.4 Proposed development

1.4.1 Development description

The proposed development is for a commercial complex comprising a convenience store, fuel bowsers, overhead canopies, vehicle parking bays and a fast-food outlet.

1.4.2 Habitable development

Habitable development within the proposed development will comprise the convenience store and fast food outlet and attached alfresco (refer to **Figure 1**). The remaining development will consist of non-habitable structures such as the fuel canopies and outdoor elements such as the parking bays and landscaping.

1.4.3 Site occupancy

The service station will operate on a 24-hour basis, with staffing numbers varying over this time period from 1 to 3 people. Maximum site occupancy during peak periods is anticipated to be approximately 30 – 40 people, and much lower overnight. The service station is expected to be frequented by a steady

stream of vehicles (mainly cars and other light vehicles) during the day and evening to its location within the Clarkson Central commercial precinct.

The fast-food outlet will operate from 5 am to 10 pm most days, however, may have potential to operate on a 24 period as a drive-through between the hours of 10 pm and 5 am. Maximum occupancy is up to 40 people in the building during peak periods and up to 15 cars in the drive through.

1.4.4 High risk land uses

High-risk land uses are defined in *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) as –

“A land use which may lead to the potential ignition, prolonged duration and/or increased intensity of a bushfire. Such uses may also expose the community, fire fighters and the surrounding environment to dangerous, uncontrolled substances during a bushfire event.”

Further advice is provided in *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2021) that service stations are considered high-risk land uses.

Additional reporting requirements resulting from this designation are discussed in Section 1.5.

1.5 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measures 6.2 and 6.5 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas Version 1.4* (the Guidelines; WAPC 2021)

As discussed previously, the proposed development is considered a high-risk land use which triggers additional requirements under SPP 3.7, namely Policy Measure 6.6. This BMP has been prepared in accordance with Sections 5.4 and 5.6 of the Guidelines, which require development applications for high-risk land uses in a bushfire prone area to be accompanied by a BMP that includes the results of a BAL contour map assessment and a Bushfire Risk Management Plan (BRMP). The BRMP has been prepared separately (JBS&G 2023) and is to be read in conjunction with this BMP.

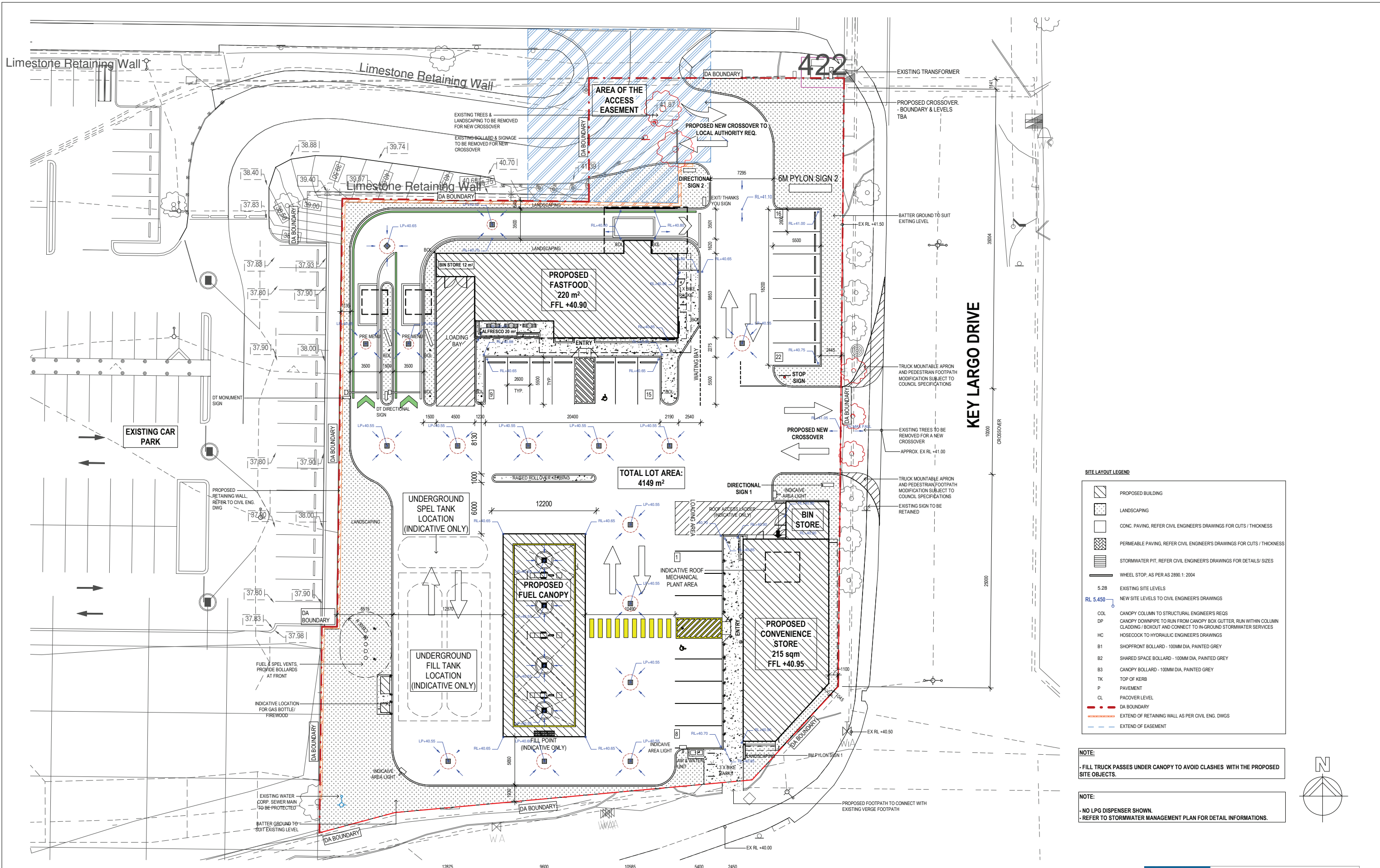
1.6 Other plans/reports

JBS&G has previously prepared the following BMPs for the project area, at various planning stages:

1. BMP prepared for Urbis to support the Structure Plan application for Lot 408 Neerabup Road (Strategen 2018)
2. BMP addendum prepared for Woolworths Group to support the Development Application for a Woolworths store within the western portion of Lot 408 Neerabup Road (Strategen-JBS&G 2021)
3. BMP addendum prepared for Fabcot Pty Ltd to support subdivision of Lot 408 into two lots. Lot 1 containing the Woolworths site, and Lot 2 containing the current project area.

While this BMP has been prepared as a standalone document, it is recommended that the BMPs listed as items 1. and 3. above, are also referred to by the decision-making authority.

As discussed previously, JBS&G has prepared a BRMP (2023) as a requirement of Policy Measure 6.6 of SPP 3.7 which should be read in conjunction within this BMP.

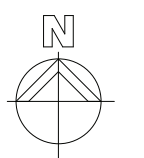


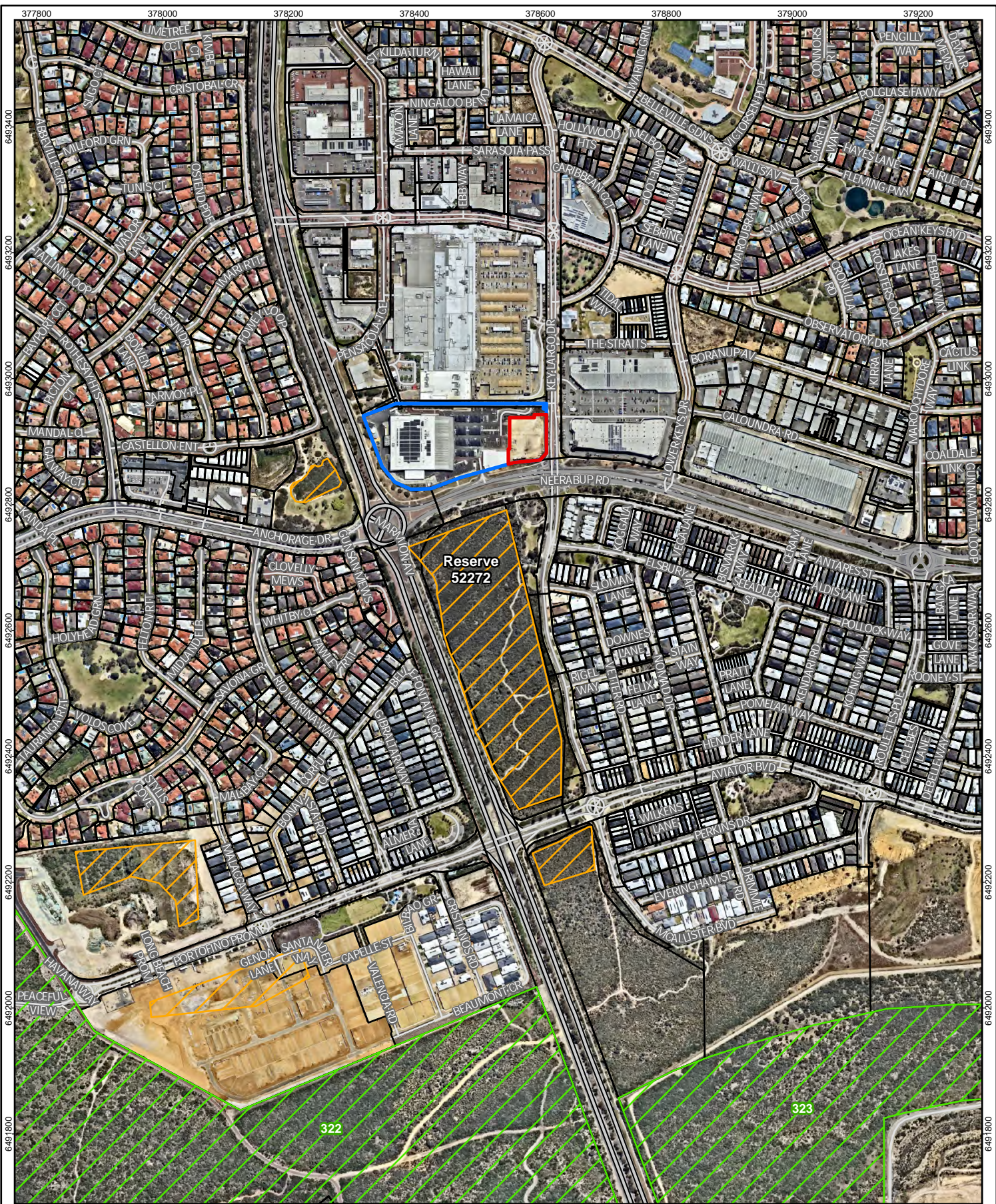
SITE LAYOUT LEGEND

[Symbol]	PROPOSED BUILDING
[Symbol]	LANDSCAPING
[Symbol]	CONC. PAVING, REFER CIVIL ENGINEER'S DRAWINGS FOR CUTS / THICKNESS
[Symbol]	PERMEABLE PAVING, REFER CIVIL ENGINEER'S DRAWINGS FOR CUTS / THICKNESS
[Symbol]	STORMWATER PIT, REFER CIVIL ENGINEER'S DRAWINGS FOR DETAILS/ SIZES
[Symbol]	WHEEL STOP, AS PER AS 2890.1: 2004
5.28	EXISTING SITE LEVELS
RL 5.450	NEW SITE LEVELS TO CIVIL ENGINEER'S DRAWINGS
COL	CANOPY COLUMN TO STRUCTURAL ENGINEER'S REQS
DP	CANOPY DOWNSPIPE TO RUN FROM CANOPY BOX GUTTER, RUN WITH COLUMN CLADDING / BOXOUT AND CONNECT TO IN-GROUND STORMWATER SERVICES
HC	HOSECOCK TO HYDRAULIC ENGINEER'S DRAWINGS
B1	SHOPFRONT BOLLARD - 100MM DIA, PAINTED GREY
B2	SHARED SPACE BOLLARD - 100MM DIA, PAINTED GREY
B3	CANOPY BOLLARD - 100MM DIA, PAINTED GREY
TK	TOP OF KERB
P	PAVEMENT
CL	PACOVER LEVEL
[Symbol]	DA BOUNDARY
[Symbol]	EXTEND OF RETAINING WALL AS PER CIVIL ENG. DWGS
[Symbol]	EXTEND OF EASEMENT

NOTE:
 - FILL TRUCK PASSES UNDER CANOPY TO AVOID CLASHES WITH THE PROPOSED SITE OBJECTS.

NOTE:
 - NO LPG DISPENSER SHOWN.
 - REFER TO STORMWATER MANAGEMENT PLAN FOR DETAIL INFORMATIONS.





