



Bushfire Management Plan (Change of Land Use)

Lot 602 (#113) Kawina Road, Bickley

City of Kalamunda

Project Number: 170794

Assessment Date: 5 December 2017

Report Date: 20 June 2018

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Plan Details

BMP Template v5.7


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Plan Version	Submitted to	Submitted Date
v1.0	Landowner	11-Jun-18


Plan Version	Amendment Record	Submitted Date
v1.1	Change of description of Ancillary dwelling	

Compliance Statement

This Bushfire Management Plan (the Plan) meets the requirements of both the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) and the supporting *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017 V1.2; the 'Guidelines').

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Executive Summary

This Bushfire Management Plan (the Plan) has been prepared to accompany the development application for Lot 602 (#113) Kawina Road, Bickley in the City of Kalamunda.

The development site is within a designated bushfire prone area and the Proposal requires the application of *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7). The assessed bushfire risk is considered to be manageable and will be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in this Plan.

Assessment of the planned location, vegetation and consideration of planned infrastructure indicates that compliance is able to be achieved against all applicable bushfire related legislation, policy, standards and guidelines, including the Bushfire Protection Criteria.

Against the Bushfire Protection Criteria, the decision maker's assessment of this Proposal is to be on the basis of it being able to meet the acceptable solutions for all four elements once construction and landscaping is complete.

At the north-west corner of the subject lot, a 3 metre firebreak runs along the eastern boundary of the neighbouring Lot 12 and a cleared area exists on the northern abutting Lot 501. These 2 areas contribute to the achievable BAL-29 rating for the proposed restaurant (Class 8).

For other existing and proposed buildings on the lot, the establishment of the recommended Asset Protection Zones, around the buildings and within the lot boundaries, will achieve a BAL-29 rating.

Vegetation will be removed from this site to enable construction to take place. It is proposed to clear or manage this vegetation to the extent that it achieves the minimum required separation distances from the identified areas of classified vegetation. This will achieve a BAL rating of BAL-29 for the proposed buildings. Areas within APZs will be parkland cleared to achieve a Low Threat state as defined by clause 2.2.3.2(f) of AS3959-2009. However, mature habitat trees (marri and jarrah) will be retained within the APZs for environmental reasons.

As the Day Spa will be a Class 6 building it will not be required to be constructed to a BAL construction standard. It is thus crucial that the separation distances for that building be maintained to enhance its survivability during a bushfire. BAL-29 separation distances for all proposed and existing buildings are provided in this Plan.

The three existing habitable buildings were identified as having BAL ratings ranging from BAL-29 to BAL-40. None of the three existing habitable buildings on-site have been constructed to a BAL standard. Under City of Kalamunda regulations, the house and workshop / shed will be required to have an appropriate 20m APZ installed around them, as shown in the contour map. The proposed restaurant, as part of the proposed development, will be required to maintain the separation distances required to achieve BAL-29 to remain compliant.

It is recommended that the existing buildings should be modified to comply with the construction standards corresponding to BAL-12.5 as a minimum. The primary intention of constructing to this standard is to reduce the impact of an ember attack. This may require retrofitting of certain components.

The development will have two avenues of access and egress: Kawina Road (the primary access) and Lawnbrook Road (the secondary access). Kawina Road provides safe access and egress to two different destinations via Hill Street at a distance of approximately 300m. As a sealed public road it is available to all residents and the public at all times and under all weather conditions.

A separate access way will be provided through the installation of a private driveway from Lawnbrook Road to the development site. Lawnbrook Road provides safe access and egress to two different destinations. As a sealed public road it is available to all residents and the public at all times and under all weather conditions. This will be approximately 200m long. The existing slope of the land will exceed the 1 in 10 technical requirement for maximum grade, as the slope is 11°, or 18%. Internal driveways will also be installed to each of the chalets and the Day Spa. These will also be constructed to meet the technical requirements.

While neither the Kawina Road access nor the Lawnbrook Road access meet the technical requirements, between the two of them they are considered to meet the intent of Element 3 of the BPC, “to ensure that the vehicular access serving a development is safe and available during a bushfire event”. In this case they provide multiple points of access and egress for the public and emergency services, and mitigate against the legacy issues of slope and Kawina Road.

The development site has compliant firebreaks installed and these will be maintained in accordance with the City of Kalamunda annual Firebreak Notice.

The site is amply supplied with water for firefighting purposes. Reticulated water is supplied to the site and the nearest hydrant is located 300m to the west on Hill Street (near the corner with Kawina). The site also has two existing 120,000 litre water tanks, and a third is to be installed adjacent to the proposed chalets and Day Spa. Of the existing tanks the one situated on the east boundary will have appropriate couplings installed. The new water tank will be installed to meet the technical requirements for access by firefighting vehicles.

There is an outstanding requirement, created by this bushfire management plan, that before occupancy of the proposed buildings, a bushfire evacuation plan that addresses the circumstance of bushfire will be required.

