

Bushfire Management Plan

Portion Lot 128 South Western Highway,
Byford

Project No: EP19-002(02)

**Prepared for Parsons Management Group Pty Ltd
July 2021**

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



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This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Department of Fire and Emergency Services or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959-2018 is to "prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire while the front passes" (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be lost.

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Executive Summary

Parsons Management Group Pty Ltd (the proponent) is progressing a subdivision and development application for the remaining portion of Lot 128 South Western Highway, Byford (herein referred to as 'the site'). The site is proposed to be developed for commercial and light industrial purposes, with the development application only covering a portion of the site. The remainder of Lot 128 South Western Highway, Byford is not subject to this subdivision and development application (i.e. the broader proponent landholding is subject to a separate subdivision approval (in accordance with Western Australian Planning Commission (WAPC) subdivision approval reference 157084 and 159209) and development application (which has been approved and is currently being progressed)). The proposed subdivision and development application has been prepared cognisant of these existing approvals.

The site consists of an area approximately 2.47 ha in size and is located within the Shire of Serpentine Jarrahdale. It is bounded by the remainder of the proponent's landholding to the north (which is subject to an existing development approval), South Western Highway to the east of the site, future commercial development to the south and the unconstructed Robertson Road reserve to the west of the site.

The site is currently identified as a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2019). The identification of the site within an area declared as bushfire prone necessitates that a further assessment of the determined bushfire risk affecting the site (in accordance with *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas (AS 3959)*) and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)* (WAPC 2015) and its associated *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

The purpose of SPP 3.7 and its policy intent is best summarised as preserving life and reducing the impact of bushfire on property and infrastructure through effective risk-based land use planning. Importantly, it is required by SPP 3.7 that the determining authority is to apply its consideration to the precautionary principle (clause 6.11 in SPP 3.7) and it must be satisfied that the intent of the policy measures have been met, before it issues an approval.

This Bushfire Management Plan (BMP) examines the various responses to the identified bushfire risk (following development) that will make the ultimate use of the land suitable for its intended purpose. As part of this, a bushfire attack level (BAL) assessment has been undertaken to determine the associated bushfire risk, the applicable BAL ratings (if any), and in turn the building siting and construction response that will achieve compliance with the bushfire protection criteria and satisfy the precautionary principle.

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As part of assessing the long-term bushfire risk to the site, the vegetation within the site and 150 m of the site has been classified in accordance with AS 3959. The following bushfire hazards were identified within 150 m of the site in the post-development scenario:

- Forest (Class A) vegetation, largely associated with Brickwood Reserve and private landholdings to the west of the site.
- Woodland (Class B) vegetation, associated with landholdings to the north, east and south of the site, and within the Perth – Bunbury railway reserve to the west of the site.
- Shrubland (Class C) vegetation, associated with areas of vegetation adjacent to South Western Highway to the south of the site and within the Perth – Bunbury railway reserve to the west of the site.
- Scrub (Class D) vegetation, associated with remnant vegetation within the South Western Highway road reserve to the east of the site.
- Grassland (Class G) vegetation, associated with landholdings to the east, south and west of the site, in addition to areas within the Perth – Bunbury railway reserve and the unconstructed portions of the Robertson Road reserve to the west of the site.

Overall, the outcomes of this BMP demonstrate that as development progresses, it will be possible for the intent of the bushfire protection criteria outlined in the Guidelines to be satisfied. This includes:

- **Element 1 Location:** future habitable buildings within the site will be located in a moderate bushfire hazard level area.
- **Element 2 Siting and Design:** future habitable buildings can be sited within the proposed development so that BAL-29 or less can be achieved based on the development layout and separation to external bushfire hazards through the provision of public roads. As part of staged development, the proponent will be required to maintain the undeveloped portions of the site and their broader landholdings to achieve low threat pursuant to Section 2.2.3.2 of AS 3959 until commercial development is progressed.
- **Element 3 Vehicular Access:** appropriate vehicle access can be provided, with the site having direct access to the public road network via Robertson Road which will connect to South Western Highway immediately east of the site and Orton Road to the south (when it is extended). South Western Highway is a primary regional road providing a major freight and vehicle connection within the Perth metropolitan region and south-west Western Australia. The northern portion of Robertson Road is being constructed as part of the existing Stage 1 development (as per subdivision approval WAPC# 157084) and will be extended as part of staged development within the site. Robertson Road will eventually connect to the future extension of Orton Road within the southern portion of the site.
- **Element 4 Water:** the development will be provided with a permanent and reticulated water supply to support onsite firefighting requirements.

The management/mitigation measures to be implemented through the proposed subdivision of the site, as discussed in this BMP, demonstrate that the acceptable solutions and/or intent of each element can be met. Accordingly, having regard to clause 6.11 of SPP 3.7, the precautionary principle has been satisfied. Following certification, the BAL ratings determined within this BMP can be used to support future building approval processes where required.

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Appendix A

Proposed subdivision and development plan (Urbanism 2020)

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List of Abbreviations

Table A1: Abbreviations – General terms

General terms	
AHD	Australian Height Datum
AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
EEP	Emergency Evacuation Plan
ESL	Emergency Services Levy
FDI	Fire Danger Index
FZ	Flame Zone

Table A2: Abbreviations – Organisations

Organisations	
DBCA	Department of Biodiversity Conservation and Attractions
DoW	Department of Water (now known as Department of Water and Environment Regulation)
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
OBRM	Office of Bushfire Risk Management
SES	State Emergency Services
WAPC	Western Australian Planning Commission

Table A3: Abbreviations – Legislation and policies

Legislation	
Guidelines	<i>Guidelines for Planning in Bushfire Prone Areas version 1.3 (WAPC and DFES 2017)</i>
SPP 3.7	<i>State Planning Policy 3.7 Planning in Bushfire Prone Areas (WAPC 2015)</i>

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Table A4: Abbreviations – Planning and building terms

Planning and building terms	
AS 3959	<i>Australian Standard 3959-2018 Construction of buildings in bushfire prone areas</i>
LPS	Local Planning Scheme
MRS	Metropolitan Region Scheme

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1 Introduction

1.1 Background

Parsons Management Group Pty Ltd (the proponent) is progressing the subdivision for the remainder of Lot 128 South Western Highway, Byford (herein referred to as the 'site'). The site is proposed to be subdivided and developed for commercial and light industrial purposes, as shown in the attached subdivision plan in **Appendix A**. The remainder of Lot 128 South Western Highway, Byford which is not subject to this subdivision and development application (i.e. the broader 'proponent landholding') is subject to a separate subdivision approval (in accordance with Western Australian Planning Commission (WAPC) subdivision approval reference 157084 and 159209) and development application (which has been approved and is currently being implemented). The proposed subdivision and development application applicable to the site has been prepared cognisant of the existing approvals.

The site is shown in **Figure 1** and consists of an area of approximately 2.47 ha in size and is located within the Shire of Serpentine Jarrahdale. It is bounded by the remainder of the proponent's landholding to the north (which has been subject to an existing development approval) and east, South Western Highway to the east of the site, future commercial development to the south and the Perth-Bunbury railway reserve and current unconstructed Robertson Road reserve to the west of the site.

The site is currently identified as a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2019) and is shown in **Plate 1** below. The identification of an area within a declared bushfire prone area necessitates a further assessment of the bushfire risk and suitability of the proposed development to be undertaken in accordance with *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

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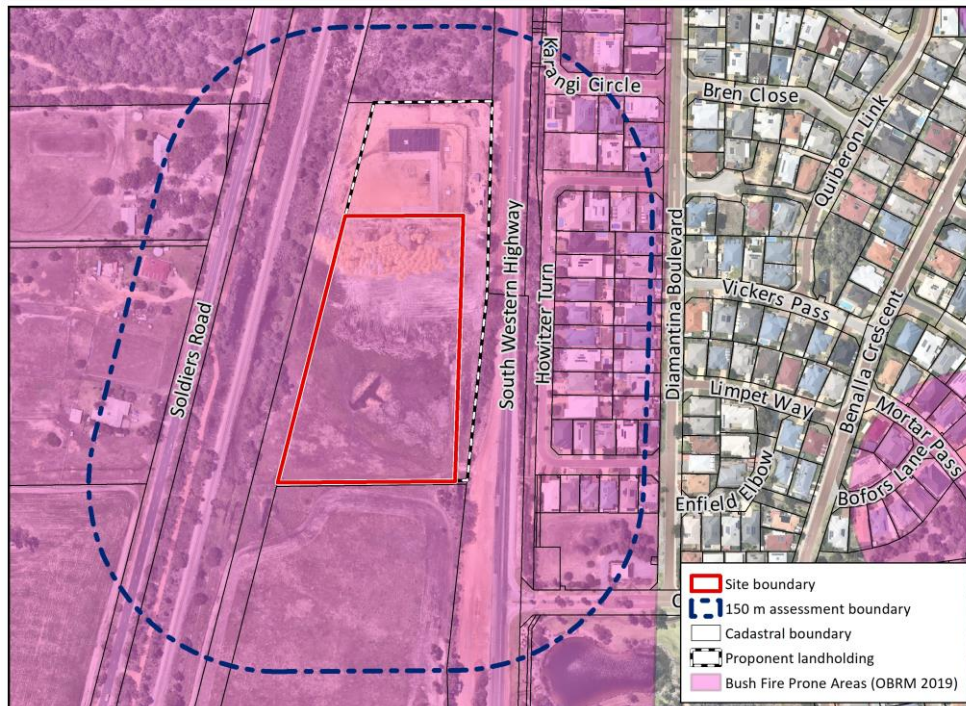


Plate 1: Areas within and surrounding the site identified as 'bushfire prone areas' (as indicated in purple) under the state-wide Map of Bush Fire Prone Areas (OBRM 2019).

1.2 Aim of this report

The aim of this BMP is to assess bushfire hazards within the site and nearby areas and ensure that the threat posed by any identified hazards can be appropriately mitigated and managed and demonstrate satisfaction of clause 6.11 of SPP 3.7 the precautionary principle. It has been prepared to support the subdivision of the site, but also considers the development application prepared for the northern portion of the site. It addresses the requirements of SPP 3.7 (WAPC 2015), the Guidelines (WAPC and DFES 2017) and *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas* (AS 3959) (Standards Australia 2018). The document provides an assessment of the general bushfire management strategies to be considered as part of the future commercial development within the site and includes:

- Overview of the proposed development (see **Section 1.4**).
- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post-development scenario (**Section 3**).
- Commentary on how future development can achieve the bushfire protection criteria outlined within the Guidelines (**Section 5**).
- An outline of the roles and responsibilities associated with implementing this BMP (see **Section 6**).

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1.3 Statutory policy and framework

The following key legislation, policies and guidelines are relevant to the preparation of a bushfire management plan:

- *Fire and Emergency Services Act 1998*
- *Bush Fires Act 1954*
- *Planning and Development Act 2005* and associated regulations
- *Building Act 2011* and associated regulations
- *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
- *Guidelines for Planning in Bushfire Prone Areas version 1.3* (WAPC and DFES 2017)
- *Australian Standard AS 3959 – 2018 Construction of buildings in bushfire prone areas* (Standards Australia 2018).

The site is located within the *Lot 1, Lot 3 and Lot 128 South Western Highway Local Structure Plan* area, with the site to be developed in accordance with the approved structure plan (Gray and Lewis 2014).

A Bushfire Management Plan was previously prepared by (Emerge Associates 2019) to support the development application for the construction and operation of a self-storage facility north of the site but within the broader proponent landholding. This area is shown as 'Lot 1' within **Appendix A**. The outcomes from this BMP have been considered as part of this assessment.

1.4 Description of the proposed development

The site is proposed to be subdivided in accordance with the subdivision plan provided in **Appendix A**. The subdivision is proposed to result in the creation of 3 lots, including:

- Lot 2, approximately 3,388 m² in size,
- Lot 3, approximately 3,907 m² in size, and
- The remainder of Lot 128, approximately 1.74 ha in size (including an area proposed for the future extension of Orton Road).