Legend	== Highway
Project area	== Major road
Subject Lot 408	== Minor road
Cadastral boundary	
Bush Forever site (DPLH)	
Banksia Woodland TEC	

Scale: 1:8,000 at A4	
Coord. Sys. GDA2020 MGA Zone 50	
Job Number: 65672	
Client: Clarkson Central Pty Ltd	
Version: A	Date: 26-Oct-2023
Drawn By: jcrute	Checked By: ZC

Proposed Mixed Commercial site, Lot 408 Neerabup Road, Clarkson, WA

SITE OVERVIEW

FIGURE 2

2. Environmental considerations

2.1 Environmental values

The project area is fully cleared and has been subject to previous development and is not known to contain any environmental values. The only consideration of note is retained bushland within Catalina Nature Reserve (R52272), located directly south of Neerabup Road. The proposed development is not known to have any environmental impacts on this vegetation.

Any environmental impacts resulting from implementation of the proposal will be addressed by the proponent under standard State and Federal environmental assessment and referral requirements under the *Environmental Protection Act 1986* and *Environment Protection and Biodiversity Conservation Act 1999* as required.

2.2 Native vegetation - modification and clearing

The project area is fully cleared. On this basis the development does not propose the removal of any native vegetation.

2.3 Revegetation / landscape plans

No revegetation works are proposed as part of the development.

Areas of proposed landscaping will consist of non-vegetated elements and low threat managed gardens of natives and low ground covers, as depicted on the Landscape Plan (refer to Appendix B). Proposed landscaping is consistent with low threat requirements of *AS 3959—2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) Clause 2.2.3.2 (e) and (f) and Schedule 1 of the Guidelines (refer to Appendix C).

3. Bushfire assessment results

3.1 Bushfire attack level contour assessment

A Bushfire Attack Level (BAL) contour assessment has been undertaken in accordance with Method 1 of AS 3959 for the project area. The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation classification
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts and/or deliver compliance with the bushfire protection criteria of the Guidelines.

The BAL contours are based on:

- classification and effective slope of post-development vegetation, as observed at the time of inspection
- consideration of vegetation exclusions within and surrounding the project area
- consideration of proposed on-site low threat landscaping works
- separation distances between proposed habitable development and classified vegetation achieved in line with the site plan.

3.2 Assessment inputs

3.2.1 Vegetation classification

Classified vegetation and exclusions were assessed within the project area and adjoining 150 m (the assessment area) through on-ground verification on 29 September 2023 in accordance with AS 3959 and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016).

Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix D.

Vegetation conditions are summarised as follows and depicted in **Figure 3**:

- the project area contains no classifiable vegetation and currently comprises cleared land/built form (a low threat state is expected to be maintained within the project area throughout the life of the development)
- vegetation within the bushland reserve land opposite Neerabup Road to the south consists of Class D Scrub (Plot 1)
- the narrow strip of vegetation along Neerabup Road to the southeast which is less than 20 m in width and not within 20 m of other classified vegetation or the project area is excluded under Clause 2.2.3.2 (d) (Plot 2)
- existing non vegetated areas (e.g. roads and buildings) and low threat managed land (e.g. urban road verge treatments, managed POS etc) are excluded under Clauses 2.2.3.2 (e) and (f) (Plot 3).

3.2.2 Effective slope

JBS&G assessed effective slope under classified vegetation within the assessment area as part of the original Structure Plan BMP (Strategen 2018) and DA BMP (Strategen-JBS&G 2021) in accordance with AS 3959. Results were cross referenced with DPIRD 2m contour data and are depicted in **Figure 3**.

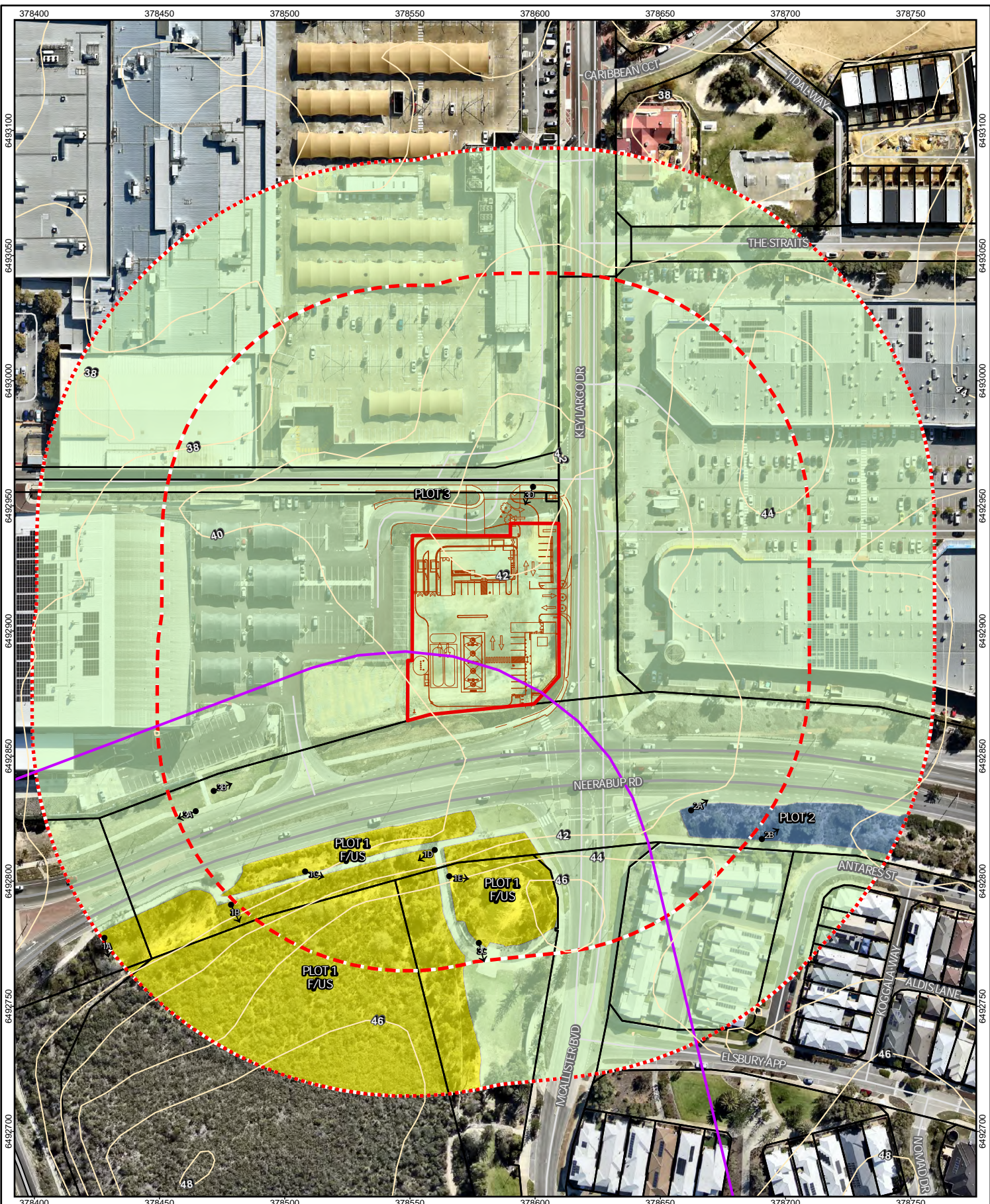
Site observations indicate that the effective slope under all classifiable vegetation within the 150 m assessment area is predominantly flat or upslope.

3.2.3 Summary of inputs

Figure 3 illustrates the anticipated post-development vegetation classifications and exclusions following completion of construction works and implementation of low threat landscaping throughout the project area and adjacent 150 m. The post-development vegetation classifications/exclusions and effective slope are summarised in **Table 1**.

Table 1: Summary of post-development vegetation classifications, exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope
1	Class D Scrub	Flat/upslope (0°)
2	Excluded – Clause 2.2.3.2 [d]	Flat/upslope (0°)
3	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A



Legend	
	Project area
	100m assessment area
	150m assessment area
	Cadastral boundary
	Bushfire prone areas
	Proposed development layout
	Topographic contours (mAHd)
	Class D Scrub
	Clause 2.2.3.2 (d)
	Clause 2.2.3.2 (e) & (f)
	Photo point directions
	Highway
	Major road
	Minor road

Scale: 1:2,000 at A4	
Coord. Sys. GDA2020 MGA Zone 50	
Job Number: 65672	
Client: Clarkson Central Pty Ltd	
Version: A	Date: 08-Nov-2023
Drawn By: jcrute	Checked By: ZC

Proposed Mixed Commercial site, Lot 408 Neerabup Road, Clarkson, WA

VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE

FIGURE 3

3.3 Assessment outputs

3.3.1 BAL contour assessment results

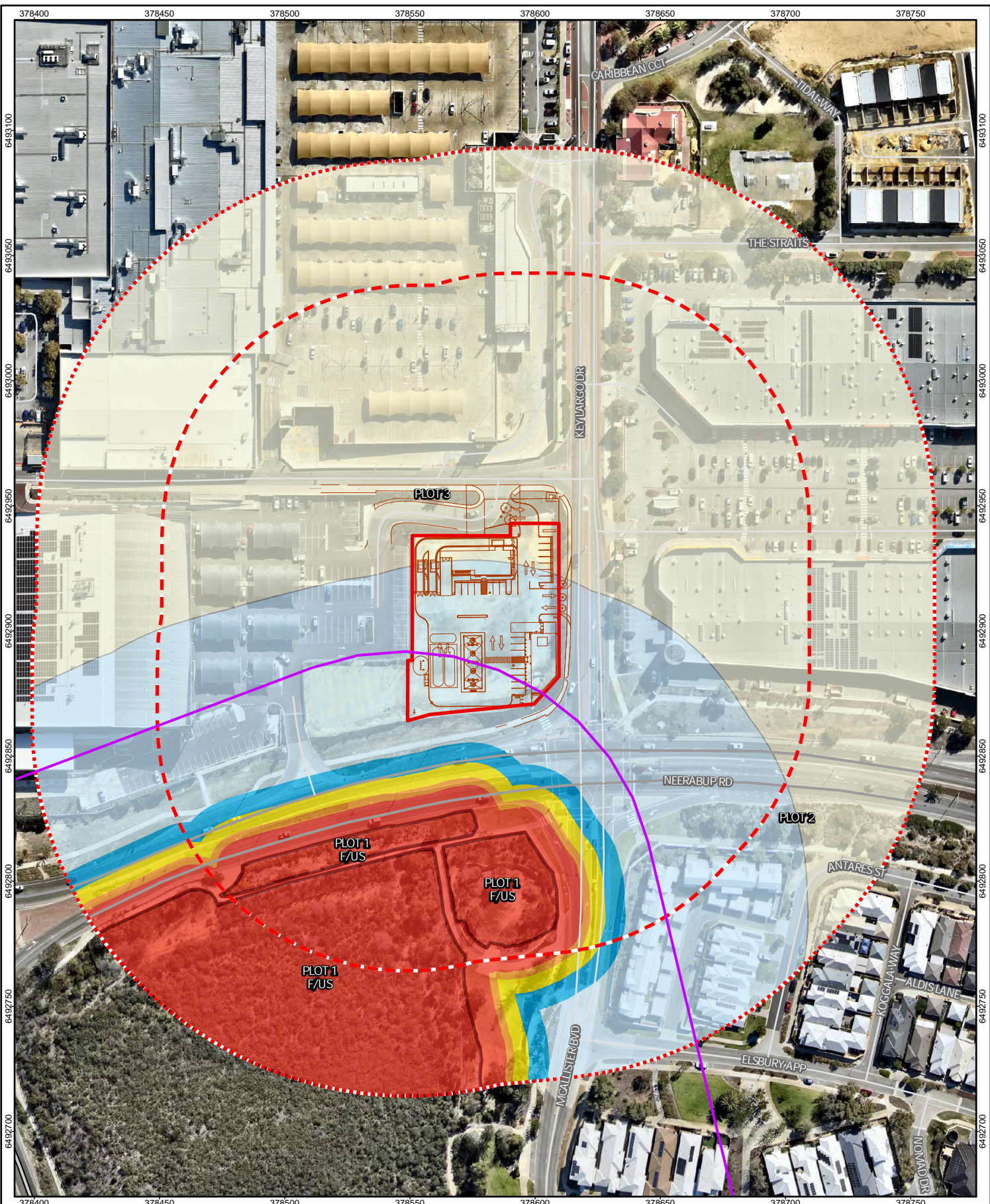
The results of the BAL contour assessment are detailed in Table 2 and illustrated in **Figure 4**.

The results demonstrate that the proposed habitable buildings will be located in BAL-12.5. This satisfies acceptable solution A1.1 of Element 1, which requires all habitable development to be located in BAL-29 or below.

The BAL contour assessment also demonstrates that the fuel canopies and bowers will be located in BAL-12.5 which will limit the potential for ignition of the high-risk elements of the proposed development during a bushfire event.