An environmental report has been prepared for this development and should be referred to for further information about the site.

1 Proposal Details

1.1 Application of SPP 3.7

The *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) provides the foundation for land use planning to address bushfire risk in Western Australia.

This Proposal must consider SPP 3.7 and, if required, comply with its policy measures. The determination of this requirement is presented below.

Application of SPP 3.7 Policy Measures – Primary Triggers

The subject Proposal is a higher order strategic planning document, a strategic planning proposal or a subdivision or development application: ✓

The project site is in a designated bushfire prone area on the WA Map of Bushfire Prone Areas: ✓

The project site is not located in a designated bushfire prone area on the WA Map of Bushfire Prone Areas but the existing vegetation type and condition dictate that it should be:

The project site is in an area not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard (*Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2 s3.2.2*):

Application of SPP 3.7 Policy Measures – Secondary Trigger/s

The Proposal is a strategic planning proposal, subdivision or development application relating to land that has or will have a Bushfire Hazard Level above low and/or where a Bushfire Attack Level rating above BAL-LOW applies (SPP 3.7 s6.2): ✓

The subject Proposal is a development application for the construction or/and use of a single house or ancillary dwelling on a lot or lots greater than 1100m² and subject to BAL-40 or BAL-FZ (LPS Amendment Regulations 2015):

The subject Proposal is a development application for the construction or/and use of a habitable building (other than a single house or ancillary dwelling), or a specified building on any lot size and subject to a BAL rating above BAL-LOW (LPS Amendment Regulations 2015):

1.2 Commissioning and the Land Use Proposal

Bushfire Prone Planning (BPP Group Pty Ltd) has been commissioned to carry out the assessments and prepare the required bushfire planning documentation to accompany the proponent's planning submission associated with their proposed land use project.

Commissioning Record

Landowner / Proponent: Trent Poletti

BPP Commissioned by: Trent Poletti

Purpose: To accompany a development application

Project Location

Subject Site and Address: Lot 602 (#113) Kawina Road, Bickley

Local Government: City of Kalamunda

Zoning and R-Code: Rural Landscape Interest (No R-Code)

Project Description

Description: Development of land for tourism purposes (Holiday chalets, ancillary accommodation and Day Spa)

Building Class: 1a, 1b and 6













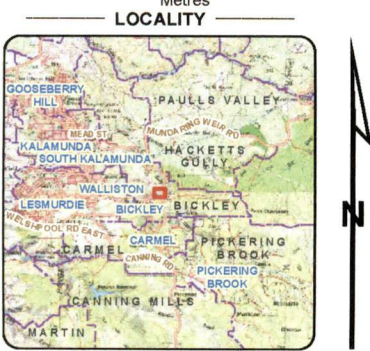
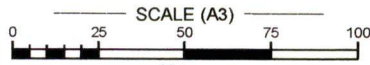
Figure 1.1: Proposed development spatial context map

Figure 1.2
Proposed Development

Lot 602 on Plan 73790
Kawina Street
BICKLEY

LEGEND

-  Subject Area : Lot 602
-  Other Lots
- Proposed Building**
-  Class 1(a)
-  Class 1(b)
-  Class 6
-  Class 8
-  Eaves, verandah etc
- Existing Building**
-  Class 1(a)
-  Class 10(a)
-  Eaves, verandah etc



Aerial Imagery : Landgate/SLIP
Image Date : JAN/FEB 2018

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Russell Wormes
Date map compiled/updated: 20/08/2018