Appendix A includes the proposed development layout for Lot 2 and Lot 3. Development within the lots is proposed to include:

- Lot 2 is proposed to support the construction and operation of a panel and paint facility, which will include:
 - Light industrial/automotive repair, approximately 749 m² in size
 - Office space, approximately 56 m² in size
 - Warehouse, approximately 452 m² in size
 - Storage area, approximately 61 m² in size
 - Approximately 371 m² of soft landscaping, and
 - 47 car parks.

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- Lot 3 is proposed to support mixed-use industrial units, including:
 - Light industry/showroom, approximately 584 m² in size
 - Light industry, approximately 458 m² in size
 - Warehouse, approximately 618 m² in size
 - 36 car parks, and
 - Landscaped areas.

The entire site is zoned 'Urban' under the Metropolitan Region Scheme (MRS), as shown in **Plate 2**, and 'Service commercial' under the Shire of Serpentine Jarrahdale Local Planning Scheme No. 3 (LPS 3).

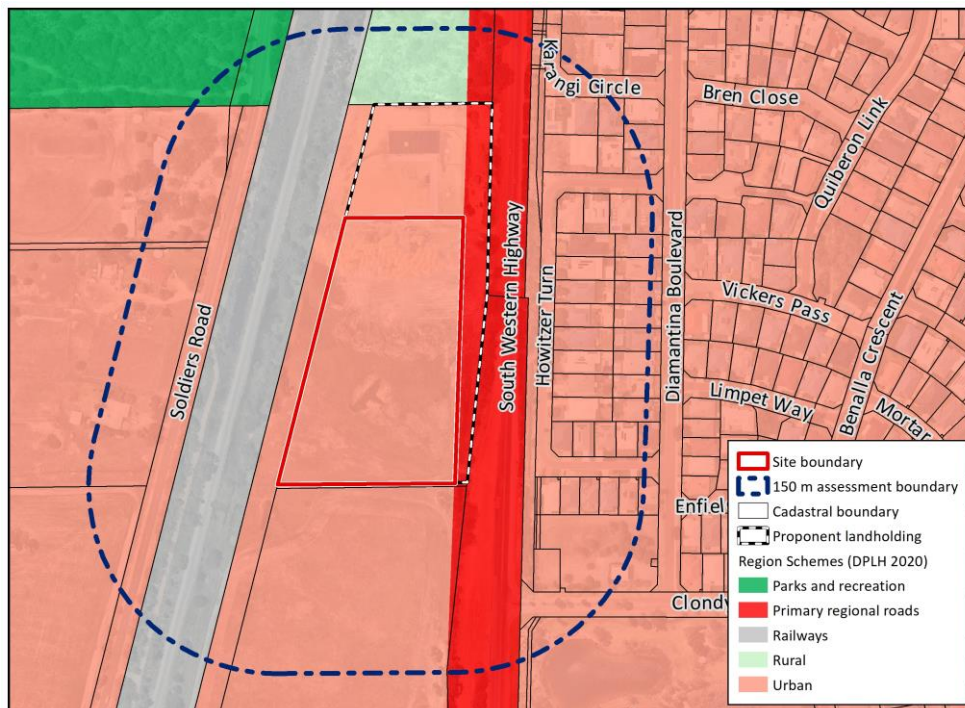


Plate 2: Existing MRS zoning for the site and surrounds.

1.5 Description of land characteristics

The natural topographical contours indicate that the site has an elevation of approximately 58 m Australian Height Datum (m AHD) along the eastern boundary of the site dropping to 56 m AHD along the western boundary of the site, as shown in **Figure 1**.

Based on a review of publicly available historic aerial imagery (Landgate 2020), the majority of the site was historically cleared of native vegetation prior to 1953 to support agricultural activities, with scattered paddock trees remaining within the northern portion of the site. Since 1953, sporadic patches of vegetation regrew throughout the site. In 2020 as part of progressing the development of 'Lot 1', the regrown vegetation was cleared and the site is now composed of areas of bare mineral earth and paddock grasses.

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The land uses surrounding the site (within 150 m) include:

- Areas of bare mineral earth associated with the proponent's landholding immediately to the north, and a public reserve further to the north supporting the retention of remnant vegetation.
- South Western Highway to the east, and existing residential development further to the east.
- Vacant land zoned for future commercial development to the south.
- Robertson Road reserve to the west and the Perth-Bunbury railway further to the west.

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2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by Department of Planning, Lands and Heritage (2018), this BMP has considered whether there are any environmental values that may restrict the implementation of routine bushfire protection measures. A review of publicly available databases, has been undertaken as well as a review site specific information (where available) with particular reference to the Shared Location Information Platform (SLIP) databases. A summary of the search results has been provided in **Table 1**.

The site has previously been cleared of all remnant vegetation, with the site composed of areas of bare mineral earth and paddock grasses.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases)

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe the value that may be impacted
Conservation category wetlands and buffer (Swan Coastal Plain (DBCA-019))	No	No wetland values that require specific protection have been identified within the site. The southern portion of the site is identified as a multiple use wetland (MUW) (Unique Feature Identifier (UFI) #15382). A conservation category wetland (UFI #13010) is mapped approximately 40 m to the west of the site. No buffers for these wetlands need to be accommodated within the site.
RAMSAR wetlands (DBCA-010)	No	Not applicable. No RAMSAR sites are located within or nearby to the site.
Threatened and priority flora (Landform Research 2010)	No	A flora and vegetation assessment (Landform Research 2010) undertaken to support the structure plan did not identify any threatened or priority fauna within the site. Since the survey was completed the site has been cleared of remnant vegetation and now consists of areas of bare mineral earth and paddock grasses.
Threatened and priority fauna (DBCA-037)	No	It is highly unlikely that any threatened or priority fauna utilise the site, given the site consists of areas of bare mineral earth and paddock grasses.
Threatened ecological communities (Landform Research 2010)	No	The site consists of areas of bare mineral earth and paddock grasses and is not considered to be a TEC.
Department of Biodiversity Conservation and Attractions (DBCA) controlled lands or waters (DBCA-011)	No	Not applicable. No DBCA controlled lands or water exist within or in close proximity to the site.
Bush Forever areas (DOP-071)	No	Bush Forever Site 350 is located adjacent to the western boundary of the site and to the north of the site, and is associated with the vegetated portions of the public open space to the north and the Perth - Bunbury railway reserve to the west. Robertson Road reserve is identified as part of Bush Forever Site 350, however it is largely cleared of native vegetation, being composed mostly of paddock grasses with some scattered trees.

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Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases) (continued)

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe the value that may be impacted
Clearing regulations – Environmentally Sensitive Areas (DWER-046)	Yes	While the site is identified in an environmentally sensitive area (ESA), it is likely that the designation of the site as an ESA would be associated with a buffer applied to TECs located in the Perth-Bunbury railway reserve, to the west of the site. As no native vegetation is present within the site, the ESA is not a relevant consideration.
Conservation Covenants Western Australia (DPIRD-023)	No	Not applicable.
Aboriginal heritage (DAA-001)	No	Not applicable. No registered Aboriginal heritage sites were identified within the site. One registered Aboriginal heritage site is located approximately 37 m to the south-east of the site (Site ID 16096, Byford 08) and is associated with artefacts/scatter. In addition, registered Aboriginal heritage Site ID 16097, Byford 09 is located approximately 160 m to the north-east of the site.
Non-indigenous heritage (SHO-003)	No	Not applicable. No non-indigenous heritage sites were identified within or nearby to the site based on the publicly available mapping.

2.1 Native vegetation – modification and clearing

While the site is shown as an environmentally sensitive area (ESA), this is likely to be related to a 500 m buffer that is typically applied to known TECs, with TECs known to occur within the Perth-Bunbury railway reserve to the west of the site. Where an ESA is present, clearing exemptions pursuant to the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 do not apply. As no native vegetation is present within the site, the ESA is not a relevant consideration.

2.2 Revegetation and landscape plans

No revegetation is proposed within the site or the broader proponent landholding as part of the proposed future development.

Portions of the site will be landscaped as part implementing the commercial development, and will include Robertson Road and the portion of land adjacent to South Western Highway. The landscaped areas within the site and the broader proponent landholding (as well as within Robertson Road reserve) will be designed and maintained to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959. The management of the landscaped areas will be the responsibility of the proponent, with ongoing management likely to include:

- Regular mowing/slashing of grass/turf to less than 150 mm in height (where present).
- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate).

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- Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.

Following a minimum 2 year developer maintenance period, the ongoing maintenance of the Robertson Road reserve will be the responsibility of the Shire of Serpentine Jarrahdale.

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3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered in the specific context of the Guidelines (WAPC and DFES 2017) and AS 3959. The Guidelines require the identification of the bushfire risk (using AS 3959) out to 150 m from the development site, but for determining the likely bushfire impacts upon a building, a distance of 100 m is used. The objective of AS 3959 is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack on a building or object. It also prescribes simple national construction responses that can resist the determined radiant heat level at a given distance from the fire and are based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

The construction requirements detailed in AS 3959 that may be indicated as part of the BAL assessment will only apply to new Class 1, 2, 3 and 10a buildings to be constructed as part of the development of the site and that are designated as bushfire prone within the state-wide *Map of Bush Fire Prone Areas* (as updated).

Two separate methods are outlined in AS 3959 for determining the impact of bushfire on dwellings and have been outlined below:

- **Method 1**, outlined in Section 2 and Appendix A of AS 3959, provides a basic assessment of radiant heat flux levels at various distances from classified vegetation (up to 100 m). This method assumes standard fuel loads for classified vegetation as outlined in AS 3959 and considers the effective slope beneath vegetation. This method can be used to determine appropriate setbacks to dwellings to achieve different levels of radiant heat exposure (i.e. BAL-12.5 to BAL-FZ).
- **Method 2**, outlined in Appendix B of AS 3959, provides access to the formula used to derive the Method 1 values. Where justified, it enables the inputs used in Method 1 to be varied, to reflect true site conditions to provide a site-specific assessment of the radiant heat level at any given distance from the fire.

Not all vegetation is a classified bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard is identified as a low threat under Section 2.2.3.2 of AS 3959. Low threat vegetation includes the following:

- a) Any vegetation that is more than 100 m from the site.
- b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other, or of other areas of vegetation being classified.
- d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

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- f) Vegetation regarded as a low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and wind breaks.

3.1 Bushfire attack level (BAL) assessment

In accordance with Appendix Five of the Guidelines, a method 1 BAL assessment has been undertaken to support the subdivision of the site, in order to determine the BAL ratings potentially applicable to the habitable buildings: based on the vegetation classification and effective slope. The BAL ratings are illustrated across the site in the BAL contour plan.

3.1.1 Assessment inputs

Assessing bushfire hazards takes into account the classes of vegetation within the site and surrounding area for a minimum of 100 m, in accordance with AS 3959. The assignment of vegetation classifications is based on an assessment of vegetation structure, which includes consideration of the various fuel layers of different vegetation types. For example, fuel layers in a typical forest environment can be broken-down into five segments as illustrated in **Plate 3** below. These defined fuel layers are considered when determining the classification of vegetation and associated bushfire hazard levels.