Table 2: BAL contour assessment results

Building element	Bushfire prone area	Plot	Vegetation classification	Effective Slope	Separation distance	BAL
Habitable buildings						
Convenience store	Yes	Plot 1	Class D Scrub	Flat/upslope (0°)	55 m	BAL-12.5
Fast food outlet	No	Plot 1	Class D Scrub	Flat/upslope (0°)	93 m	BAL-12.5
Non-habitable elements						
Fuel canopy and bowers	Yes	Plot 1	Class D Scrub	Flat/upslope (0°)	47 m	BAL-12.5



Legend	
	Project area
	100m assessment area
	150m assessment area
	Bushfire prone areas
	Classified vegetation
	Proposed development layout
	Highway
	Major road
	Minor road
	BAL contours
	BAL FZ
	BAL 40
	BAL 29
	BAL 19
	BAL 12.5
	BAL Low

Scale: 1:2,000 at A4	
Coord. Sys. GDA2020 MGA Zone 50	
Job Number: 65672	
Client: Clarkson Central Pty Ltd	
Version: A	Date: 08-Nov-2023
Drawn By: jcrute	Checked By: ZC

Proposed Mixed Commercial site, Lot 408 Neerabup Road, Clarkson, WA

BAL CONTOUR MAP

FIGURE 4

4. Identification of bushfire hazard issues

4.1 Bushfire context

Landscape scale bushfire considerations deal with long fire runs adjacent to development comprising large areas of continuous and dense fuel loads that often occur on steep or inaccessible terrain and make early fire suppression difficult. Bushfire risk to the project area is limited to fire runs through scrub vegetation within Catalina Nature Reserve to the south which does not constitute landscape scale fire risk.

Under predominant afternoon summer weather conditions for the location, the likely prevailing winds are from the east and southwest in the morning and southwest in the afternoon. Summer winds from the north are less common and can occur during the bushfire season when a low-pressure trough forms off the west coast and strong winds develop from the north or northeast. However, there is no significant fire run from the north due to existing development at the northern interface of the project area.

A fire front approaching the project area from the southwest, south or southeast are considered to be the worst-case bushfire scenarios due to the prevailing winds and presence of fire runs longer than 500 m through Catalina Nature Reserve and other areas of uncleared scrub land within the wider area.

The bushfire hazard located within Catalina Nature Reserve to the south will remain post development of the site, however Neerabup Road provides a significant buffer between the proposed development and bushfire hazards, which will limit potential radiant heat impacts to 12.5 kW/m² or lower (BAL-12.5 equivalent).

JBS&G considers the bushfire hazards adjacent to the project area and the associated bushfire risk is readily manageable through standard management responses outlined in the Guidelines and AS 3959. These responses have been factored in to proposed development early in the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life and property assets.

4.2 Bushfire hazard issues

Examination of the proposed development design, post development BAL contour assessment and local bushfire context has identified the following bushfire hazard issues for the proposed development:

1. The project area is located within a bushfire prone area and subject to a BAL above BAL-Low due to the on-site and surrounding bushfire prone vegetation hazards mentioned above and requires an assessment against the bushfire protection criteria of the Guidelines in accordance with Policy Measure 6.5 of SPP 3.7.
2. Separation is required to be provided between the proposed the habitable buildings and surrounding vegetation hazards suitable to achieve BAL-29 or lower.
3. The service station is required to be serviced by compliant vehicular access routes which provide suitable access within and around the development site as well as access/egress to two suitable destinations in two different directions. This will be provided by the existing and proposed public road network and on-site private roadways.
4. The proposed development will be provided with an on-site firefighting water supply by the existing on-street hydrant on Kay Largo Drive.
5. As the proposed service station constitutes a high-risk land use, a BRMP is to be prepared to address the operation of the site in relation to the bushfire risk associated with on-site combustible, flammable and hazardous substances in accordance with Policy Measure 6.6 of SPP 3.7 (refer to JBS&G 2023).

Bushfire mitigation measures designed to address the abovementioned bushfire hazard issues are described in Section 5 of this BMP.

5. Assessment against the bushfire protection criteria

5.1 Compliance with Elements 1 – 4

Compliance with Elements 1 – 4 of the bushfire protection criteria of the Guidelines (Version 1.4) is demonstrated by meeting the acceptable solutions, as detailed in Table 3.

Table 3: Compliance with the bushfire protection criteria of the Guidelines (Elements 1 – 4)

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
Element 1: Location	P1 – The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed. For unavoidable development in areas where BAL–40 or BAL–FZ applies, demonstrating that the risk can be managed to the satisfaction of the decision-maker.	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL–29 or below.	The BAL contour assessment (see Figure 4 indicates that all proposed development (including habitable buildings and fuel canopies) will be located areas subject to BAL-12.5.	✓
Element 2: Siting and design	P2 – The siting and design of the strategic planning proposal, subdivision or development application,	A2.1 Asset Protection Zone	The siting of habitable buildings and the proposed on-site low threat landscaping treatments will ensure that the habitable elements and the fuel canopy and bowsers will be located in an area subject to BAL-12.5. No formal	✓

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
	including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defensible space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.	Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the requirements set out in Schedule 1.	APZs will be required to achieve the intended rating of BAL-12.5, however, low threat areas of the project area are to be maintained in a low threat state as per AS 3959 Clauses 2.2.3.2 (e) & (f) and Schedule 2 of the Guidelines (Appendix C) on an ongoing basis to ensure this outcome is maintained in perpetuity. The car fuel canopy and bowsers will also be located in an area of BAL-12.5 to reduce radiant heat impacts on the flammable elements of the proposed development.	
Element 3: Vehicular access	P3i – The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public roads <i>The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.</i> Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	No public roads are proposed as part of the development application. The proposed development will be serviced by the existing public road network.	N/A
		A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).	The proposed development will be provided with access in multiple directions to multiple suitable destinations. Immediate access/egress from/to the project area will be via Key Largo Drive, which borders the eastern site boundary. Key Largo Drive provides for entry from the	✓

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
		<p>If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.</p> <p>The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:</p> <ul style="list-style-type: none"> the no-through road travels towards a suitable destination; and the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23. 	<p>south, and exit to the north, west and east via various roads in the public road network.</p> <p>A public access easement will also be applied over proposed Lot 1 (Woolworths lot) to enable public access onto the Woolworths internal access road, then out to the Clarkson Central private access road (which has an existing public access easement) in the north, or to Neerabup Road in the south.</p>	
		<p>A3.2b Emergency access way</p> <p><i>Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.</i></p> <p>An emergency access way is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements in Table 6, Column 2; provides a through connection to a public road; be no more than 500 metres in length; and must be signposted and if gated, gates must open the whole trafficable width and remain unlocked. 	<p>The proposed development design does not require emergency access ways to provide through access to a public road.</p>	N/A
		<p>A3.3 Through-roads</p>	<p>The project area is serviced by through roads.</p>	N/A

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
		<p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ul style="list-style-type: none"> it is demonstrated that no alternative road layout exists due to site constraints; and the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table. <p>A no-through road is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements of a public road (Table 6, Column 1); and turn-around area as shown in Figure 24. 		
	<p>P3ii – The design of vehicular access and egress provides:</p> <ul style="list-style-type: none"> access and egress for emergency service vehicles while allowing the community to evacuate; a defensible space for emergency services personnel on the interface between classified vegetation and development site; and hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s). 	<p>A3.4a Perimeter roads</p> <p>A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of:</p> <ul style="list-style-type: none"> separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and removing the need for battle-axe lots that back onto areas of classified vegetation. <p>A perimeter road is to meet the requirements contained in Table 6, Column 1.</p> <p>A perimeter road may not be required where:</p> <ul style="list-style-type: none"> the adjoining classified vegetation is Class G Grassland; lots are zoned for rural living or equivalent; it is demonstrated that it cannot be provided due to site constraints; or all lots have frontage to an existing public road. 	<p>Neerabup Road provides an existing compliant perimeter road at the interface between the proposed development and the vegetation hazards to the south of the project.</p>	✓

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
	<p>P3iii – Vehicular access is provided which allows:</p> <ul style="list-style-type: none"> access and egress for emergency service vehicles; defendable space for emergency services personnel on the interface between classified vegetation and development; and hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s). 	<p>A3.4b Fire service access route</p> <p><i>Where proposed lots adjoin classified vegetation under AS3959 (excluding Class G Grassland), and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.</i></p> <p>A fire service access route is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements in Table 6, Column 3; be through-routes with no dead-ends; linked to the internal road system at regular intervals, every 500 metres; must be signposted; no further than 500 metres from a public road; if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres. 	<p>The proposed development is provided with public perimeter roads and does not require fire service access routes.</p>	N/A
	<p>P3iv – Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies</p>	<p>A3.5 Battle-axe access legs</p> <p><i>Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.</i></p> <p>There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the</p>	<p>The project area is not serviced by a battle-axe.</p>	N/A

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
	and exit the lot without entrapment.	<p>lot, is less than 50 metres from a public road in a reticulated area.</p> <p>In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres). 		
		<p>A3.6 Private driveways</p> <p>There are no private driveway technical requirements where the private driveway is:</p> <ul style="list-style-type: none"> • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. <p>In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements:</p> <p>requirements in Table 6, Column 4;</p> <ul style="list-style-type: none"> • passing bays every 200 metres with a minimum length of 20 metres and a minimum • additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and 	The proposed internal road network has been designed to achieve requirements under A3.6 (refer to Appendix E).	✓

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
		<ul style="list-style-type: none"> turn-around area as shown in Figure 28 and within 30 metres of the habitable building. 		
Element 4: Water	No performance principle applies	<p>A4.1 Identification of future water supply</p> <p>Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2.</p> <p>Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.</p>	A4.1 is applicable to strategic planning applications only.	N/A
	<p>P4 – Provide a permanent water supply that is:</p> <ul style="list-style-type: none"> sufficient and available for firefighting purposes; constructed from non-combustible materials (e.g. steel), or able to maintain its integrity throughout a bushfire; and accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles. 	<p>A4.2 Provision of water for firefighting purposes</p> <p>Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:</p> <p>The provision of a water tank(s), in accordance with the requirements of Schedule 2; and</p> <p>Where the provision of a strategic water tank(s) is applicable, then the following requirements apply:</p> <ul style="list-style-type: none"> land to be ceded free of cost to the local government for the placement of the tank(s); the lot or road reserve where the tank is to be located is identified on the plan of subdivision; tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and 	The proposed development will be serviced by reticulated water supply from on-street hydrants adjacent to the project area on Key Largo Drive.	✓

Bushfire protection criteria	Performance Principle	Method of compliance	Statement of development compliance	Compliance achieved
		Acceptable solutions		
		<ul style="list-style-type: none"> a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). <p>Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.</p>		

5.2 Compliance with Element 5

Element 5 relates specifically to vulnerable tourism land uses and is therefore not applicable to the proposed development application.

5.3 Specific and additional management measures

JBS&G advises the following specific and additional bushfire management measures to increase the level of bushfire risk mitigation across the site as part of the current development application.

5.3.1 Building construction standards

The proposed convenience store will be Class 6 buildings in accordance with the National Construction Code, and as such, there is no statutory requirement for the building to meet the construction requirements of AS 3959. Notwithstanding, given the high-risk nature of the proposed use, and like all buildings, potential vulnerability to ember attack, JBS&G recommends that compliance with the AS 3959 construction requirements is achieved wherever practicable. It is recommended that as a minimum, the requirements of BAL-12.5 are considered for implementation as the construction requirements associated with this rating are primarily related to ember protection, which is primary form of bushfire attack in areas subject to BAL-12.5.

The proposed fast food outlet is not located within a designated bushfire prone area but is identified as being within an area of BAL-12.5. The developers may consider implementation of bushfire constructions standards (where practical) for this building as well.

5.3.2 High-risk land uses

The proposed development constitutes a high-risk land use. On this basis, a BRMP has been prepared to address the requirements of Policy Measure 6.6 (JBS&G 2023). The BRMP addresses bushfire risk management measures for flammable on-site hazards associated with the fuel storage component of the proposed development. The BRMP demonstrates that the risk associated with the proposed development is manageable.

5.3.3 Compliance with annual firebreak notice

The developer/land manager is to comply with the current City of Wanneroo annual firebreak notice (refer to Appendix F).

5.3.4 Road verge fuel management

Existing and proposed road verges that have been excluded as low threat are to be managed to ensure the understorey and surface fuels remain in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Ongoing road verge management is the responsibility of the City.

5.3.5 Management of on-site landscaping

The developer/land manager is to ensure ongoing management of on-site landscaping in a low threat state.

6. Responsibilities for implementation and management of the bushfire measures

Implementation of the BMP applies to the developer, prospective landowners and the City to ensure bushfire management measures are adopted and implemented on an ongoing basis. A bushfire responsibilities table is provided in **Table 4** to drive implementation of all bushfire management works associated with this BMP.

Table 4: Responsibilities for implementation and management of the bushfire measures

Implementation/management table	
Developer – prior to occupation of buildings	
No.	Implementation action
1	Establish non-vegetated/low threat areas across the project area to achieve ongoing exclusion over the development site in accordance with AS 3959 Clauses 2.2.3.2 (e) and (f) and Schedule 1 of the Guidelines.
2	Establish the internal vehicular access network in accordance with the minimum technical standards for private driveways under acceptable solution A3.6.
3	Consider implementation of AS 3959 construction standards where practicable, including consideration of ember protection mechanisms in accordance with a BAL-12.5 rating.
4	Install any internal reticulated fire water supply infrastructure (if relevant).
5	Implement all requirements of the project Bushfire Risk Management Plan (JBS&G 2023).
Landowner/facility manager – ongoing	
No.	Implementation action
1	Maintain non-vegetated/low threat areas across the project area to achieve ongoing exclusion over the development site in accordance with AS 3959 Clauses 2.2.3.2 (e) and (f) and Schedule 1 of the Guidelines.
2	Maintain the internal vehicular access network in accordance with the minimum technical standards for private driveways under acceptable solution A3.6.
3	Install any internal reticulated fire water supply infrastructure (if relevant).
4	Attend to ongoing review and implementation of the project Bushfire Risk Management Plan (JBS&G 2023).
5	Comply with the City of Wanneroo annual firebreak notice as amended.
City of Wanneroo – ongoing	
No.	Maintenance action
1	Maintain landscaping within Neerabup Road and Key Largo Drive verges in a low threat state.
2	Maintain public roads in accordance with the minimum technical standards for public roads under acceptable solution A3.1.

7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

8. References

- Department of Fire and Emergency Services (DFES) 2021, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: <https://maps.slip.wa.gov.au/landgate/bushfireprone/>, [19/10/2023].
- Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth.
- Hodge Collard Preston Architects 2023, *Site plan – Mixed commercial, corner of Key Largo Drive and Neerabup Rd, Perth (Rev A)*, Hodge Collard Preston Architects, Perth
- JBS&G 2023, *Bushfire Risk Management Plan: Lot 408 Neerabup Road, Service station development*, JBS&G, Bunbury/Perth.
- Standards Australia (SA) 2018, *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Strategen [now JBS&G] 2018, *Bushfire Management Plan: BMP Lot 408 Neerabup Road, Clarkson, Structure Plan application*, JBS&G, Bunbury/Perth.
- Strategen-JBS&G [now JBS&G] 2021, *Bushfire Management Plan: Lot 408 Neerabup Road, Clarkson, Development Application (Woolworths)*, JBS&G, Bunbury/Perth.
- Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas, Version 1.4 December 2021*, Western Australian Planning Commission, Perth.

Appendix A Deposited plan

Plan Information

Tenure Type	Freehold
Plan Type	Deposited Plan
Plan Purpose	Subdivision

Plan Heading

LOTS 1 , 2 , EASEMENT AND COVENANTS

Locality & Local Government

Locality	CLARKSON
Local Government	CITY OF WANNEROO

Department of Planning, Lands and Heritage

File Number

Examination

Examined _____ Date _____

Planning Approval

Planning Authority	WAPC
Reference	163213

Delegated under S. 16 P&D Act 2005 _____ Date _____

In Order For Dealings

Subject To _____

For Registrar of Titles _____ Date _____

Plan Approved

Inspector of Plans and Surveys _____ Date _____

Survey Details

Field Records	160787
Declared as Special Survey Area	NO

Survey and Plan Notation

Survey Certificate - Regulation 54

I, J . A . LAMPARD
 hereby certify that this plan is accurate and is a correct representation of the -
 (a) survey; and
 (b) calculations from measurements recorded in the field records,
 undertaken for the purposes of this plan and that it complies with the relevant
 written law(s) in relation to which it is lodged.

Licensed Surveyor _____ Date _____

Survey Organisation

Name	LPD SURVEYS
Phone	0467 573 789
Email	admin@lpdsurveys.com.au
Reference	22 - 1023

Amendments

Version	Lodgement Type	Amendment Description	Authorised By	Date
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Former Tenure

New Lot / Land	Parent Plan Number	Parent Lot Number	Title Reference	Subject Land Description
1 & 2	P23838	408	2183 - 316	LOT 408 ON P23838

Former Tenure Interests and Notifications

Subject	Purpose	Statutory Reference	Origin	Land Burdened	Benefit To	Comments
	MINERAL RESERVATION		DOCUMENT T7033/1940	LOTS 1 & 2		
	RESTRICTIVE COVENANT		DOC H263312	LOTS 1 & 2		
(6)	EASEMENT (SEWERAGE)	SEC 27A OF THE TP & D ACT REG 6	P23838	LOT 1	WATER CORPORATION	
(6A)	EASEMENT (SEWERAGE)	SEC 27A OF THE TP & D ACT REG 6	P23838	LOT 1	WATER CORPORATION	
(C)	EASEMENT	SEC 195 & 196 OF THE LAA	DOC H353687	LOT 1	CITY OF WANNEROO	
(C)1	EASEMENT	SEC 195 & 196 OF THE LAA	DOC H353687	LOT 1	CITY OF WANNEROO	

New Interests

Subject	Purpose	Statutory Reference	Origin	Land Burdened	Benefit To	Comments
(A)	RIGHT OF CARRIAGEWAY	SEC 136C OF THE TLA	THIS PLAN	LOT 1	LOT 2	
(D) TO (E)	COVENANT	SEC 150 OF THE P & D ACT	THIS PLAN	LOTS 1 & 2	CITY OF WANNEROO	NO VEHICLE ACCESS IS PERMITTED TO & FROM KEY LARGO DRIVE
(F) TO (G)	COVENANT	SEC 150 OF THE P & D ACT	THIS PLAN	LOTS 1 & 2	CITY OF WANNEROO	NO VEHICLE ACCESS IS PERMITTED TO & FROM KEY LARGO DRIVE AND NEERABUP ROAD
(H) TO (J)	COVENANT	SEC 150 OF THE P & D ACT	THIS PLAN	LOT 1	MAIN ROADS WESTERN AUSTRALIA	NO VEHICLE ACCESS IS PERMITTED TO & FROM NEERABUP ROAD AND MARMION AVENUE

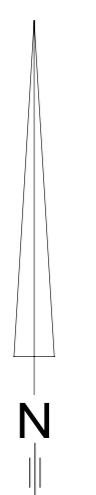
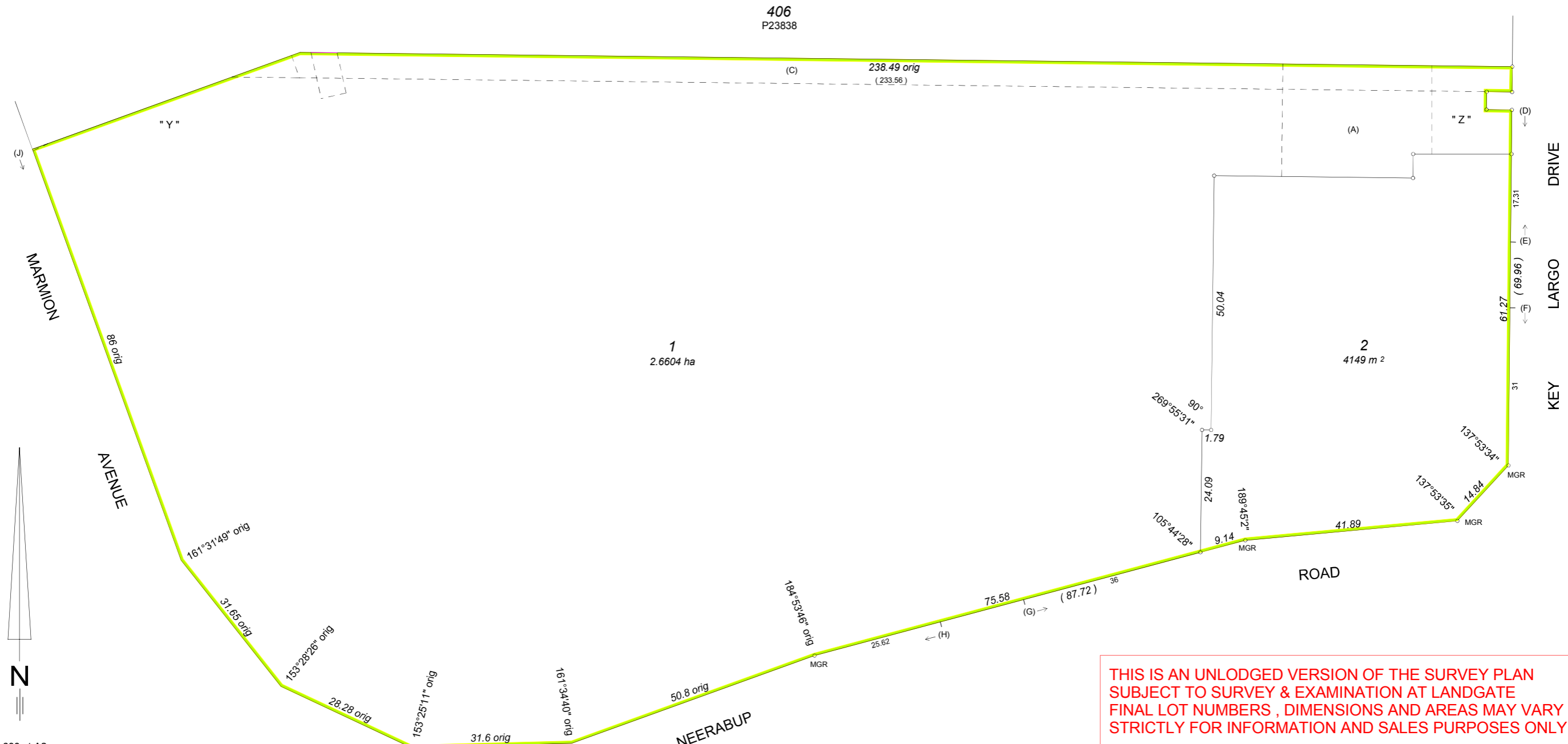
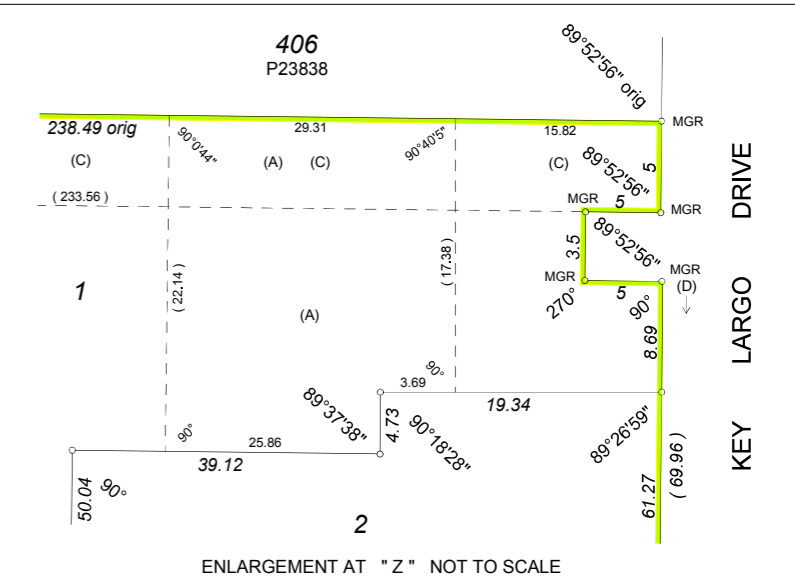
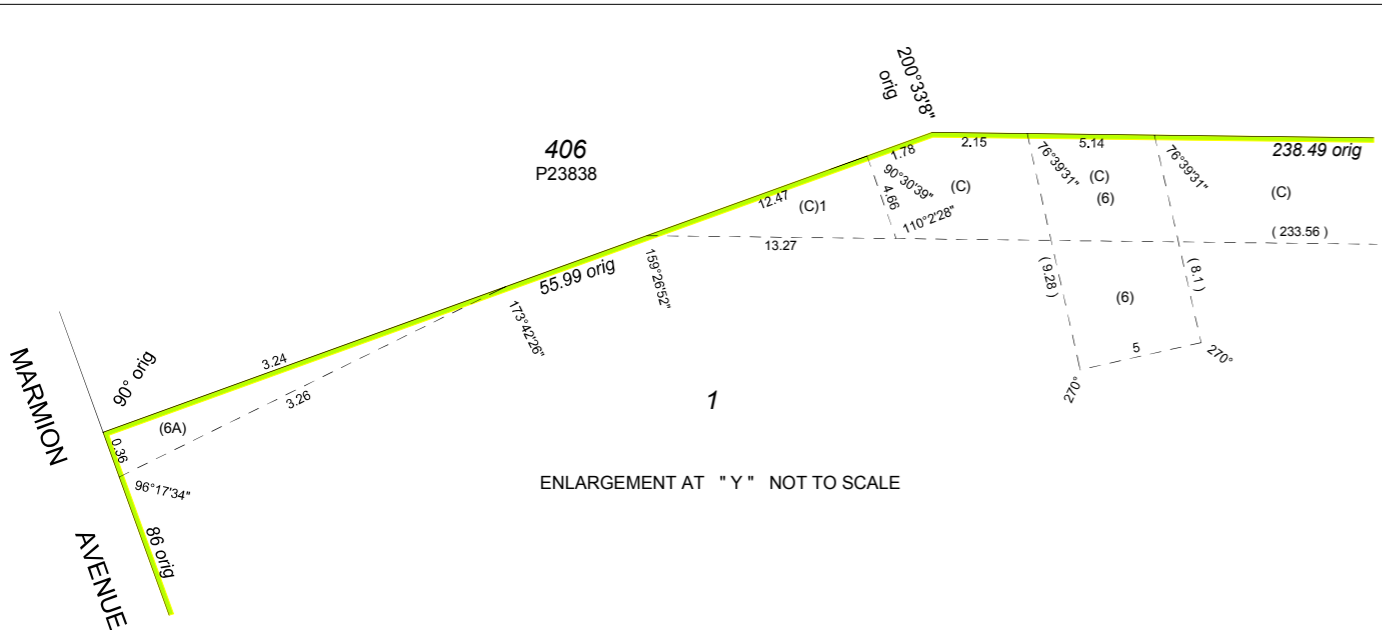
New Memorials and Notifications