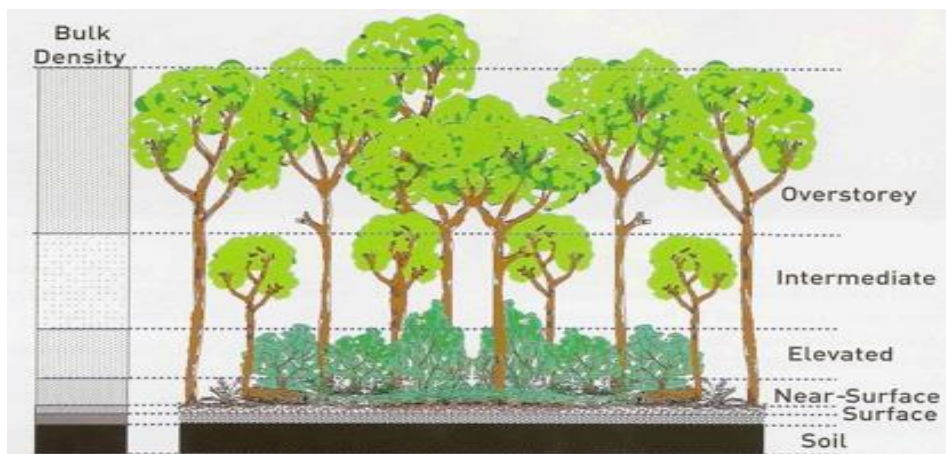


Plate 3: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

An assessment of existing vegetation within the site and surrounding 150 m and the effective slope was undertaken on the 12th November 2020, following the method detailed in Section 2.2 of AS 3959 and the Guidelines.

Table 2 below outlines:

- The pre-development AS 3959 vegetation classifications (and associated photo locations), which are also shown in **Figure 2**. Additional photos not shown in **Table 2** are provided in **Appendix B**.

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- The post-development AS 3959 vegetation classifications, which are also shown in **Figure 3**.
- The effective slope for each area of classified vegetation present in the post-development scenario, which is also shown in **Figure 4**.

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Table 2: Vegetation classification, effective slope and future management

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
1	<p>Forest vegetation has been identified to the west of Soldiers Road, within Brickwood Reserve and private landholdings.</p> <p>These areas of vegetation are not managed and are associated with multiple fuel layers, including near-surface, understorey, elevated and overstorey.</p> <p>AS 3959 classification (Figure 2): Forest (Class A)</p> <p>Photo points: 1, 2, 3, 4</p>	 <p><i>Photo location 1: forest vegetation within Brickwood Reserve to the west of the site, looking west.</i></p>  <p><i>Photo location 3: forest vegetation with multiple fuel layers within Brickwood Reserve, looking west.</i></p>	 <p><i>Photo location 2: forest vegetation to the west of the site, looking west.</i></p>  <p><i>Photo location 4: forest vegetation within Brickwood Reserve, looking north-west.</i></p>	<p>1</p> <p>The forest vegetation outside the site is assumed to remain in the same condition as the pre-development assessment in the long-term and will therefore remain a bushfire hazard.</p> <p>AS 3959 classification (Figure 3): Forest (Class A)</p> <p>Effective slope (Figure 4): Flat/upslope</p>

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Table 2: Vegetation classification, effective slope and future management (continued)





Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
2 - 6	<p>Patches of woodland vegetation have been identified outside of the site, associated with areas of remnant vegetation within:</p> <ul style="list-style-type: none"> • Public open space/reserve to the north of the proponent’s landholding (Plot 2). • Perth – Bunbury railway reserve located to the west of the site (Plot 3). • Remnant vegetation within Soldiers Road reserve to the west of the site (Plot 4). • Private landholdings to the south of the site (Plot 5). • Private landholdings to the east of the site (Plot 6). <p>These areas of vegetation have been highly modified in the past and contains overstorey vegetation with some surface/ near-surface fuels.</p> <p>AS 3959 classification (Figure 2): Woodland (Class B)</p> <p>Photo points: 7, 17, 19, 29, 36, 47, 49, 50</p>	 <p><i>Photo location 7: woodland vegetation within the railway reserve (Plot 3), looking south-west.</i></p>  <p><i>Photo location 49: woodland vegetation to the north of the site (Plot 2), looking west.</i></p>	 <p><i>Photo location 29: woodland vegetation within landholdings to the south of the site (Plot 5), looking north.</i></p>  <p><i>Photo location 50: woodland vegetation within the landholdings to the north of the site (Plot 2), looking north.</i></p>	<p>2 - 6</p> <p>The woodland vegetation outside the site is assumed to remain in the same condition as the pre-development assessment in the long-term and will therefore remain a bushfire hazard. It is possible that woodland vegetation to the south of the site (Plot 5) may be removed or modified to achieve low threat in the long-term (as part of future commercial development), however as the timing for this development is unknown, it has been assumed to remain a hazard.</p> <p>AS 3959 classification (Figure 3): Woodland (Class B)</p> <p>Effective slope (Figure 4): Flat/upslope</p>

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
7, 8	<p>Shrubland vegetation has been identified:</p> <ul style="list-style-type: none"> To the west of the site, associated with the Perth – Bunbury railway reserve (Plot 7). To the east of the site, within private landholdings (Plot 8). <p>The vegetation is associated with a mix of species, including scattered <i>Xanthorrhoea preissii</i> and other species less than 2 m in height. This appears to be a steady-state vegetation structure, and is typical of some of the clay pan vegetation communities found on this part of the Swan Coastal Plain.</p> <p>AS 3959 classification (Figure 2): Shrubland (Class C)</p> <p>Photo points: 5, 7, 9, 11, 14, 27</p>	 <p>Photo location 5: shrubland vegetation within the railway reserve (Plot 7), looking south.</p>  <p>Photo location 11: shrubland vegetation (Plot 7), looking south-east.</p>	 <p>Photo location 7: shrubland vegetation within the railway reserve (Plot 7), looking south-west.</p>  <p>Photo location 27: strip of shrubland vegetation (right side of photo) associated with Plot 8, looking south.</p>	<p>7, 8</p> <p>The shrubland vegetation outside the site is assumed to remain in the same condition as the pre-development assessment in the long-term and will therefore remain a bushfire hazard.</p> <p>AS 3959 classification (Figure 3): Shrubland (Class C)</p> <p>Effective slope (Figure 4): Flat/upslope</p>

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
9	An area of scrub vegetation has been identified within the eastern portion of the proponent landholding, extending into the South Western Highway road reserve. This vegetation appears to be less than 6 m in height. AS 3959 classification (Figure 2): Scrub (Class D) Photo points: 38, 39, 40, 41	 <p>Photo location 38: scrub vegetation along the eastern boundary of the site, looking north-east.</p>	 <p>Photo location 39: scrub vegetation, less than 6 m in height, looking north-west.</p>	9 The scrub vegetation within the South Western Highway road reserve is assumed to remain in the same condition as the pre-development assessment in the long-term and will therefore remain a bushfire hazard. AS 3959 classification (Figure 3): Scrub (Class D) Effective slope (Figure 4): Flat/upslope
		 <p>Photo location 40: scrub vegetation, looking north-east.</p>	 <p>Photo location 41: scrub vegetation, looking south-west.</p>	

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
10	<p>A strip of scrub vegetation has been identified within the road reserve to the east of the site, associated with South Western Highway and Howitzer Turn.</p> <p>These areas of scrub are associated with vegetation that is between 2m and 6 m in height and does not appear to be subject to regular maintenance. Due to this strip of vegetation being within 20 m of other classified vegetation, it cannot be excluded as a hazard.</p> <p>AS 3959 classification (Figure 2): Scrub (Class D)</p> <p>Photo points: 37, 43, 44, 48</p>	 <p><i>Photo location 37: scrub vegetation within the road reserve to the east, looking north.</i></p>  <p><i>Photo location 44: scrub vegetation, looking north-west.</i></p>	 <p><i>Photo location 43: scrub vegetation, looking north-west.</i></p>  <p><i>Photo location 48: scrub vegetation, looking south.</i></p>	<p>10</p> <p>The strip of scrub vegetation to the east (Plot 10) of the site is assumed to remain in the same condition as the pre-development assessment in the long-term and will therefore remain a permanent bushfire hazard.</p> <p>AS 3959 classification (Figure 3): Scrub (Class D)</p> <p>Effective slope (Figure 4): Flat/upslope</p>

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Table 2: Vegetation classification, effective slope and future management (continued)





Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
11, 12	<p>Areas of grassland vegetation have been identified within the site and the portion of Robertson Road reserve adjacent to the western boundary of the site. These areas appear to be subject to some management (in the form of slashing), however it is unclear how regularly this occurs and therefore has been identified as a bushfire hazard.</p> <p>AS 3959 classification (Figure 2): Grassland (Class G)</p> <p>Photo points: 18, 20, 21, 22, 24, 26</p>	 <p><i>Photo location 18: grassland vegetation within Robertson Road reserve, looking south.</i></p>  <p><i>Photo location 21: grassland vegetation within the site, looking south.</i></p>	 <p><i>Photo location 20: grassland vegetation within the central portion of the site, looking east.</i></p>  <p><i>Photo location 22: grassland vegetation within the central portion of the site, looking south.</i></p>	<p>17</p> <p>The grassland areas within the site and the portion of Robertson Road adjacent to the site will be converted to hardstand areas in the form of buildings, carparks and roads and are therefore considered to be low threat in accordance with exclusion clause 2.2.3.2 (e). It is noted that some of these areas may contain managed grass/garden areas/verges in the future, however, for ease of reference have been excluded as non-vegetated on the basis that these will form part of the development.</p> <p>As part of staged development (particularly based on the development application), areas within the site and Robertson Road reserve not subject to development will need to be maintained to a low threat standard in accordance with Section 2.2.3 of AS 3959. This will include, as a minimum, regular slashing/mowing of grass fuels. The area likely to require temporary management is shown in Figure 3.</p> <p>AS 3959 classification (Figure 3): Non-vegetated (exclusion clause 2.2.3.2(e))</p> <p>Effective slope (Figure 4): Not applicable</p>

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
13 - 16	<p>Areas of grassland vegetation have been identified outside the site within:</p> <ul style="list-style-type: none"> The Perth – Bunbury railway reserve to the west (Plot 13). Private landholdings to the west of the Perth-Bunbury railway reserve and Soldiers Road (Plot 14). Landholdings to the south and within South Western Highway to the east (Plot 15). Landholdings to the east, which appears to be an undeveloped parcel of land associated with existing urban development (Plot 16). <p>Some areas of the identified grassland vegetation (Plot 14) appear to be subject to some maintenance (i.e. mowing/ slashing), while other areas appear to have no/only limited maintenance. All areas have been classed as a hazard.</p> <p>AS 3959 classification (Figure 2): Grassland (Class G)</p> <p>Photo points: 12, 16, 25, 30, 35, 51</p>	 <p><i>Photo location 12: grassland vegetation within Soldiers Road reserve and landholdings to the west of the site (Plot 14), looking west.</i></p>  <p><i>Photo location 25: grassland vegetation within landholdings to the south of the site (Plot 15), looking south.</i></p>	 <p><i>Photo location 16: grassland vegetation within the Perth – Bunbury railway reserve (Plot 13), looking south-east.</i></p>  <p><i>Photo location 30: grassland vegetation within landholdings to the south of the site (Plot 15), looking west.</i></p>	<p>13 - 16</p> <p>It is assumed that the grassland vegetation outside of the site will remain in the same condition as the pre-development assessment and be a bushfire hazard to future development.</p> <p>AS 3959 classification (Figure 3): Grassland (Class G)</p> <p>Effective slope (Figure 4): Flat/upslope</p>

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
17	<p>Non-vegetated areas such as roads, access tracks, pathways, railway lines, existing buildings, and areas of mineral earth (i.e. associated with current construction activities in the proponent's landholding) within and surrounding the site have been excluded in accordance with clause 2.2.3.2(e) of AS 3959.</p> <p>AS 3959 classification (Figure 2): Non-vegetated (exclusion clause 2.2.3.2(e))</p> <p>Photo points: 8, 10, 13, 15, 23, 28, 42, 45, 46, 53</p>	 <p><i>Photo location 8: cleared areas within the proponent's landholding, looking east.</i></p>  <p><i>Photo location 15: Perth – Bunbury railway line to the west of the site, looking south.</i></p>	 <p><i>Photo location 13: Soldiers Road to the west of the site, looking north.</i></p>  <p><i>Photo location 42: existing residential development to the east of the site, looking east.</i></p>	<p>17</p> <p>The existing non-vegetated areas will remain in this state, but will be converted to hardstand areas in the form of buildings, driveways and roads and existing non-vegetated areas will therefore continue to be low threat in accordance with (exclusion clause 2.2.3.2(e)). This includes Robertson Road reserve, which will be constructed as part of the development. It is noted that some of these areas may contain managed grass, garden areas or verges in the future (as development is completed), however for ease of reference have been excluded as non-vegetated on the basis that these will form part of developed lots and road reserves.</p> <p>Existing non-vegetated areas outside the site are assumed to remain the same in the post-development scenario, with existing land uses and maintenance regimes to continue.</p> <p>AS 3959 classification (Figure 3): Non-vegetated (exclusion clause 2.2.3.2(e))</p> <p>Effective slope (Figure 4): Not applicable</p>