Subject	Purpose	Statutory Reference	Origin	Land Burdened	Benefit To	Comments
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Vesting Lots

Land	Purpose	Statutory Reference	Origin	Comments
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THIS IS AN UNLODGED VERSION OF THE SURVEY PLAN SUBJECT TO SURVEY & EXAMINATION AT LANDGATE FINAL LOT NUMBERS , DIMENSIONS AND AREAS MAY VARY STRICTLY FOR INFORMATION AND SALES PURPOSES ONLY



1 : 600 at A2



THIS IS AN UNLODGED VERSION OF THE SURVEY PLAN
SUBJECT TO SURVEY & EXAMINATION AT LANDGATE
FINAL LOT NUMBERS , DIMENSIONS AND AREAS MAY VARY
STRICTLY FOR INFORMATION AND SALES PURPOSES ONLY



LIPID SURVEYS
LICENSED SURVEYORS





SHEET	SHEETS	VERSION NUMBER	DEPOSITED PLAN
2	OF 2	1	424627

Appendix B Landscape plan

PLANTING SCHEDULE						
GARDEN BED	CODE	BOTANICAL NAME	POT SIZE	QUANTITY	MATURE SIZE (APPROX)	REVISION
GB01						
MIX 1	1pm ²					
	Erc	Eremophila kalbari carper	140mm	165	H 0.4m x W 0.1m	
	Con	Conostylis candicans	140mm	165	H 0.5m x W 0.5m	
	Asc	Acacia saligna prostrate	140mm	165	H 0.3m x W 1m	
	Hib	Hibertia Scandens	140mm	181	H 0.4m x W 1m	
	Cav	Carpobrotus virescens	140mm	165	H 0.2m x W 1m	
	Ggg	Grevillia gin gin gem	140mm	165	H 0.4m x W 1m	
SHRUBS						
	Ad	Patersonia occidentalis	140mm	26	H 0.5m x W 1m	
	Caj	Callistmon Little john	140mm	47	H 1.5m x W 1m	
	Awb	Acacia wattle hunny bun	140mm	20	H 1m x W 1m	
	Bad	Banksia ashbia Dwarf	140mm	6	H 1.5m x W 2m	
TREES						
	MEL	Melaleuca Leucodendron	35L	7	H 10m x W 4m	

LANDSCAPE LEGEND

SURFACE FINISHES PLANS

-  Mix 1 100mm mulch to Imported topsoil to Garden Bed To be drip line Reticulated 1 x 140MM Pots p/ms
-  Proposed native tree species
-  Proposed native shrub species
-  Site boundary

PLANTING NOTES:

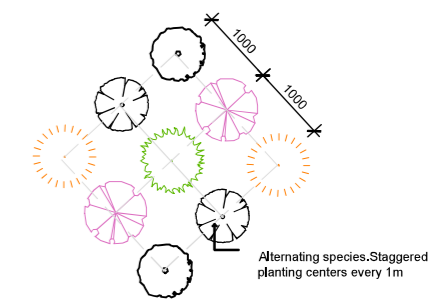
1. REMOVE NURSERY STAKES AND LABELS AT THE TIME OF PLANTING. PLANTS ARE TO BE SELF-SUPPORTING.
2. JARRAH WOODCHIP MULCH
3. CONDITIONER @20mm TO ALL PLANTING AREAS

IRRIGATION NOTES:

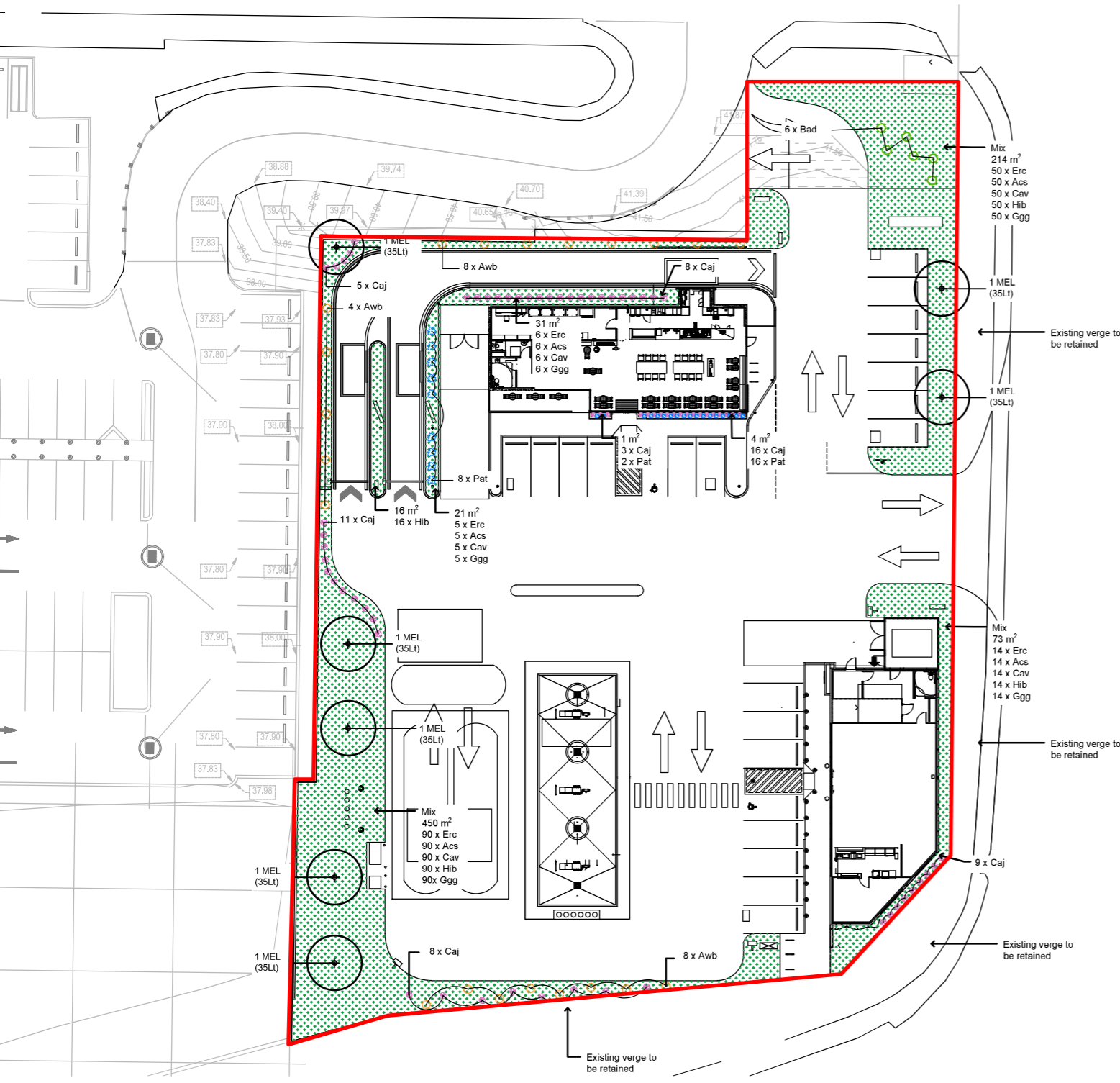
- CONTROLLER LOCATION TO BE CONFIRMED ON SITE.
- THE CONTRACTOR IS RESPONSIBLE FOR LAYOUT DESIGN AND INSTALLATION OF IRRIGATION SYSTEM.
- AT TIME OF COMPLETION THE IRRIGATION SYSTEM SHALL BE FULLY AUTOMATED, WORKING EFFICIENTLY AND EFFECTIVELY AND WATERING TIMES PROGRAMMED.
- LOW FLOW DRIP LINE IRRIGATION TO ALL GARDEN BEDS
- WATER SUPPLY VIA SCHEME

TYPICAL IRRIGATION SPECS:

1. MAINLINE: 25MM CLASS 9 PVC WITH 13 CORE 0.5MM MULTICORE CONTROL CABLE.
2. VALVES: RAINBIRD HV WITH 7INCH RAINBIRD VALVE BOXES.
3. LATERAL MANIFOLDS: 25MM LOW DENSITY POLY WITH STAINLESS STEEL COBRA CLIPS ON ALL JOINS.
4. DRIP LINE: NETAFIRM 13MM @ 30CM SPACINGS @ 2 LITERS PER HOUR.



Staggered Planting
Plan Scale 1:100



REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION
0	23/10/2023	ISSUE FOR PERMIT APPROVAL			
1	2/11/2023	ISSUE FOR PERMIT APPROVAL			

PROJECT: 711 STARBUCKS CLARKSON, WA
CNR OF KEY LARGO DR & NEERABUP RD, PERTH

CLIENT: **Clarkson Central Pty Ltd**

DRAWING: **LANDSCAPE PLANTING PLAN**

DWG NO: L-1100

DRAWN: EQ REVIEWED: EQ PROJECT NUMBER: 2316

SCALE: 1:500 @ A3

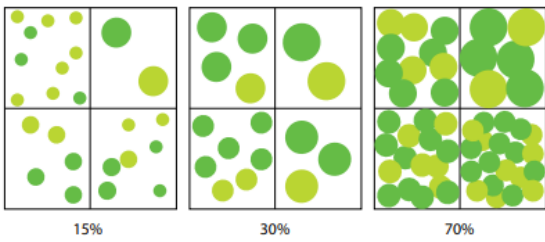
DATE: 2/11/2023

REV: 1

NOTE:
1. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN. THIS IS A CAD DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS, LEVELS AND ANGLES ON SITE BEFORE PROCEEDING WITH THE WORK. ELSHA QUINTAL STUDIOS SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES.
3. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATIONS AND DRAWINGS.
4. ANY FORM OF REPRODUCTION OF THIS DRAWING IN FULL OR IN PART WITHOUT WRITTEN PERMISSION FROM ELSHA QUINTAL, CONSTITUTES AN INFRINGEMENT OF COPYRIGHT.



Appendix C Asset Protection Zones – Standards and explanatory notes from the Guidelines

Schedule 1: Standards for Asset Protection Zones	
Object	Requirement
Fences within the APZ	<ul style="list-style-type: none"> Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	<ul style="list-style-type: none"> Should be managed and removed on a regular basis to maintain a low threat state. Should be maintained at <2 tonnes per hectare (on average). Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	<ul style="list-style-type: none"> Trunks at maturity should be a minimum distance of six metres from all elevations of the building. Branches at maturity should not touch or overhang a building or powerline. Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. Canopy cover within the APZ should be <15 per cent of the total APZ area. Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. <p style="text-align: center;">Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity</p>  <p style="text-align: center;">15% 30% 70%</p>
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	<ul style="list-style-type: none"> Should not be located under trees or within three metres of buildings. Should not be planted in clumps >5 square metres in area. Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	<ul style="list-style-type: none"> Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	<ul style="list-style-type: none"> Grass should be maintained at a height of 100 millimetres or less, at all times. Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	<ul style="list-style-type: none"> Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	<ul style="list-style-type: none"> Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. The pressure relief valve should point away from the house. No flammable material within six metres from the front of the valve. Must sit on a firm, level and non-combustible base and be secured to a solid structure.

Element 2 Explanatory Notes

E2 Landscaping and design of an Asset Protection Zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m². It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m² clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m² (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and

crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;
- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.
- Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Appendix D Photos of vegetation plots

Plot 1

Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub

Description / justification

Scrub vegetation with continuous horizontal and vertical fuel structure within POS to the south of Neerabup Road.



Photo ID: 1a



Photo ID: 1b



Photo ID: 1c



Photo ID: 1d

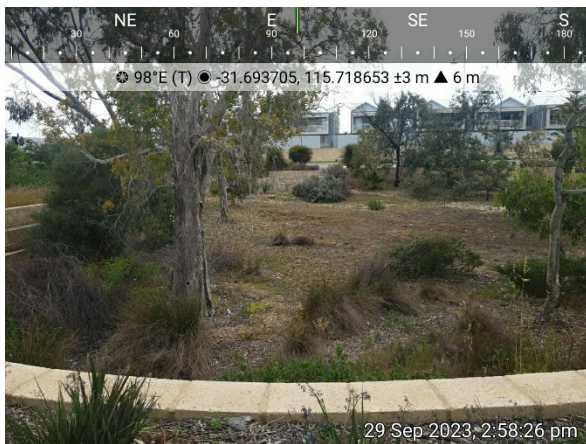


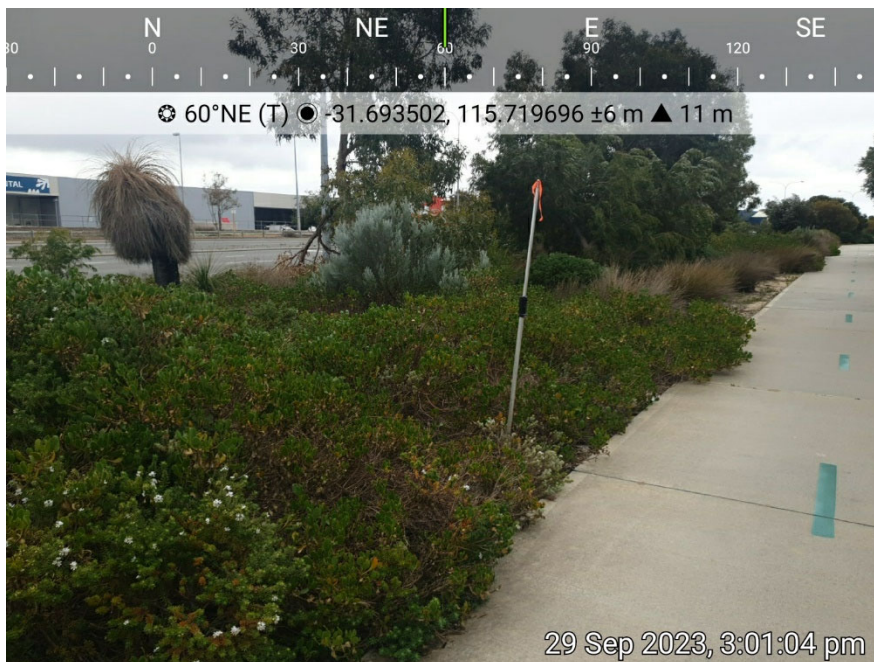
Photo ID: 1e

Plot 2

Vegetation classification	Pre-development	Excluded – Clause 2.2.3.2 [d]
	Post-development	Excluded – Clause 2.2.3.2 [d]

Description / justification

Verge landscaping consisting of native scrub and groundcover species to the south of Neerabup Road. Excluded from the assessment do to being a strip of vegetation less than 20 m width and not within 20 m of the project area or other areas of classified vegetation.


Photo ID: 2a

Photo ID: 2b

Plot 3

Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])

Description / justification

Plot comprises existing areas of low threat land, including roads, and paved areas, managed parklands, commercial and residential properties and the cleared project area.



Photo ID: 3a



Photo ID: 3b

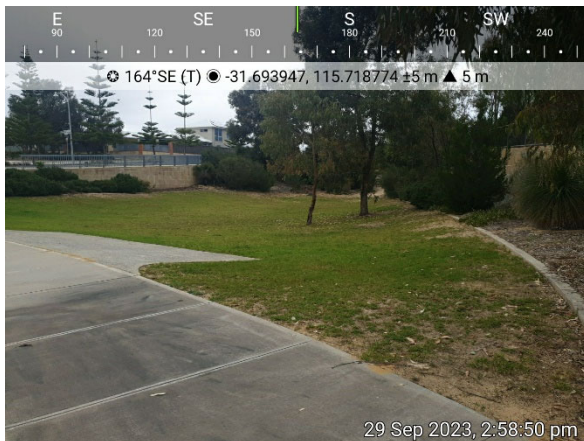


Photo ID: 3c



Photo ID: 3d

Appendix E Vehicular Access – explanatory notes from the Guidelines

Acceptable Solution A3.1 – Public Roads

Explanatory Note E3.1

These Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area.

The IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards do not prescribe a horizontal clearance. However, it is recommended that a traversable verge is provided to allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road may traverse large areas of classified vegetation.

Where local government roads are proposed to be widened by the proponent, they must obtain approval from the local government.

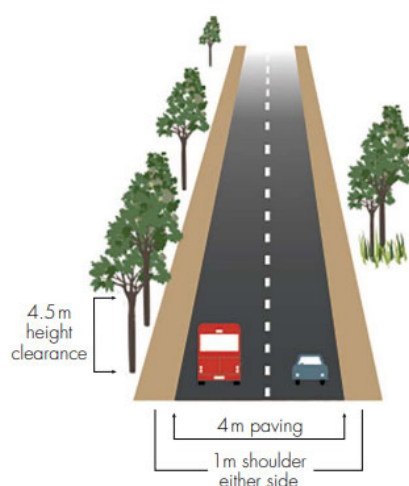


Figure 20: Example of a public road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.2a – Multiple access routes

Explanatory Note E3.2a

Two-way public road access is public road access from a lot in at least two different directions to two suitable destinations, and provides residents and the community, as well as emergency services, with access and egress from both the subdivision and individual habitable buildings/development in the event of a bushfire emergency. A single road provides no alternative route if the access becomes congested or is unable to be traversed due to smoke and/or fallen trees during a bushfire.

Two-way public road access applies to access/egress routes leading into a subdivision, as well as those within a subdivision. A road that loops back onto itself does not constitute the option of two different directions.

Two-way public road access should always be the first option. Where the site is not able to achieve two-way access within 200 metres of the lot boundary, due to demonstrated site or environmental constraints, the proponent should identify options for an emergency access way from the subject site to a suitable destination. Where an emergency

access way cannot be provided, the proponent should demonstrate compliance with the performance principle.

Subject sites or proposed lots greater than 200 metres from an intersection, which provides two-way access, do not satisfy the requirement for two-way access unless they meet the provisions which allow for no-through roads greater than 200 metres in A3.2a.

To demonstrate compliance with the performance principle for two-way access, the bushfire planning practitioner may have regard to:

- the extent of the bushfire hazard, location and vegetation classification, the likelihood, potential severity and impact of bushfire to the subject site and the road network;
- time between fire detection and the onset of conditions in comparison to travel time for the community to evacuate to a suitable destination;
- available access route(s) travelling towards a suitable destination; and
- turn-around area for a fire appliance for no-through roads.

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

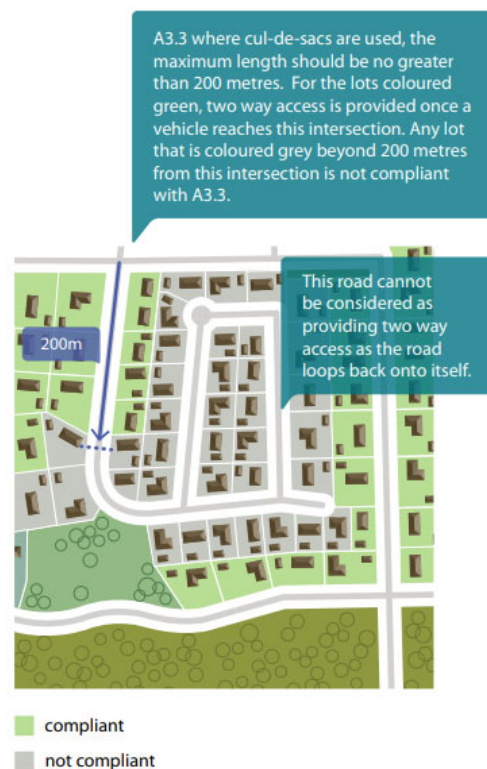


Figure 21: Example of compliant and non-compliant two-way

Acceptable Solution A3.3 – Through roads

Explanatory Note E3.3

In bushfire prone areas, a proposed structure plan or subdivision that incorporates no-through roads should be avoided because they do not provide a connected and legible design that allows for easy access and egress by the community, residents and emergency services in the event of a bushfire. No-through roads also reduce the options available for access and egress in the event of a bushfire emergency.

There will however be situations where a subject site is accessed via an existing or proposed no-through road and alternative access cannot be provided. In these situations, the proponent should demonstrate to the decision-maker, that all efforts have been made with the local government and/or adjoining landowners to secure alternative public road access or an emergency access way and that a redesign has been explored. The bushfire planning practitioner may need to develop a performance principle-based solution or address the non-compliance and demonstrate to the decisionmaker why discretion should be exercised in accordance with section 2.6 of these Guidelines.

No-through roads will only be considered an acceptable solution where it is demonstrated by the proponent, to the satisfaction of the decision maker, that a no through-road cannot be avoided due to site constraints. For example, the internal road design of a structure plan or subdivision where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a no through road may be a more appropriate road layout.

No-through roads should be a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided and may only exceed 200 metres if it meets the provisions which allow for no-through roads greater than 200 metres in A3.2a.

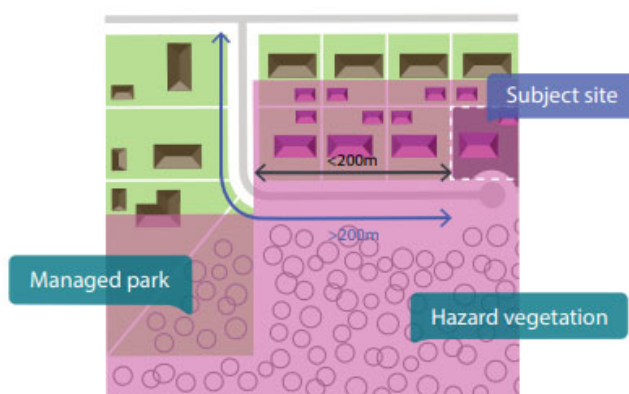


Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW

Acceptable Solution A3.3 – Through roads

Explanatory Note E3.3

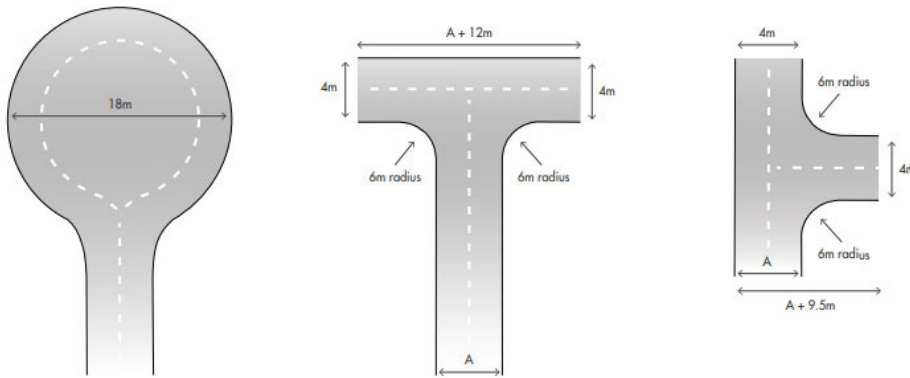


Figure 24: Turn-around area dimensions for a no-through road

Source: Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)

Acceptable Solution A3.6 – Private driveways

Explanatory Note E3.6

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

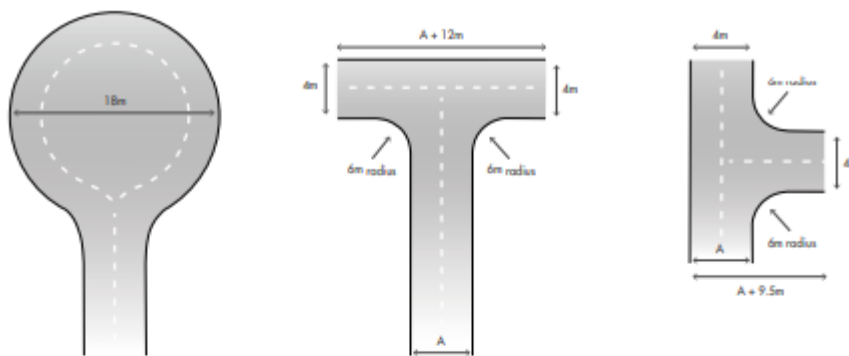


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

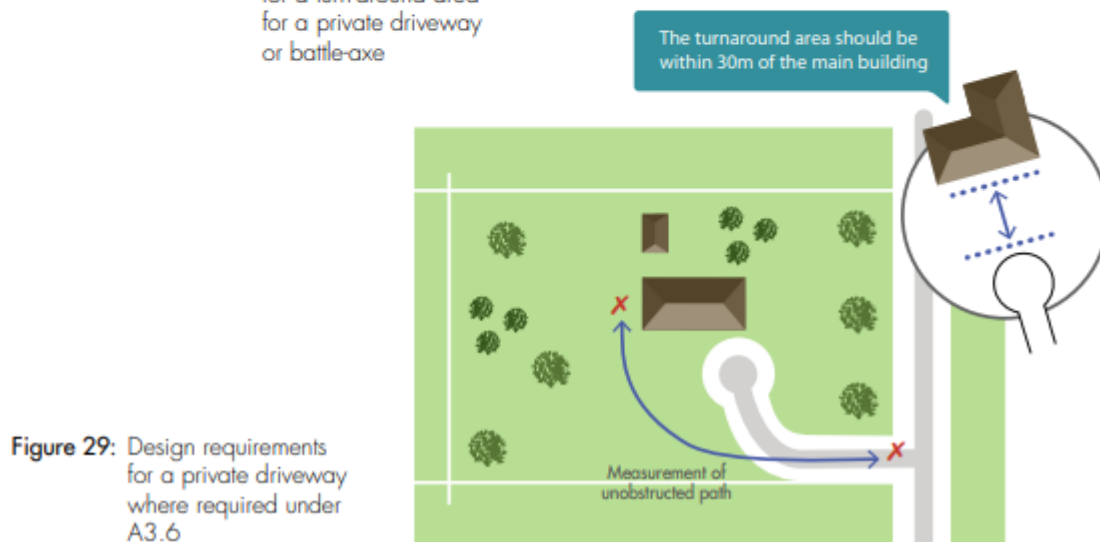


Figure 29: Design requirements for a private driveway where required under A3.6

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Technical requirement	1	2	3	4
	Public road	Emergency access way ¹	Fire service access route ¹	Battle-axe and private driveways ²
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (m)	N/A	6	6	6
Minimum vertical clearance (m)	4.5	4.5	4.5	4.5
Minimum weight capacity (t)	15	15	15	15
Maximum grade unsealed road ³	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Maximum grade sealed road ³		1:7 (14.3%, 8°)	1:7 (14.3%, 8°)	1:7 (14.3%, 8°)
Maximum average grade sealed road		1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Minimum inner radius of road curves (m)		8.5	8.5	8.5