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Table 2: Vegetation classification, effective slope and future management (continued)

Pre-development (see Figure 2)			Post development (see Figure 3 and Figure 4)	
Plot no.	AS 3959 classification	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
18	<p>Surrounding the site, areas of low threat vegetation have been identified and are largely associated with well managed public open space to the south-east of the site.</p> <p>AS 3959 classification (Figure 2): Low threat vegetation (exclusion clause 2.2.3.2(f))</p> <p>Photo points: 31, 32, 33, 34</p>	 <p><i>Photo location 31: managed garden beds to the south-east of the site, looking south.</i></p>  <p><i>Photo location 33: public open space to the south-east of the site, looking south.</i></p>	 <p><i>Photo location 32: public open space with irrigated and mown grass, looking east.</i></p>  <p><i>Photo location 34: managed road verge associated with Clondyke Drive, looking east.</i></p>	<p>18</p> <p>The maintenance regimes for all existing low-threat vegetation surrounding the site is assumed to continue in the long-term based on current land uses and management arrangements, and also the requirements of the Shire of Serpentine Jarrahdale fire control notice.</p> <p>AS 3959 classification (Figure 3): Low threat vegetation (exclusion clause 2.2.3.2(f))</p> <p>Effective slope (Figure 4): Not applicable</p>

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3.1.1.1 Post development assumptions

The BAL assessment, to determine the predicated BAL ratings applicable to the site, has assumed the following:

- **Designated FDI:** 80
- **Flame temperature:** 1090 K
- **Vegetation classification:** forest (Class A), woodland (Class B), shrubland (Class C), scrub (Class D) and grassland (Class G) vegetation identified within the post-development scenario, see **Figure 3**.
- **Effective slope beneath classified vegetation:** flat/upslope (see **Figure 4**)
- **Setback distances:** as per Table 2.5 in AS 3959 with the relevant distances used to inform the BAL contour plan summarised in **Table 3** with the BAL contour provided in **Figure 5**.

In addition to the above, the following key assumptions have informed this assessment:

- Any classified vegetation associated with proposed landscaped areas within the site (including Robertson Road reserve) will be removed or modified to achieve low threat in accordance with Section 2.2.3.2 of AS 3959. Where applicable, management of low threat areas will be similar to typical public open space requirements and may include (but is not limited to):
 - Regular mowing/slashing of grass/turf to less than 100 mm in height (where present).
 - Irrigation of grass and garden beds (where required).
 - Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
 - Low pruning of trees (branches below 2 m in height removed where appropriate).
 - Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.
- Areas identified as 'temporary hazards to be managed by the proponent' within **Figure 3** will be maintained by the proponent to an asset protection zone (APZ) standard to achieve low threat in accordance with Section 2.2.3.2 of AS 3959, until commercial development is progressed within this area (including the construction of Robertson Road). The APZ will be designed and maintained in accordance with the principles of Element 2, Schedule 1 of Appendix Four of the Guidelines (WAPC and DFES 2017), with an excerpt of the requirements provided in **Appendix C**. Given the characteristics of this area (cleared paddocks), management of this area will include (but is not limited to):
 - Regular mowing/slashing of grass to less than 100 mm in height (where present).
 - Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
 - Application/replacement of ground/surface covers such as mulch or non-flammable materials as required/where applicable.
- Areas of low threat vegetation outside of the site (and not under the proponent's control) will continue to be managed and/or considered to achieve low threat (in accordance with Section 2.2.3.2 of AS 3959) based on the existing maintenance regimes, and/or as per the Shire of Serpentine Jarrahdale's fire control notice.
- Classified vegetation that has been identified outside of the proponent's landholdings has been assumed to remain in its current state (unless stated otherwise), and will, therefore, remain a bushfire hazard to development within the site.

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3.1.2 Assessment outputs

The BAL assessment completed for the site indicates that a BAL rating of BAL-29 or less can be achieved at future habitable buildings based on the proposed subdivision layout, with commercial and industrial development typical including hardstand and carpark areas that can provide separation. The development application that has been prepared for Lot 2 and Lot 3 demonstrates that buildings can be located in an area subject to BAL-19 or less, as shown in **Figure 5**. The majority of the site is likely to be subject to a BAL rating of BAL-12.5.

Table 3 provides a summary of the setback distances necessary from classified vegetation to achieve the indicated BAL ratings, with the BAL Contour Plan (**Figure 5**) being a visual representation of these distances. The setback distances are based on the post-development classified vegetation (**Figure 3**), effective slope (**Figure 4**) and are taken from Table 2.5 of AS 3959.

Table 3: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment

Post development plot number (see Figure 3)	Vegetation classification (see Figure 3)	Effective slope (see Figure 4)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating (see Figure 5)
Plot 1	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 2 - 6	Woodland (Class B)	Flat/upslope	< 10 m	BAL-FZ
			10 - < 14 m	BAL-40
			14 - < 20 m	BAL-29
			20 - < 29 m	BAL-19
			29 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 7, 8	Shrubland (Class C)	Flat/upslope	< 7 m	BAL-FZ
			7 - < 9 m	BAL-40
			9 - < 13 m	BAL-29
			13 - < 19 m	BAL-19
			19 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW

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Table 3: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment (continued)

Post development plot number (see Figure 3)	Vegetation classification (see Figure 3)	Effective slope (see Figure 4)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating (see Figure 5)
Plot 9, 10	Scrub (Class D)	Flat/upslope	< 10 m	BAL-FZ
			10 - < 13 m	BAL-40
			13 - < 19 m	BAL-29
			19 - < 27 m	BAL-19
			27 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW
Plot 13 – 16	Grassland (Class G)	Flat/upslope	< 6 m	BAL-FZ
			6 - < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

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4 Identification of Bushfire Hazard Issues

From a bushfire hazard management perspective, the key issues that are likely to require management and/or consideration as part of future development within the site include:

- Provision of appropriate separation distances from temporary and permanent bushfire hazards surrounding the site to ensure a BAL rating of BAL-29 or less can be achieved at the future habitable buildings.
- Ensuring that the southern portion of the site is managed as an asset protection zone to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959 on an ongoing basis, until commercial development progresses within this area.
- Ensuring that any landscaped areas, including road reserves, that are developed as part of this subdivision are appropriately designed and managed to achieve a low threat standard in accordance with AS 3959.
- Provision of appropriate vehicular access to ensure that egress to at least two different destinations will be available to future workers/visitors and emergency personnel, including connection to South Western Highway and the future extension of Orton Road. As part of staged development, provision will need to be made for temporary cul-de-sacs/turn-around areas along Robertson Road that can support a type 3.4 fire appliance. A temporary emergency access way may be required, depending upon staging of development and timing of Orton Road.
- Provision of appropriate water supply and associated fire-fighting infrastructure.

These issues are considered further in **Section 5**.

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5 Assessment Against the Bushfire Protection Criteria

This BMP provides an outline of the mitigation strategies that will ensure that as development progresses within the site, an acceptable solution and/or performance-based system of control can be adopted for each of the bushfire protection criteria detailed within Appendix Four of the Guidelines (WAPC and DFES 2017). The bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

- Element 1: Location of the development
- Element 2: Siting and design of the development
- Element 3: Vehicular access
- Element 4: Water supply.

As part of future development, the intent of the bushfire protection criteria can be satisfied through an acceptable solution. A summary of how this can be achieved and an associated compliance statement for each has been provided in **Table 4**.

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Table 4: Summary of bushfire protection criteria and compliance statement

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement
		Acceptable solution	Performance principle		
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.	A1.1 Development location Yes.	N/A	<p>The developable land¹ will be a moderate bushfire hazard level on completion. The subdivision layout demonstrates that 'developable land' is available and can achieve a BAL rating of BAL-29 or less based on the proposed separation to hazards outside the proponent's landholding. This is achieved through the location of the public road network and the design and ongoing management of landscape areas within the proponents landholding and Robertson Road. As part of staged development (i.e. see development application in Appendix A and proposed layout), the proponent will maintain temporary grassland hazards within the undeveloped portion of the site and Robertson Road to achieve low threat as per APZ standards outlined within Appendix C. This is discussed further below.</p> <p>The proposed development is, therefore, able to satisfy the acceptable solution.</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 1: Location. Future habitable buildings within the site can be located in an area subject to BAL-29 or less. The development application for Lot 2 and Lot 3 and shown in Figure 5 demonstrates this.

¹ Position Statement: Planning in bushfire prone areas - Demonstrating Elements 1: Location and Element 2: Siting and design (DPLH 2019) has outlined that 'developable land' is "land that can accommodate a habitable dwelling and would not generally include areas of BAL-40 and/or BAL-FZ, areas within the local government setback and areas subject to environmental constraints".

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Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement
		Acceptable solution	Performance principle		
Element 2: Siting and design	To ensure the siting and design of development minimises the level of bushfire impact.	A2.1 Asset Protection Zone Yes.	N/A	<p>Asset protection zones (APZ) around buildings are an important bushfire protection measure influencing the safety of people and property. The APZ is a low fuel area immediately surrounding a building and can include non-flammable features such as irrigated landscapes, gardens, driveways, public roads and managed public open space.</p> <p>The bushfire hazards in the post-development scenario that are relevant to the site are shown in Figure 3. These include areas of forest, woodland, shrubland, scrub and grassland vegetation located outside the proponent's landholding.</p> <p>The subdivision provides sufficient area for habitable buildings to be located to achieve a BAL rating of BAL-29 or less, as demonstrated by the BAL contour plan (see Figure 5) and the site being largely subject to BAL-12.5. Separation from bushfire hazards can be accommodated through the local road network (i.e. construction of Robertson Road to the west of the site), appropriate design and management of landscaped areas and management of temporary vegetation that will be present due to staging of development. The areas to be managed to an APZ standard on an ongoing basis or as part of staged development is shown on Figure 6.</p> <p>The development layout for the first stages of development within the site (i.e. considered as part of the concurrent development application, with the layout included in Appendix A) demonstrates how habitable buildings associated with commercial/light industrial development can be designed to ensure hardstand, carparking and landscape areas are located to provide separation to bushfire hazards.</p> <p>Overall, the acceptable solution can be satisfied for the subdivision and development application. If located within a designated bushfire prone area, any Class 1, 2, 3 and 10a buildings, will need to satisfy construction standards in accordance with AS 3959 and the determined BAL rating.</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 2: Siting and design. Future built form will be able to achieve a BAL rating of BAL-29 or less based on the location of public roads, and an asset protection zone.

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Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement																																																
		Acceptable solution	Performance principle																																																		
Element 3: Vehicular access	To ensure vehicular access serving a subdivision/ development is available and safe during a bushfire event.	A3.1 Two access routes		<p>The site will have direct access to the public/local road network, with connections to Robertson Road to the west of the site. Robertson Road will connect directly to South Western Highway to the east of the site and the future Orton Road extension (to be progressed in accordance with broader structure planning for the area) to the south. This is shown in Figure 6. South Western Highway is a primary regional road providing a major freight and vehicle connection within the Perth metropolitan region and south-west Western Australia, providing egress to the north and south and connections to the broader road network.</p> <p>The northern portion of Robertson Road is currently being constructed as part of the existing Stage 1 development and will be extended as part of staged development within the site. As outlined, Robertson Road will eventually connect to the future extension of Orton Road within the southern portion of the site. Orton Road, once constructed it will provide egress to the east (connecting to South Western Highway) and to the west (connecting to Soldiers Road and future urban development).</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 3: Vehicular access. The proposed subdivision (and development application) supports direct access to the public/local road network, and when fully constructed it will enable egress to at least two different destinations.																																																
		Yes	N/A																																																		
		A3.2 Public road		<p>Existing or proposed roads surrounding the site, including Robertson Road adjacent to the western boundary of the site, can and will comply with the minimum standards outlined in Appendix Four of the Guidelines (WAPC and DFES 2017) and includes a minimum 6 m-wide trafficable surface. An excerpt of the requirements (from Table 6 of the Guidelines) has been provided below.</p> <p><i>Excerpt of Table 6 from The Guidelines (WAPC & DFES 2017)</i></p> <table border="1"> <thead> <tr> <th>TECHNICAL REQUIREMENTS</th> <th>1 Public road</th> <th>2 Cul-de-sac</th> <th>3 Private driveway</th> <th>4 Emergency access way</th> <th>5 Fire service access routes</th> </tr> </thead> <tbody> <tr> <td>Minimum trafficable surface (m)</td> <td>6*</td> <td>6</td> <td>4</td> <td>6*</td> <td>6*</td> </tr> <tr> <td>Horizontal clearance (m)</td> <td>6</td> <td>6</td> <td>6</td> <td>6</td> <td>6</td> </tr> <tr> <td>Vertical clearance (m)</td> <td>4.5</td> <td>N/A</td> <td>4.5</td> <td>4.5</td> <td>4.5</td> </tr> <tr> <td>Maximum grade <50 metres</td> <td>1 in 10</td> <td>1 in 10</td> <td>1 in 10</td> <td>1 in 10</td> <td>1 in 10</td> </tr> <tr> <td>Minimum weight capacity (t)</td> <td>15</td> <td>15</td> <td>15</td> <td>15</td> <td>15</td> </tr> <tr> <td>Maximum crossfall</td> <td>1 in 33</td> <td>1 in 33</td> <td>1 in 33</td> <td>1 in 33</td> <td>1 in 33</td> </tr> <tr> <td>Curves minimum inner radius (m)</td> <td>8.5</td> <td>8.5</td> <td>8.5</td> <td>8.5</td> <td>8.5</td> </tr> </tbody> </table> <p>*Refer to E3.2 Public roads: Trafficable surface</p>	TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes	Minimum trafficable surface (m)	6*	6	4	6*	6*	Horizontal clearance (m)	6	6	6	6	6	Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5	Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10	Minimum weight capacity (t)	15	15	15	15	15	Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33	Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5	
		TECHNICAL REQUIREMENTS	1 Public road		2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes																																													
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Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5																																																
Yes	N/A																																																				

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement
		Acceptable solution	Performance principle		
Element 3: Vehicular access (continued from above)	Continued from above.	A3.3 Cul-de-sac (including dead-end-road)		As part of staged development of the site, temporary cul-de-sacs and/or turn-around areas will be required along Robertson Road until the permanent road network (including connection to Orton Road) is constructed. Based on the development application, the location a proposed temporary turn-around area is shown in Figure 6 . As outlined a part of A 3.1, Robertson Road will connect directly to South Western Highway, which provides egress to the north and south and connections to the broader public road network. The temporary turn-around area should be designed and maintained in accordance with Appendix Four of the Guidelines, and in particular should have a minimum 17.5 m diameter head (or other suitable turning arrangement agreed with the Shire of Serpentine-Jarrahdale).	Continued from above.
		Yes (temporary)	N/A		
		A3.4 Battle-axe		Not applicable. No battle-axe properties are proposed as part of the development within the site.	
		N/A	N/A		
		A3.5 Private driveway longer than 50 m		Not applicable. No private driveways longer than 50 m are likely based on the width of the proposed lots and the proposed development layout Lot 2 and Lot 3 shown in Appendix A . If private driveways longer than 50 m are proposed as part of future stages not assessed as part of this BMP, these should be designed to comply with the requirements detailed in Appendix Four of the Guidelines. This includes (or as agreed with the Shire of Serpentine Jarrahdale):	
N/A	N/A	<ul style="list-style-type: none"> • Requirements in Table 6, Column 3 of the Guidelines • Minimum 20 m-long passing bays every 200 m where the driveway is less than 6 m-wide. • Turn-around areas suitable for type 3.4 appliances within 50 m of a building • Constructed of an all weather surface suitable for two-wheel drive vehicles. 			

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement
		Acceptable solution	Performance principle		
Element 3: Vehicular access (continued from above)	Continued from above.	A3.6 Emergency access way		The subdivision of the site will support egress to at least two destinations, with the proposed lots within the site accessing Robertson Road that will connect to South Western Highway and Orton Road. On this basis, an emergency access way (EAW) is not required. However, it is possible as part of future staged development, particularly if there are delays to the construction of Orton Road when development south of Lot 3 is progressed, that a temporary EAW may be required. The requirement for an EAW in future development stages should be determined in consultation with the Shire of Serpentine Jarrahdale and Main Roads Western Australia. Where required, an EAW will need to comply with the requirements in Appendix Four of the Guidelines (or as agreed with the Shire of Serpentine Jarrahdale), including: <ul style="list-style-type: none"> • Requirements in Table 6, Column 4 (and in particular, being a minimum 6 m-wide) • Being a maximum 600 m from a public road (unless agreed otherwise) • Provided as a right of way or public access easement • Signposted to indicate it is for emergency access 	Continued from above.
		N/A	N/A		
		A3.7 Fire service access routes (perimeter roads)		Not applicable.	
		N/A	N/A		
		A3.8 Firebreak width		Once development is progressed within the site, in accordance with the Shire of Serpentine Jarrahdale's fire break notice (or as specified by the Shire of Serpentine Jarrahdale in accordance with Section 33 of the <i>Bush Fires Act 1954</i>), firebreaks are unlikely to be required if landholdings are managed clear of all flammable matter to a height of no greater than 150 mm.	
Yes	N/A				

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance statement
		Acceptable solution	Performance principle		
Element 4: Water	To ensure water is available to the subdivision, development or land use to enable people, property, and infrastructure to be defended from bushfire.	A4.1 Reticulated areas		Bushfire events in this area are responded to by a network of metropolitan career Fire and Rescue Service stations and the State Emergency Services (SES) as required. Fire response services require ready access to and adequate water supply during bushfire emergencies. The site will connect with the reticulated water supply network. Fire hydrants installed by the proponent will meet the specifications of Water Corporation (Design Standard DS 63) and DFES. Fire hydrants on non-residential land are generally required to be spaced no greater than 100 m from other hydrants. Commercial development will also be subject to onsite hydrant requirements as specified by the National Construction Code.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 4: Water given it will connect with the reticulated water supply network and appropriate hydrants will be provided.
		Yes	N/A		
		A4.2 Non-reticulated areas		Not applicable.	
		N/A	N/A		
		A4.3 Individual lots within non-reticulated areas (only for use if creating one additional lot and cannot be applied cumulatively)		Not applicable.	
N/A	N/A				

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



5.1 Additional management strategies

5.1.1 Future approval considerations

The BAL assessment within this document is considered to be a conservative assessment of potential bushfire risk posed to future habitable buildings within the site based on the assumptions outlined in **Section 3**.

Following the creation of lot titles, a building licence will be required to construct any new habitable buildings. Where Class 1, 2, 3 or 10a buildings are proposed this BMP and the predicted BAL ratings (see **Figure 5**) can be used to inform the construction requirements for future buildings provided none of the vegetation assumptions within this BMP (i.e. **Figure 3**) are different to that outlined.

5.1.2 Landscape management

5.1.2.1 Within the site/proponent landholding

Where indicated in **Figure 6**, areas will be managed to achieve low threat in accordance with Section 2.2.2.3 of AS 3959 and the principles of the asset protection zone requirements outlined in Element 2, Schedule 1 of Appendix Four of the Guidelines (WAPC and DFES 2017) (or as agreed with the Shire of Serpentine Jarrahdale). An excerpt of the requirements is provided in **Appendix C**.

The management of these areas will be the responsibility of the proponent or future landowners/tenants.

This will be particularly relevant for temporary grassland hazards south of Lot 3, where grasses taller than 100 mm may be present during the stages of the development. Management of this area (until vegetation is permanently removed) will largely be associated with the regular mowing/slashing of grass fuels to less than 100 mm in height.

5.1.2.2 Surrounding the site

Within local roads

The local roads (i.e. Robertson Road) will be designed and/or maintained to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959, as shown in **Figure 3**, and will be the responsibility of the proponent initially and following handover, long term the Shire of Serpentine Jarrahdale. Management of the local roads within the site is likely to include (but is not limited to):

- Regular mowing/slashing of grass/turf to less than 100 mm in height (where present).
- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.

For existing public road reserves, particularly South Western Highway, it is assumed that these areas will be maintained (where applicable) in accordance with existing maintenance regimes.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Private landholdings

Where indicated as a low threat in **Figure 3**, it is assumed that the landholdings surrounding the site will be managed by the applicable landowners in accordance with the Shire of Serpentine Jarrahdale's fire break notice (as published) and/or in accordance with existing maintenance regimes.

Where indicated as classified vegetation in **Figure 3**, these areas have been assumed to remain a bushfire hazard in the long-term.

5.1.3 Shire of Serpentine Jarrahdale Fire Break Notice

The Shire of Serpentine Jarrahdale releases a fire break notice annually (or as required) to provide a framework for bushfire management within the Shire. The Shire of Serpentine Jarrahdale is able to enforce this order in accordance with Section 33(1) of the *Bush Fires Act 1954* and landowners will need to ensure compliance with the fire break notice, as published, or any directions provided by the Shire of Serpentine Jarrahdale.

Following development for commercial purposes, it is likely that landholdings will be required to have all long grass, weeds, etc., slashed, mowed or trimmed down by other means to a height no greater than 150 mm across the entire property.

In particular, all properties that are subject to a bushfire management plan as a result of subdivision approval, development approval or a building permit, must comply with the requirements of such plans. This BMP has specified that land associated with the site will be managed to a low threat standard in the long-term.

5.1.4 Vulnerable or high-risk land uses

No vulnerable or high-risk land uses, as defined under SPP 3.7, are proposed within the site as part of the subdivision (or development application assessed as part of this BMP). Therefore, the requirements of policy measure 6.6 within SPP 3.7 are not applicable.

If any high-risk or vulnerable land uses are proposed in the future (i.e. for the 'remainder of Lot 128', shown in **Appendix A**), the requirements of policy measure 6.6 of SPP 3.7 will need to be addressed, including the assessment of bushfire risk and/or the preparation of an emergency evacuation plan (for vulnerable land uses) or risk management plan (for high-risk land uses).

Currently, it is possible for all proposed lots to be located in an area with appropriate vehicle access to support emergency evacuation and for BAL-29 or less to be achieved at habitable buildings, enabling the requirements of SPP 3.7 to be satisfied.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



5.1.5 Public education and preparedness

Community bushfire safety is a shared responsibility between individuals, the community, government and fire agencies. DFES has an extensive Community Bushfire Education Program including a range of publications, a website and Bushfire Ready Groups. The DFES website (<https://www.dfes.wa.gov.au/bushfire/prepare/>) provides a range of materials to help the community prepare for and survive the bushfire season.

The Shire of Serpentine Jarrahdale provides bushfire safety advice to residents available from their website <https://www.sjshire.wa.gov.au/community/fire-and-emergency-management/firebreaks-and-fire-control.aspx>. Qualified consultants also offer bushfire safety advice and relevant services to residents and businesses in high-risk areas in addition that that provided in this BMP.