¹ To have crossfalls between 3 and 6%

² Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision

³ Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Appendix F City of Wanneroo firebreak notice

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Proposed service station, proposed Lot 2 Neerabup Road, Clarkson

Clarkson Central Pty Ltd

Bushfire Risk Management Plan

JBS&G 65672 | 155,254

3 November 2023





We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte



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1. Introduction

1.1 Background

Clarkson Central Pty Ltd is lodging a development application in relation to a proposed commercial development within proposed Lot 2 (currently Lot 408 Neerabup Road), Clarkson (the project area), located in the City of Wanneroo. The site plan identifies that the proposed development will comprise the following elements:

- convenience store (200 m²)
- fast food outlet (220 m²) and alfresco (30 m²)
- fuel canopy – including three pumps and six bays
- parking bays
- landscaping
- one crossover to Key Largo Drive
- vehicular access connection to the Woolworths internal access road.

The project area is designated as being bushfire prone on the *WA Map of Bush Fire Prone Areas* (DFES 2021) due to native vegetation located within 100 m of the site which triggers bushfire planning requirements under *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015).

In accordance with SPP 3.7 Policy Measure 6.5, a Bushfire Management Plan (BMP) is required to accompany the development application to inform planning at that stage. The BMP was prepared by JBS&G (2022) and it to be read in conjunction with this report.

Additionally, SPP 3.7 Policy Measure 6.6 requires development applications for high-risk land uses (such as service stations) in areas between BAL-12.5 and BAL-29, to have a BMP which is accompanied by a bushfire risk management plan (BRMP). The BMP prepared by JBS&G for the site (JBS&G, 2023) identifies the project area as being located within an area of greater than BAL-12.5, and as such, the development requires the preparation of a BRMP.

Under the *Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007*, the operator will also be required to complete a separate risk assessment that addresses risks other than bushfire for the proposed service station and the associated Dangerous Goods.

1.2 Aim and objectives

The aim of this BRMP is to guide the bushfire protection measures within the project area through mitigation responses developed on the basis of a comprehensive bushfire risk assessment.

Key objectives include:

1. Undertake a bushfire risk assessment of the potential bushfire scenarios that could affect the proposed development, as well as assets on adjoining land.
2. Undertake a bushfire risk assessment of the potential scenarios at the proposed development that could result in increased likelihood of bushfire.
3. Provide independent advice and recommendations on the location, method and timing of appropriate bushfire mitigation measures that promote protection of life and property as a priority.

2. Potential bushfire scenarios

The BMP (JBS&G 2023) identifies and classifies the post-development bushfire hazards within 150 m of the project area. This information, along with an assessment of the wider risk profile, has been used to assess the bushfire scenarios that have potential to impact the project area. The potential bushfire scenarios have been used to inform a bushfire risk assessment (refer to Section 4) and assist in development of appropriate bushfire mitigation responses (refer to Section 5).

The following bushfire scenarios were assessed:

1. Bushfire approaching the proposed development site from the south.
2. Fire originating within the proposed development site, igniting a bushfire.

A description of each potential bushfire scenario is provided in the following subsections.

2.1 Scenario 1: Bushfire approaching the project area from the south

The project area is located within a predominantly built-up urban landscape however sits at the interface between native vegetation within Reserve 52272, directly south of Neerabup Road. This vegetation is contiguous with a wider extent of coastal scrubland located both east and west of Marmion Avenue, extending approximately 2.2 km south to the built-up suburb of Kinross and 3 km southwest to the suburb of Burns Beach.

Under predominant afternoon summer weather conditions, the likely prevailing winds are from the east and southwest in the morning and southwest in the afternoon. A fire front approaching the project area from the southwest, south or southeast is therefore considered to be the worst-case bushfire scenario due to the prevailing winds and presence of extended fire runs through contiguous scrub.

The potential impact from a bushfire approaching the project area from the south is considered to be low to moderate. Although there is potential for a bushfire to occur within vegetation to the south, the vegetation extent narrows within Reserve 52272 to approximately 180 m which will moderate fire behaviour compared a fire occurring within the open areas further south. Portofino Promenade (approx. 550 m to the south) also provides a 20 m firebreak which may prevent fire spread from vegetation within the wider landscape.

Neerabup Road provides a substantial buffer between the vegetation and proposed development, which will limit the potential for a fire to reach the site and enable a direct fire suppression response at the interface with development.

Low threat landscaping will ensure bushfire impacts are limited to BAL-12.5 for the proposed fuel bowsters (high-risk land use) and habitable buildings which is likely to correspond to low levels of radiant heat impact and ember attack.

Vehicular access for evacuation purposes will be available to the north via Key Largo Drive in a direction away from the hazard, then in all directions via the public road.

Firefighter access to the project area can be achieved from Neerabup Road in the south, Key Largo Drive in the east, or the Woolworths access road in the north. Fighting water supply will be provided by adjacent on-street hydrants on Key Largo Drive.

As outlined above, the potential impact from bushfire approaching the proposed development from the south will be moderated by buffers between the fuels and the development site. Minor radiant heat impact and ember attack would be anticipated from a bushfire approaching from the south, with the bushfire risk to the project area expected to be managed as per the bushfire management measures proposed in the BMP (JBS&G, 2023).

2.2 Scenario 2: Fire originating within project area

Scenario 2 reviews the potential risk of the proposed development to increase the likelihood of bushfire within the surrounding area.

One potential risk is the likelihood of increased ignition sources at the proposed development by igniting nearby vegetation, flammable liquids or other combustible items to create a bushfire. Due to the nature of the proposed development, and the presence of Dangerous Goods within the site, the operators will be required to ensure there are strict controls on the potential ignition sources, such as hot works and electrical equipment, within any on-site hazardous areas.

Controls are outlined in Section 5.2 to primarily to ensure that life safety is maintained at an appropriate level, in addition to providing a level of property protection, rather than to specifically prevent bushfire ignition. However, the trickledown effect is that reducing the likelihood of fire ignition on the site also ensures the likelihood of bushfire ignition is not increased from that of other built environment land uses.

If a fire were to ignite at the site, it is expected that staff would immediately contact the fire brigade and that fire services would turnout quickly to attend a fire at the service station. Fire brigade notification would also be likely from customers and other nearby public. It is unlikely that a fire would spread to the bushland south of Neerabup Road given the road reserve provides an approximately 40 m buffer between the project area and vegetation hazards.

Fire service access to the site is readily achievable via connection to Key Largo Drive or Neerabup Road. The nearest DFES Fire and Rescue Station is Butler Station, located approximately 5 km (7 mins driving time) from the project area. Joondalup Station is also located within 10 mins driving distance. Given the relatively quick onsite turnout expected, it is anticipated that fire services will address any spot fires, including fire ignition in adjacent vegetation, to prevent uncontrolled fire behaviour.

3. Bushfire risk assessment methodology

Australian Standard *AS ISO 31000:2018 Risk Management—Principles and Guidelines* (SA 2018) provides an internationally recognised approach to risk management. ISO 31000 has been adopted by the Department of Fire and Emergency Services (DFES) Office of Bushfire Risk Management (OBRM), as documented in the agency’s *Guidelines for Preparing a Risk Management Plan* (DFES 2015) to formalise and communicate the approach of managing bushfire risk across the department in the aim of leading to improved coordination and effectiveness of bushfire risk management processes. These Guidelines have been designed for use by Local Governments as a framework to develop bushfire specific risk management plans for their local area.

Plate 1: Risk management process as per DFES Guidelines (Source: DFES, 2015)

provides a summary of the risk management process in accordance with the DFES Guidelines. Each of the steps in the process are further described in the following subsections.

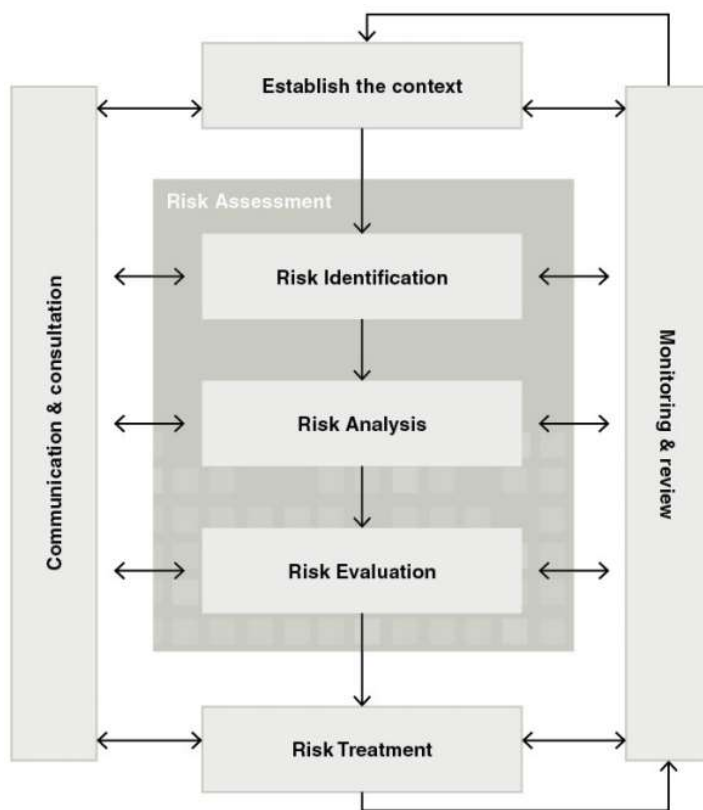


Plate 1: Risk management process as per DFES Guidelines (Source: DFES, 2015)

JBS&G has adopted the methodology described in the DFES Guidelines on the basis that this approach provides a bushfire specific assessment of risk. Some of the definitions for likelihood and consequence ratings have been modified to suit the scope of this BRMP which is at the facility level, rather than the community level which is relevant to Local Governments.

From a bushfire management perspective, this methodology can be useful in determining:

1. The *inherent* bushfire risk (i.e. the initial level of risk prior to risk treatment and mitigation).
2. The *residual* bushfire risk (i.e. the level of risk remaining following risk treatment and mitigation).

3.1 Assessing likelihood

Likelihood is defined as *the chance of a bushfire igniting, spreading and reaching an asset.*

Table 1: Likelihood rating system

Likelihood rating	Description
Almost certain (sure to happen)	<ul style="list-style-type: none"> Expected to occur in most circumstances High level of recorded incidents and/or strong anecdotal evidence; and/or Strong likelihood that event will recur; and/or Great opportunity, reason or means to occur May occur more than once in five years.
Likely (probable)	<ul style="list-style-type: none"> Regular recorded incidents and strong anecdotal evidence and/or Considerable opportunity, reason or means to occur May occur at least once in five years.
Possible (feasible but less than probable)	<ul style="list-style-type: none"> Should occur at some stage; and/or Few, infrequent, random recorded incidents or little anecdotal evidence; and/or Some opportunity, reason or means to occur.
Unlikely (improbable, not likely)	<ul style="list-style-type: none"> Would only occur under exceptional circumstances.