In the case of a bushfire in the area, advice would be provided businesses by DFES, the Department of Biodiversity Conservation and Attractions (DBCA) and/or the Shire of Serpentine Jarrahdale on any specific recommendations with regard to responding to the bushfire, including evacuation if required.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



6 Responsibilities for Implementation and Management of Bushfire Measures

Table 5 outlines the future responsibilities of the proponent (developer), future landowners and the Shire of Serpentine Jarrahdale associated with implementing this BMP with reference to ongoing bushfire risk mitigation measures for existing land uses (through compliance with the Shire of Serpentine Jarrahdale fire control notice) or future mitigation measures to be accommodated as part of the development process. These responsibilities will need to be considered as part of the subsequent development and implementation process.

Table 5: Responsibilities for the implementation of this BMP

Management action	Timing
Developer - subdivision	
<p>The landscaped areas within the Robertson Road reserve should be designed, implemented and maintained to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959. Ongoing management is likely to include (but is not limited to):</p> <ul style="list-style-type: none"> • Irrigation of grass and garden beds (where required) • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees. • Application of ground/surface covers such as mulch or non-flammable materials as required. • Regular mowing/slashing of grass to less than 100mm in height. 	<p>As part of subdivision and development, and ongoing as required during the developer maintenance period.</p>
<p>Where indicated in Figure 6, areas are to be maintained as an APZ to achieve low threat in accordance with Section 2.2.3.2 of AS 3959, and Element 2, Schedule 1 of Appendix Four of the Guidelines (WAPC and DFES 2017) (or as agreed with the Shire of Serpentine Jarrahdale). Management of this area will include (but is not limited to):</p> <ul style="list-style-type: none"> • Regular mowing/slashing of grass to less than 150 mm in height (where present). • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.). • Application/replacement of ground/surface covers such as mulch or non-flammable materials as required. <p>This will be particularly relevant for temporary grassland hazards south of Lot 3, that may be present due to the staging of development.</p>	<p>As part of subdivision, and ongoing until development progresses within the remainder of Lot 128</p>
<p>Install Robertson Road (including the temporary turn around area to support staged development) to the standards outlined in Appendix Four of the Guidelines (WAPC and DFES 2017) or as agreed with the Shire of Serpentine Jarrahdale.</p>	<p>To support the clearance of new lot titles (noting Robertson Road does not have to be fully constructed all in one go)</p>
<p>If required, based on discussions with the Shire of Serpentine Jarrahdale and Main Roads, until the public road network associated with development to the south of the site is progressed, install an emergency access way connecting Robertson Road to South Western Highway with a trafficable surface and to the standards outlined in Appendix Four of the Guidelines (WAPC and DFES 2017) or as agreed with the Shire of Serpentine Jarrahdale.</p>	<p>To support the clearance of new lot titles</p>
<p>Reticulated water supply and hydrants to be installed as per standard Water Corporation requirements, unless otherwise agreed.</p>	<p>To support the clearance of new lot titles.</p>
<p>Certify BAL ratings for all lots designated as bushfire prone within the <i>Map of Bush Fire Prone Areas</i> at the time titles are created, based on the BAL Contour Plan (Figure 5) and/or in accordance with a BAL assessment if the site conditions are different.</p>	<p>To support the clearance of lot titles.</p>

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table 5: Responsibilities for the implementation of this BMP (continued)

Management action	Timing
Developer – subdivision (continued)	
For each new lot created within areas exposed to a BAL rating exceeding BAL-LOW, lodge a Section 165 Notification on the Certificate of Title in order to alert purchasers and successors in title of the existence of the overarching BMP and the requirements associated with meeting AS 3959 construction standards. This should be based on the outcomes of the BAL certification process.	To support the clearance of new lot titles.
Make a copy of the BMP and BAL certification/assessment available to each lot owner within a designated bushfire prone area.	During the lot sale process, and ongoing as required.
Developer – development application	
The landscaped areas within the proponent's landholding should be designed, implemented and maintained to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959. Ongoing management is likely to include (but is not limited to): <ul style="list-style-type: none"> • Irrigation of grass and garden beds (where required) • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees. • Application of ground/surface covers such as mulch or non-flammable materials as required. • Regular mowing/slashing of grass to less than 100mm in height. 	As part of development and ongoing as required during the developer maintenance period.
Ensuring all habitable buildings are located in an area subject to a BAL rating of BAL-29 or less	To support development approval and/or as part of building design and construction
Where Class 1, 2, 3 or 10a buildings are proposed to be constructed, these should comply with the construction requirements in AS 3959 based on the highest BAL rating impacting the building.	To support development approval and/or as part of building design and construction
Property owner/occupier	
Maintain landscaped areas within the site to be maintained to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959. Ongoing management is likely to include (but is not limited to): <ul style="list-style-type: none"> • Irrigation of grass and garden beds (where required) • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees. • Application of ground/surface covers such as mulch or non-flammable materials as required. • Regular mowing/slashing of grass to less than 150mm in height. 	Ongoing as required.
Ensuring that their property complies with the Shire of Serpentine Jarrahdale fire control notice/s as published and/or in accordance with directions given by the local government. This includes maintaining the entire lot to a low threat standard until developed.	Ongoing, as required.
Ensuring fire hydrants are accessible at all times.	Ongoing, as required.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table 5: Responsibilities for the implementation of this BMP (continued)

Management action	Timing
Shire of Serpentine Jarrahdale	
Providing fire prevention and preparedness advice to landowners upon request, and the latest Shire of Serpentine Jarrahdale fire control notice.	Ongoing, as required
Maintain all road reserves identified as a low threat that is under their management to a low threat standard in accordance with Section 2.2.3.2 of AS 3959, where required/applicable in accordance with approved designs and/or existing maintenance regimes.	Ongoing, as required
Monitoring vegetation fuel loads in public reserves and liaising with relevant stakeholders to maintain fuel loads at minimal fuel levels, where required/applicable.	Ongoing, as required
Maintaining public road reserves under their management to appropriate standards, where required/applicable.	Ongoing, as required
Monitoring compliance with the Shire of Serpentine Jarrahdale fire control notice and enforcing requirements as required.	Ongoing, as required
Main Roads Western Australia	
Maintain all road reserves identified as a low threat that is under their management to a low threat standard in accordance with Section 2.2.3.2 of AS 3959, where required/applicable in accordance with approved designs and/or existing maintenance regimes.	Ongoing, as required
Water Corporation	
The Water Corporation is responsible for the ongoing maintenance and repair of water hydrants.	Ongoing, as required.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



7 Applicant Declaration

7.1 Accreditation

This BMP has been prepared by Emerge Associates who have been providing bushfire risk management advice for more than seven years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry.

Anthony Rowe has reviewed this BMP and is a Fire Protection Association of Australia (FPAA) Level 3 Bushfire Planning and Design (BPAD) accredited practitioner (BPAD no. 36690) with over ten years' experience and is supported by a number of Emerge team members who have undertaken BPAD Level 1 and Level 2 training and are in the processing of gaining formal accreditation.

7.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Signature:

Name: Anthony Rowe

Company: Emerge Associates/Envision Bushfire Protection

Date: 21 July 2021

BPAD Accreditation: Level 3 BPAD no. 36690

Signature:

Name: Kirsten Knox

Company: Emerge Associates

Date: 21 July 2021

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



8 References

8.1 General references

Department of Planning, Lands and Heritage (DPLH) 2019, Position Statement: Planning in bushfire prone areas - Demonstrating Element 1: Location and Element 2: Siting and design, Western Australian Planning Commission.

Emerge Associates 2019, Bushfire Management Plan - Portion Lot 128 South Western Highway, Byford, EP19-002(01)--001 HPB, Version 1.

Gray and Lewis 2014, Local Structure Plan - Lots 1, 3 and 128 South Western Highway, Byford.

Landform Research 2010, Flora and Vegetation Assessment - Lots 1, 3 and 128 South Western Highway, Byford.

Standards Australia 2018, AS 3959:2018 Construction of buildings in bushfire-prone areas, Sydney.

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

Western Australian Planning Commission and Department of Fire and Emergency Services (WAPC and DFES) 2017, Guidelines for Planning in Bushfire Prone Areas Version 1.3, Western Australia. December 2017.

8.2 Online references

Landgate 2019, *Locate V5*, viewed January 2021, <<https://maps.slip.wa.gov.au/landgate/locate/>>

Office of Bushfire Risk Management (OBRM) 2019, *Map of Bush Fire Prone Areas*, viewed January 2021, <https://maps.slip.wa.gov.au/landgate/bushfireprone/>

Figures



Figure 1: Site Plan and Topographic Contours

Figure 2: Existing Site Conditions – AS 3959 Vegetation Classifications

Figure 3: Post Development Conditions-AS 3959 Vegetation Classifications

Figure 4: Post Development Conditions – Effective Slope

Figure 5: Bushfire Attack Level Contours

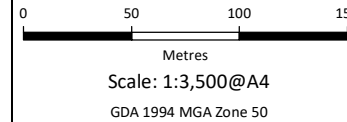
Figure 6: Spatial Representation Plan



Figure 1: Site Plan and Topographic Contours

Project: Bushfire Management Plan
 Portion Lot 128 South Western Highway, Byford
Client: Parsons Management Group Pty Ltd

Plan Number:
 EP19-002(02)-F10
Drawn: GAR
Date: 14/01/2021
Checked: HPB
Approved: KK
Date: 22/01/2021



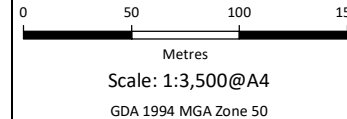
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Figure 2: Existing Site Conditions - AS 3959 Vegetation Classification

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 Portion Lot 128 South Western Highway, Byford
Client: Parsons Management Group Pty Ltd

Plan Number:
 EP19-002(02)-F11
Drawn: GAR
Date: 14/01/2021
Checked: HPB
Approved: KK
Date: 22/01/2021



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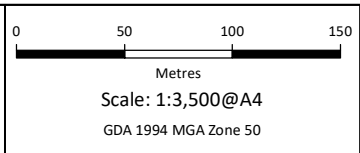


Figure 3: Post Development Site Conditions - AS 3959 Vegetation Classification

Project: Bushfire Management Plan
Portion Lot 128 South Western Highway, Byford

Client: Parsons Management Group Pty Ltd

Plan Number: EP19-002(02)-F12
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Date: 22/01/2021



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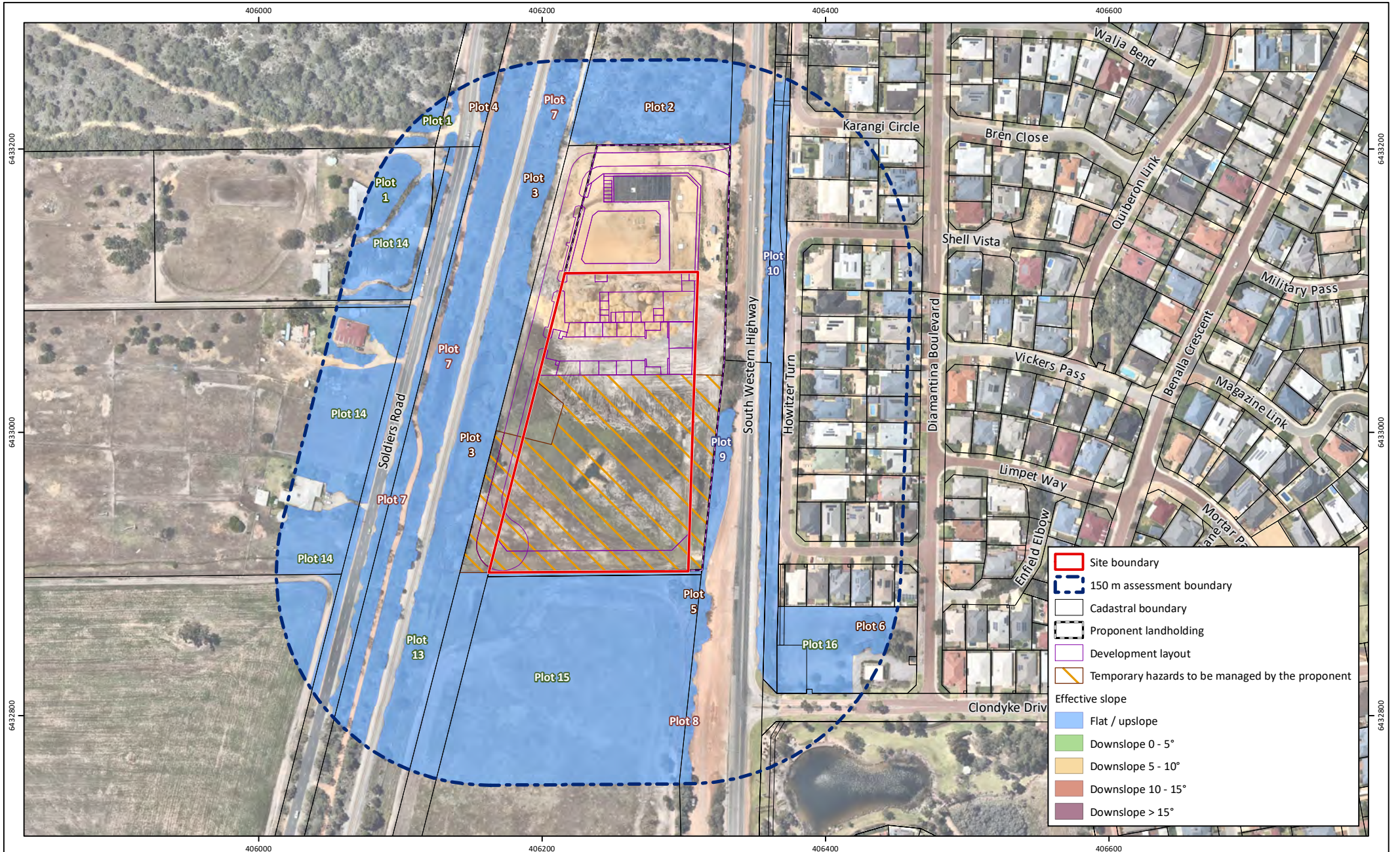


Figure 4: Post Development Site Conditions - Effective Slope

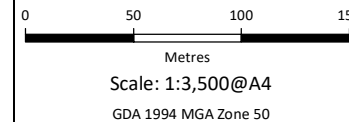
Project: Bushfire Management Plan
 Portion Lot 128 South Western Highway, Byford

Client: Parsons Management Group Pty Ltd

Plan Number:
 EP19-002(02)-F13

Drawn: GAR
Date: 14/01/2021

Checked: HPB
Approved: KK
Date: 22/01/2021



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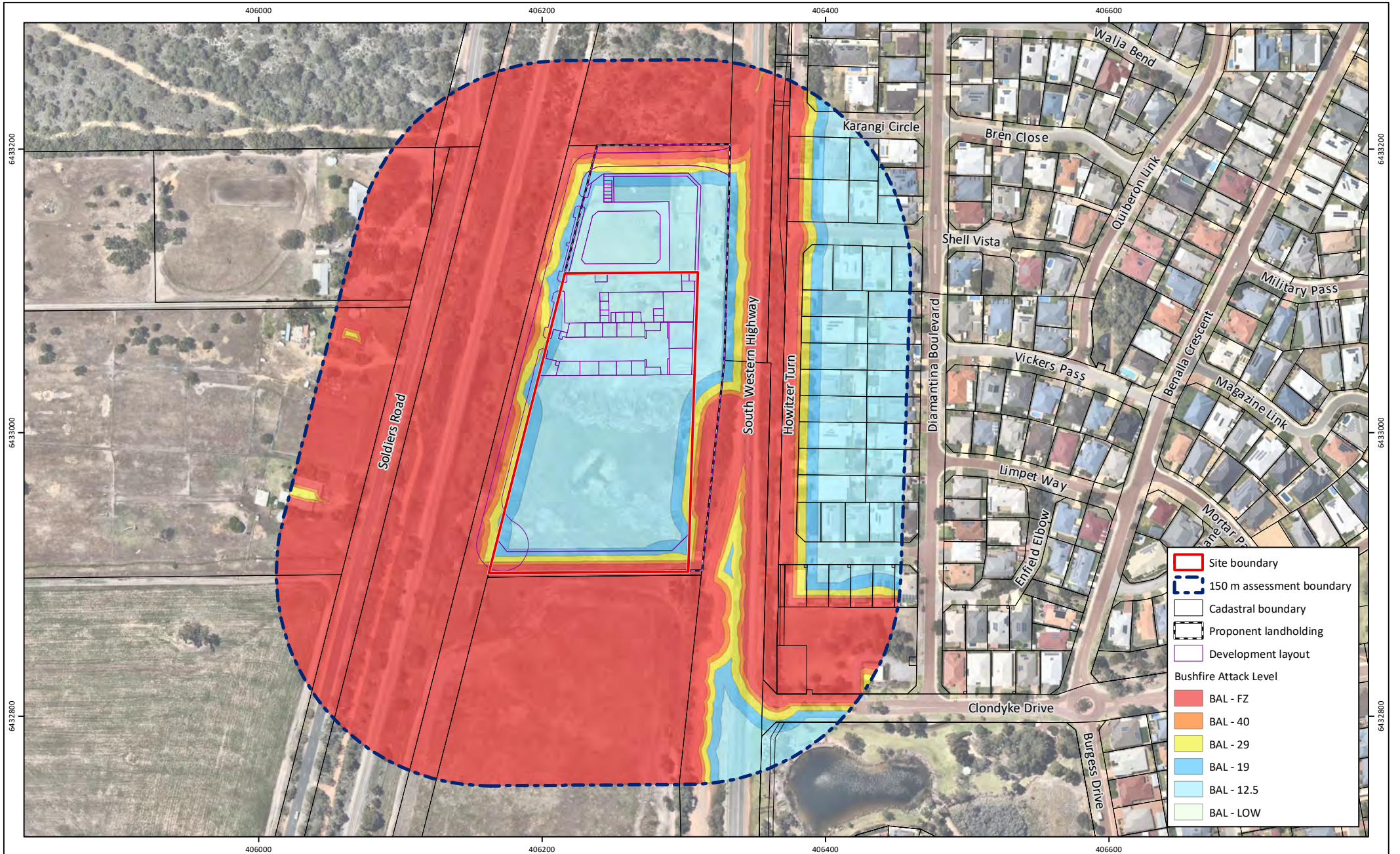
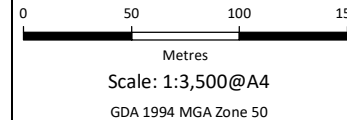


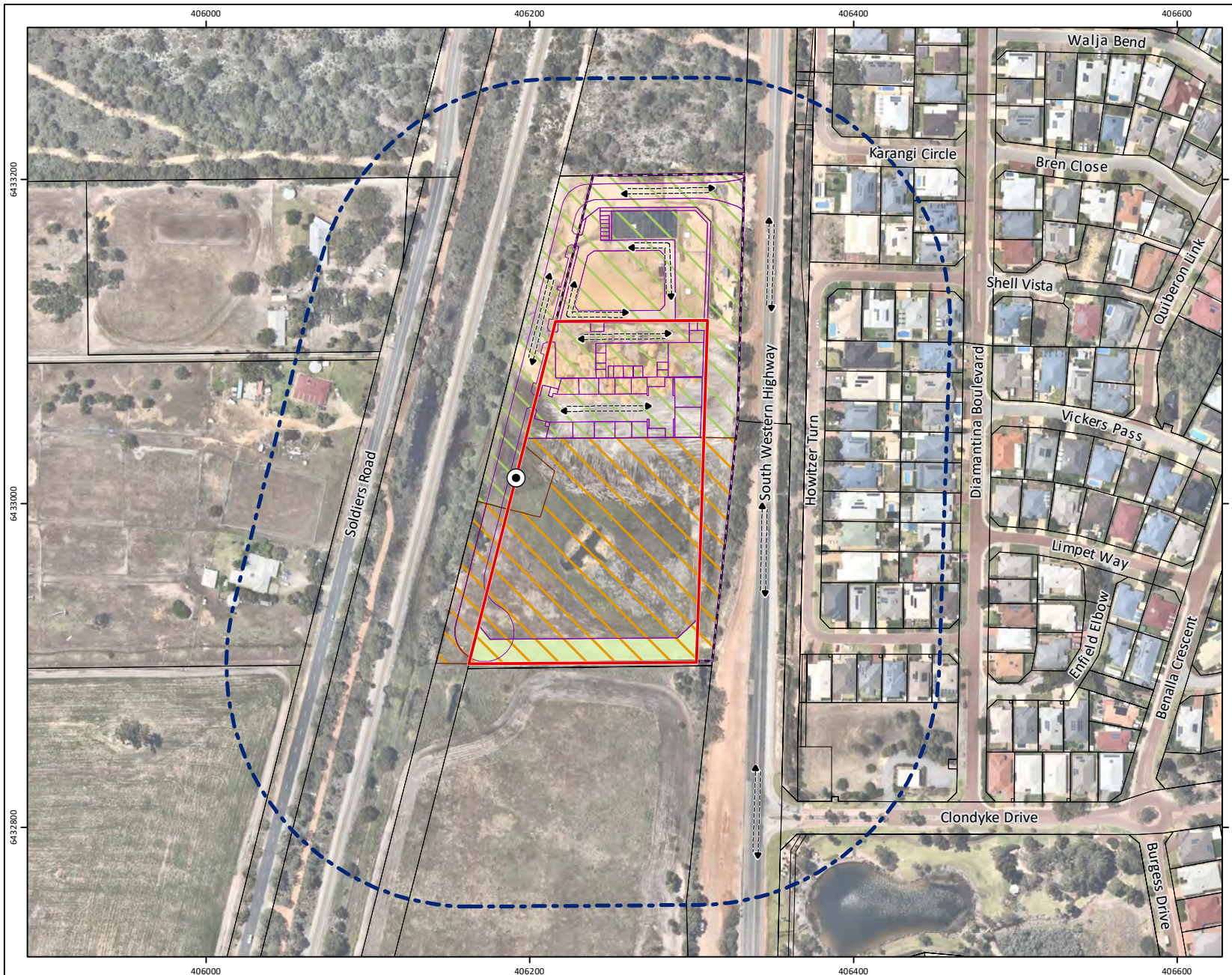
Figure 5: Bushfire Attack Level Contours

Project: Bushfire Management Plan
 Portion Lot 128 South Western Highway, Byford
Client: Parsons Management Group Pty Ltd

Plan Number:
 EP19-002(02)-F14
Drawn: GAR
Date: 14/01/2021
Checked: HPB
Approved: KK
Date: 22/01/2021



While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used
 ©Landgate (2020). Nearmap Imagery date: 19/11/2020



Management requirements:

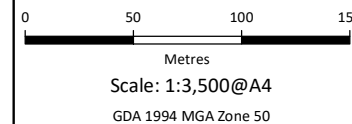
- Where indicated, areas will be managed to 'low threat' in accordance with Section 2.2.3.2 of AS 3959 and the asset protection zone requirements outlined within Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas (WAPC & DFES 2017). This will be the responsibility of the proponent or future landowners/tenants. Robertson Road reserve will be maintained by the Shire of Serpentine Jarrahdale following the two year (or as agreed) developer maintenance period.
- As part of staged development the proponent will be required to construct and maintain (for the period agreed with the Shire of Serpentine Jarrahdale) a temporary cul-de-sac until the public road network is constructed, including the connection to Orton Road.