3.2 Assessing consequence

Consequence is defined as *the outcome or impact of a bushfire event on people, property and the environment, taking into consideration the degree and severity of potential bushfire scenarios, location of bushfire hazard areas, assets present in the area and the level of management and suppression response available.*

Table 2: Consequence rating system

Consequence rating	Description
Catastrophic	<ul style="list-style-type: none"> Multiple cases of fatalities and extensive number of severe injuries. Large proportion of people requiring hospitalisation. Extensive displacement of persons for extended duration. Extensive resources required for personal support. Extensive damage to assets that will require significant ongoing recovery efforts and extensive external resources. Facility unable to function without significant support. Long-term failure of significant infrastructure and service delivery affecting all parts of the facility. Permanent damage to environmental or cultural assets.
Major	<ul style="list-style-type: none"> Isolated cases of fatalities. Multiple cases of serious injuries. Significant hospitalisation. Large number of persons displaced for more than 24 hours. Significant resources required for personal support. Significant damage to assets, ongoing recovery efforts and external resources required. Facility only partially functioning, widespread inconvenience with services unavailable. Mid-to long term failure of significant infrastructure and service delivery affecting large parts of the facility. Economic impacts for a significant period of time with significant financial assistance required. Significant damage to environmental or cultural assets that require major rehabilitation or recovery efforts.
Moderate	<ul style="list-style-type: none"> Isolated cases of injuries, but no fatalities. Some hospitalisations required. Isolated cases of displaced persons who return within 24 hours. Personal support satisfied through facility arrangements. Localised damage to assets rectified by routine arrangements.

Consequence rating	Description
	<ul style="list-style-type: none"> Facility functioning as normal with some inconvenience. Isolated cases of short to mid-term failure of infrastructure and disruption to service delivery. Economic impacts with additional financial support required to recover. Isolated cases of damage to environmental or cultural assets.
Minor	<ul style="list-style-type: none"> No fatalities. Near misses or minor injuries with first aid treatment possibly being required. No persons displaced. Little or no personal support required. Inconsequential or no damage to an asset, with little or no specific recovery effort required beyond the immediate clean-up. Inconsequential or no disruption to facility. Inconsequential short-term failure of infrastructure or service delivery. Inconsequential or no financial loss.

3.3 Determining the risk rating

The two bushfire scenarios discussed in Section 2 have been subject to bushfire risk assessment through determination of likelihood and consequence in accordance with the rating tables outlined in Table 1 and Table 2.

This process determines the inherent bushfire risk of the event and informs the level of mitigation or management response required to reduce the risk to an acceptable level. The risk assessment matrix used to determine inherent and residual bushfire risk is outlined in Table 3.

Table 3: Risk assessment matrix and treatment priorities

		Consequence rating			
		Minor	Moderate	Major	Catastrophic
Likelihood rating	Almost certain	High (3D)	Very High (2C)	Extreme (1C)	Extreme (1A)
	Likely	Medium (4C)	High (3A)	Very High (2A)	Extreme (1B)
	Possible	Low (5A)	Medium (4A)	High (3B)	Very High (2B)
	Unlikely	Low (5C)	Low (5B)	Medium (4B)	High (3C)

The risk ratings also provide a treatment priority which determines the order, importance or urgency for allocation of resources to apply the treatment strategies. Treatment of assets with an extreme risk rating should be addressed before assets with lower risk ratings. A treatment priority of 1A is the highest priority and a treatment priority of 5C is the lowest priority.

3.4 Risk evaluation

The purpose of evaluating risk is to confirm that the risk ratings for each asset are appropriate, identify treatment priorities (as discussed previously) and identify which assets require treatment.

The acceptability of a risk level can be evaluated using the criteria listed in Table 4. Some risk ratings may be acceptable without any treatment (e.g. Low risk ratings) while the risk to others may be suitable with standard management controls (e.g. Medium and High risk ratings). Determining the

acceptability of risk allows decisions to be made on whether treatment is required or whether routine controls are sufficient.

Table 4: Risk acceptability

Risk rating	Priority	Risk acceptability
Extreme	1A, 1B, 1C	Unacceptable risk – only acceptable with excellent controls. An urgent mitigation response is required to lower the risk level.
Very High	2A, 2B, 2C	Unacceptable risk – only acceptable with excellent controls. A mitigation response is required to lower the risk level.
High	3A, 3B, 3C, 3D	Potentially unacceptable risk - only acceptable with adequate controls. Development of a mitigation response may be required to lower the risk level.
Medium	4A, 4B, 4C	Potentially unacceptable risk - only acceptable with adequate controls. A mitigation response may not be required to lower the risk level but the risk must be monitored regularly.
Low	5A, 5B, 5B	Acceptable risk with routine controls. Application of standard management measures will ensure risk level remains low. Treatment action is not required, but the risk must be monitored.

3.4.1 Risk treatment

The purpose of risk treatment is to reduce the likelihood of a bushfire occurring and/or the potential impact of a bushfire on an asset or facility. This is achieved by implementing treatment strategies that modify the characteristics of the risk, the asset/facility or the environment.

Treatment strategies will depend on the level of risk to the asset and the type of asset being treated. Asset specific bushfire mitigation strategies are generally based on fuel management, ignition management, preparedness, planning and engagement of personnel.

3.4.2 Monitoring and review

The effectiveness of each stage and effectiveness of risks and treatment strategies are monitored and any new risks are detected.

4. Bushfire risk assessment

4.1 Risk context

Risk is being assessed to inform bushfire mitigation for the project area for the protection of life and property within and adjacent to the site. The risk assessment adopts a broad area and supports a tenure blind approach to ensure wider risk impacts and adjoining lands are captured to suitably address potential risk.

4.2 Risk identification

Bushfire risk is identified in the potential bushfire scenarios outlined in Section 2 which indicate the potential bushfire events that could impact life and property within the project area and adjacent land. These scenarios are considered to cover the majority of bushfire events that could occur in order to develop suitable mitigation and manage as much of the bushfire risk as possible.

4.3 Risk analysis and evaluation

Risk analysis and evaluation for each of the potential bushfire scenarios is provided in Table 5, which specifies the likelihood and consequence of each scenario with and without management measures to determine inherent and residual risks.

Due to the storage and handling of flammable materials within the project area, the potential consequence of a bushfire entering the site would be greater than if flammable materials were not present.

JBS&G is of the view that following implementation of management measures, the risk of ignition will not be reduced due to the ongoing level of staff and visitor occupancy and presence of off-site bushfire prone vegetation and on-site flammable goods. Therefore, bushfire risk management measures are likely to reduce the level of consequence resulting from the bushfire event, rather than the likelihood of the event occurring. For example, an evacuation plan will reduce the potential impacts on life; thus reducing the level of consequence received from the bushfire event, but the likelihood of the event occurring will not be reduced.

4.4 Risk treatment

Risk treatment is discussed in Section 5, which outlines the management measures that will be implemented.

As with all bushfire management work, protection of life and property is afforded the highest priority.

Table 5: Bushfire risk assessment

Bushfire scenario	Comments	Likelihood	Consequence	Inherent risk level	Mitigation/management	Likelihood	Consequence	Residual risk level
<u>Scenario 1</u> Bushfire approaching the project area from the south	See Section 2.1	Possible	Moderate	Medium (4A)	Implementation of management measures identified in Section 5	Possible	Minor	Low (5A)
<u>Scenario 2</u> Fire originating within project area and spreading to bush to the south	See Section 2.2	Unlikely	Moderate	Low (5B)	Implementation of management measures identified in Section 5	Unlikely	Minor	Low (5C)

5. Bushfire management measures

Implementation of the management measures provided in the following subsections prioritises protection of life and property and will mitigate inherent bushfire risk within the project area.

5.1 Vegetation management

A Landscape Plan has been prepared and demonstrates that all vegetation established internal to the development site will consist of low threat vegetation in accordance with Asset Protection Standards (APZ) set out in Schedule 1 of the Guidelines (and as documented in the BMP).

5.2 Fuel control measures

Should a fire ignite at the service station, trained staff are able to use the following measures to control the flow of fuel to the dispensers:

- press 'Stop Pump' button at the point of sale to stop individual fuel dispensers and turn off dispenser/s at switchboard to prevent accidental usage
- press 'Emergency Stop All Pumps' button at the point of sale to stop all fuel dispensers
- turn Mains Power off at switchboard.
- warn customers using PA system to not start cars and clear 15m away from area
- if emergency escalates, evacuate all people and customers from the site and advise them to assemble at the Evacuation Assembly Area. Customers to remain at assembly area until site is declared safe by emergency services, at which time they may return to their cars
- use spill kit for small spills to absorb spill and prevent from entering the drain by blocking entrance to drain using kit
- if fire occurs in the store:
 - ensure everyone has evacuated
 - if safe to do so, fight fire with fire extinguisher ensuring egress route is maintained
 - do not let anyone enter store until it is declared safe by emergency services.

5.3 Fire protection and suppression equipment

Fire extinguishers are to be located within the project area, in accordance with the National Construction Code and AS 2444. Only personnel trained in the use of extinguishers should be utilising this equipment and only if safe to do so.

Spill Response Kits are to be maintained at the proposed development and are to be utilised by onsite staff for minor and major spills, where safe to do so.

Fire services are to be called in the event of a spill is too large to control and cannot be cleaned with a spill kit at site or it is not considered safe to do so.

5.4 Emergency evacuation

It is expected that trained staff will be able manage the evacuation of the site in an onsite fire emergency including the following:

- warn customers using PA system to not start cars and clear 15 m away from area
- if emergency escalates, evacuate all people and customers from the site. Customers are to remain offsite until the service station is declared safe by emergency services, at which time they may return to their cars

- if the fire is within the proposed building:
 - ensure everyone has evacuated
 - if safe to do so, fight fire with fire extinguisher ensuring egress route is maintained
 - do not let anyone enter store until it is declared safe by emergency services.

The facility emergency management plan shall also include a plan for evacuation of the site in a bushfire emergency. Once staff become aware of bushfire that may impact the site, the emergency management procedure should, as a minimum, include the fuel and power control measures in Section 5.2 and the evacuation of occupants from the site. It is noted that the evacuation assembly area nominated for bushfire emergencies may be different to that for onsite fire emergencies, and should be sufficiently far from the service station and the bushfire risk.

5.5 Personnel training

All occupants working at the project area must be trained in responding to and managing all emergency incidents in accordance with the facility emergency management plan for the site. A record of training must be kept up to date and debrief sessions held after all training exercises.

5.6 Bushfire suppression

The nearest DFES Career Fire and Rescue brigades are stationed at Butler and Joondalup. The brigades are expected to provide a best-case emergency suppression response time of less than 15 minutes should a bushfire threaten the project area, native vegetation, or lives and homes adjacent to the project area.

5.7 Additional measures

5.7.1 Manifest

Dangerous goods sites must maintain a current manifest and a dangerous goods site plan, to allow an appropriate response by DFES in the event of an emergency, such as a fire.

Information retained onsite should include the Emergency Plan, Dangerous Goods Manifest, Register of Dangerous Goods and Hazardous Materials, Safety Data Sheets for bulk products kept on site and dangerous goods site layout plan.

5.7.2 Ignition sources

Operators of dangerous goods sites are required to manage potential ignition sources, such as hot works and electrical equipment, within any on-site hazardous areas.

5.7.3 Placard and marking

A placard, readily visible for DFES personnel and providing visual warnings of the hazards associated with storage of diesel, will be required at the proposed tank site in accordance with *DMP Storage and handling of dangerous materials Code of Practice* (DMP 2010).

Signage and notices will also be required in accordance with AS 1940-2017, *The storage and handling of flammable and combustible liquids*.

5.7.4 Emergency information for neighbours

Neighbours adjacent to the proposed development shall be provided with a document detailing the project area emergency response actions and contact numbers.

5.8 Document review

This BRMP will be reviewed and updated after five years following endorsement, or after major fire events or changes to site conditions such as the type and amount of stored flammable goods.

5.9 Residual bushfire risk

JBS&G expects that through implementation of the management measures outlined in this BRMP, inherent bushfire risk to life and property within and surrounding the project area can be mitigated to suitable levels.

6. References

- Department of Mines and Petroleum (DMP) 2014, *Dangerous Goods Safety Guidance Note, Manifest and site plan requirements for dangerous goods sites*, Resources Safety, Department of Mines and Petroleum, Western Australia.
- Department of Mines and Petroleum (DMP) 2010, *Storage and handling of dangerous goods - code of practice* (2nd edition), Resources Safety, Department of Mines and Petroleum, Western Australia.
- Department of Fire and Emergency Services (DFES) 2015, *Guidelines for Preparing a Bushfire Risk Management Plan*, Department of Fire and Emergency Services, Western Australia.
- Department of Fire and Emergency Services (DFES) 2021, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<https://maps.slip.wa.gov.au/landgate/bushfireprone/> [Accessed 19/10/2023]
- JBS&G 2023, *Bushfire Management Plan: Lot 480 Neerabup Road, Clarkson, Development Application (Rev 0)*, JBS&G, Perth/Bunbury.
- Standards Australia and Standards New Zealand (SA & SNZ) 2018, *Australian Standard/New Zealand Standard AS/NZS ISO 31000:2018 Risk management – Principles and guidelines*, Standards Australia/Standards New Zealand, Sydney/Wellington.
- Standards Australia (SA) 2018, *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas, Version 1.4 December 2021*, Western Australian Planning Commission, Perth.

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Document Status

Report version	Rev No.	Purpose	Author	Reviewed and Approved for Issue	
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