	Site boundary
	150 m assessment boundary
	Cadastral boundary
	Proponent landholding
	Development layout
	Temporary hazards to be managed by the proponent
	Future extension of Orton Road
	To be maintained to an APZ standard
	Driving direction
	Temporary turn-around area

Figure 6: Spatial Representation Plan

Project: Bushfire Management Plan
Portion Lot 128 South Western Highway, Byford
Client: Parsons Management Group Pty Ltd

Plan Number:
EP19-002(02)--F15
Drawn: GAR
Date: 14/01/2021
Checked: HPB
Approved: KK
Date: 22/01/2021



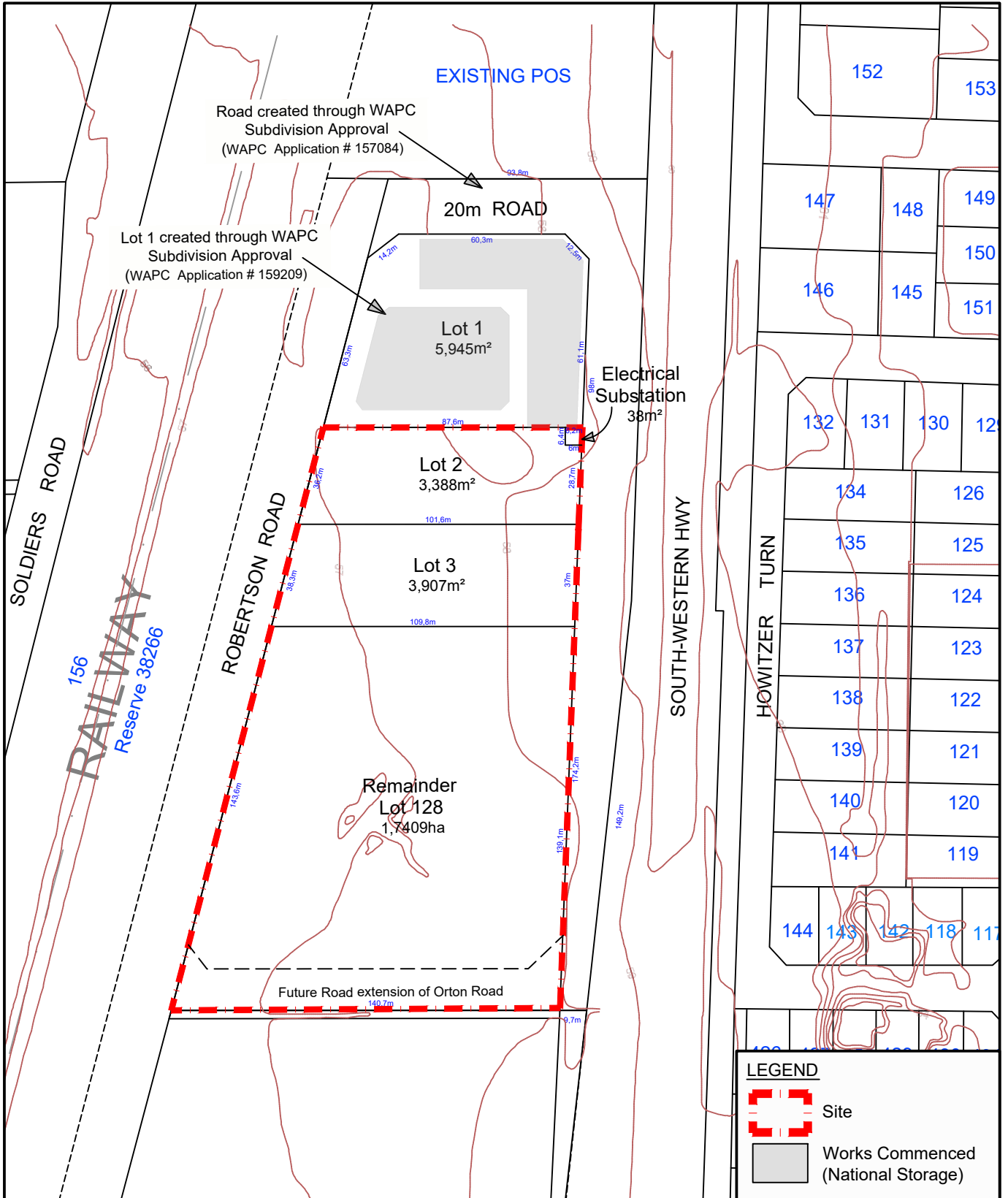
While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used
©Landgate (2020). Nearmap Imagery date: 19/11/2020



Appendix A

Proposed subdivision and development plan (Urbanism 2020)





PROPOSED BYFORD INDUSTRIAL SUBDIVISION

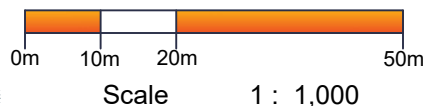
Stage 2 Subdivision Proposal - Portion Lot 128 South-Western Highway, Byford
 (Refer to WAPC Approved Application # 157084 - Plan UP1811/S/1 v1.2)



Urbanism

PO Box 1804
 Subiaco WA 6904

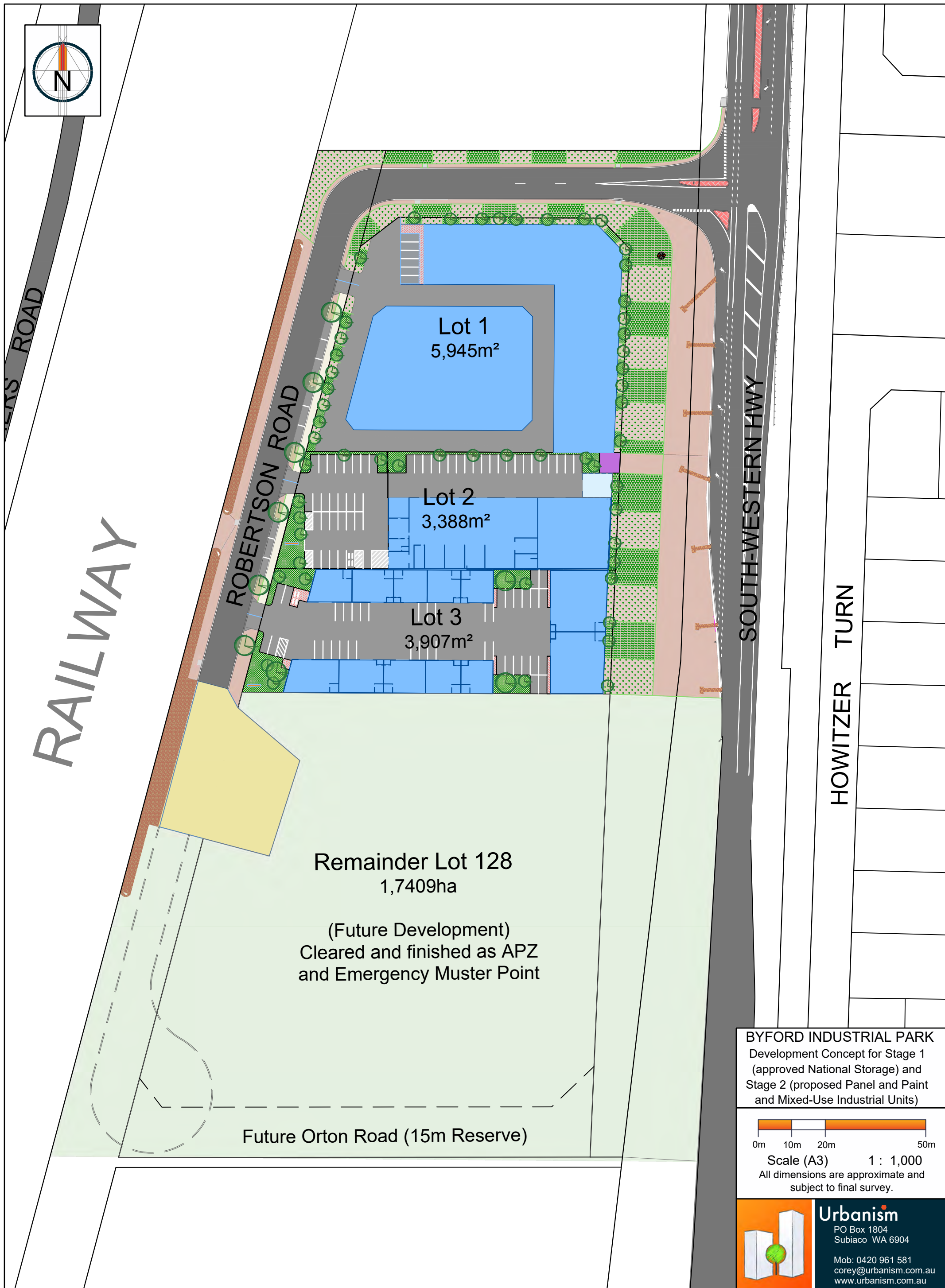
Mob: 0420 961 581
 corey@urbanism.com.au
 www.urbanism.com.au



PDFs are to scale when printed on A4
 All dimensions are approximate and subject to final survey.

Date: 18 December 2020
 File Ref.: UP2004
 Designer: C Vervey

DRAWING NO.:
UP2004/S3
 VER: 1.1



Appendix B

Additional photographs



Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table B1: Additional photo points organised by plot, as shown within Figure 2

Plot 2-6

AS 3959 classification (Figure 2): Woodland (Class B)



Photo location 17: woodland vegetation with the railway reserve (Plot 3), looking north.



Photo location 19: woodland vegetation within the railway reserve (Plot 3), looking north.



Photo location 36: woodland vegetation within landholdings to the east of the site (Plot 6), looking north.



Photo location 47: woodland vegetation within landholdings to the north of the site (Plot 2), looking north.

Plot 7, 8

AS 3959 classification (Figure 2): Shrubland (Class C)



Photo location 9: shrubland vegetation within the railway reserve (Plot 7), looking north-west.



Photo location 14: shrubland vegetation associated with Plot 7, looking north.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Table B1: Additional photo points organised by plot, as shown within Figure 2 (continued)

Plot 11, 12

AS 3959 classification (Figure 2): Grassland (Class G)



Photo location 24: grassland vegetation within the central portion of the site, looking east.



Photo location 26: grassland vegetation within the southern portion of the site, looking north.

Plot 13 - 16

AS 3959 classification (Figure 2): Grassland (Class G)



Photo location 35: grassland vegetation to the east of the site (Plot 16), looking north-west.



Photo location 51: grassland vegetation (Plot 14), looking west. Evidence of regular slashing observed, though grass longer than 100 mm.

Plot 17

AS 3959 classification (Figure 2): Non-vegetated (e)



Photo location 10: non-vegetated areas (access track) within the Perth – Bunbury railway reserve, looking south.



Photo location 23: non-vegetated areas within the site, looking east.

Bushfire Management Plan
 Portion Lot 128 South Western Highway, Byford



Table B1: Additional photo points organised by plot, as shown within Figure 2 (continued)

Plot 18

AS 3959 classification (Figure 2): Non-vegetated (e)



Photo location 28: existing non-vegetated areas (roadside rest area) to the east of the site, looking south.



Photo location 45: non-vegetated areas within the site, looking south-west.



Photo location 46: areas of bare mineral earth within the northern portion of the proponent landholding, looking north-west.



Photo location 53: South Western Highway and cleared shoulders, looking south.

Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford



Appendix C

Excerpt of Schedule 1 of the Guidelines for Planning in
Bushfire Prone Areas (WAPC and DFES 2017) – Asset
protection zone standards



Bushfire Management Plan

Portion Lot 128 South Western Highway, Byford

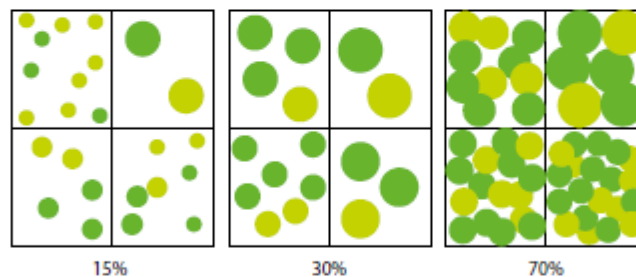


ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

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

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



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

Plate C1: Excerpt from 'Schedule 1: Standards for Asset Protection Zones' as outlined within Appendix Four of the Guidelines (WAPC & DFES 2017).