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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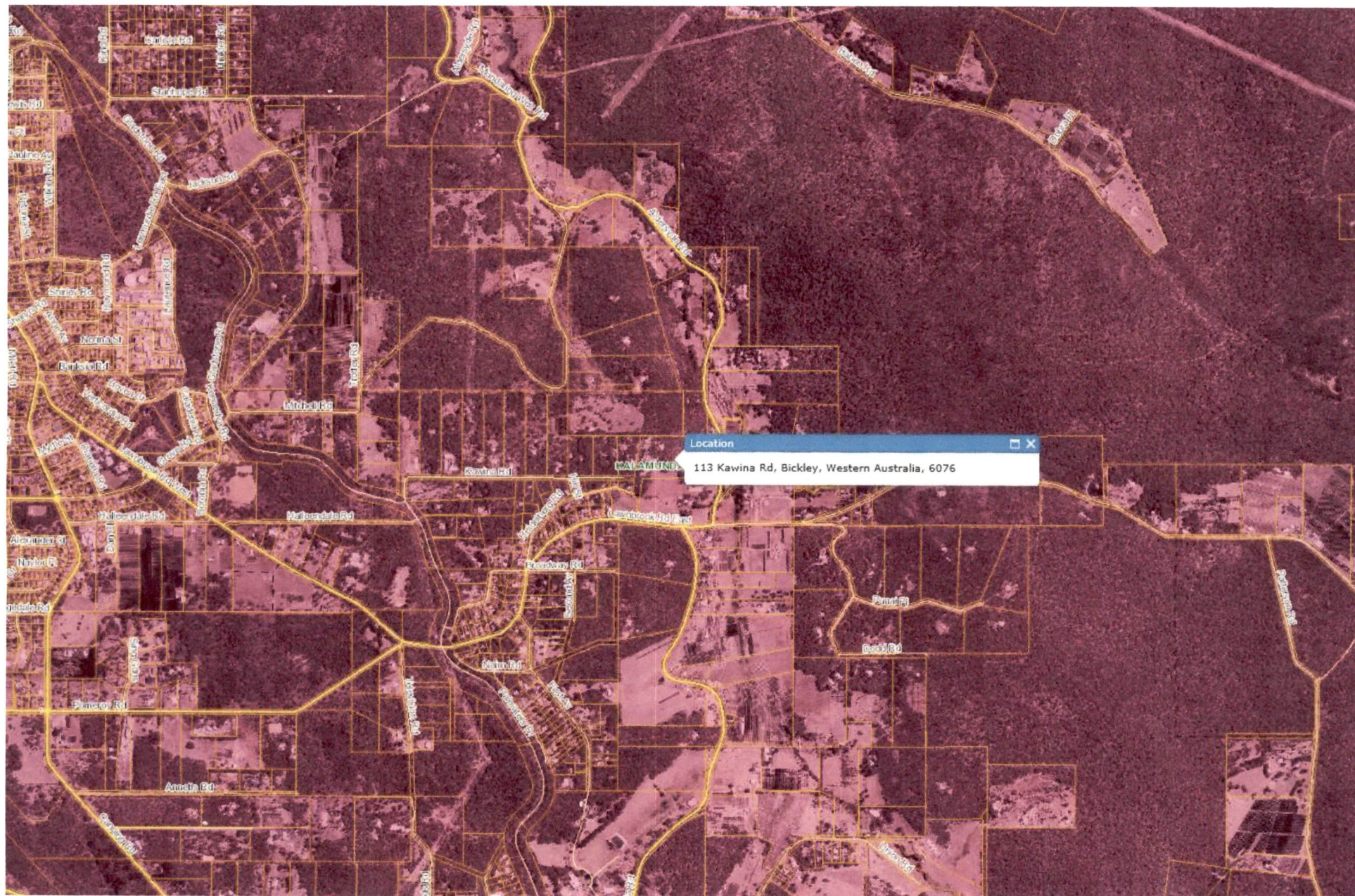


Figure 1.3: Map of bushfire prone areas

1.3 The Planning Submission and the Documents Required

Policy measures in *SPP 3.7* (and further instruction in the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2*) set out the bushfire planning information (including bushfire risk assessments) that are to accompany a planning submission. It is dependent on the type of proposal and stage of the development process. In most circumstances this information is to be presented in the form of a Bushfire Management Plan (BMP).

The Planning Submission – Stage and Specific Land Use or Development

Planning Stage:	Development application
For Submission to:	City of Kalamunda
Project Type:	Addition to land use
'Vulnerable' Land Use:	Yes
'High Risk' Land Use:	No
'Minor' Development:	No
'Unavoidable' Development:	No

This Bushfire Management Plan will include the information indicated by the check mark. If an item is checked it is required by either: *SPP 3.7* or by a local government variation. It may also have been prepared at an earlier planning stage and therefore re-included or included by the assessor as it improves the information presented in this Bushfire Management Plan.

Bushfire Hazard Level Assessment	Bushfire Attack Level Contour Map	Bushfire Attack Level Assessment	Identify any issues arising from the BAL contour map or BAL assessment	Identify and specifically address the list of issues related to strategic level planning and defined in the <i>Guidelines s5.2</i>	Demonstrate compliance with the Bushfire Protection Criteria can be achieved in subsequent planning stages	Demonstrate compliance with the Bushfire Protection Criteria
	✓		✓			✓

For vulnerable and high risk land use and development in areas with an extreme bushfire hazard level and/or areas where BAL-40 or BAL-FZ applies, the following additional bushfire planning information will accompany and/or be included in this Bushfire Management Plan.

Vulnerable Land Use		High Risk Land Use	Minor Development	Unavoidable Development
Provision for Emergency Evacuation	Emergency Evacuation Plan for Proposed Occupants	Risk Management Plan for Flammable On-site Hazards	Statements Against SPP 3.7 s6.7.1 items (a) to (d)	Statements Against SPP 3.7 s6.7.2 items (b) and (d)

✓

Note that for vulnerable and high risk land uses involving Class 4 to Class 9 buildings, the planning process focuses on location, siting, vehicular access and firefighting water supply and not building construction requirements - as the Building Code of Australia only applies to Classes 1, 2, 3 and associated Class 10a buildings or decks. However, the construction requirements as set out in AS 3959 – 2009 can be utilised voluntarily to enhance a buildings survivability if it is subject to a bushfire.

2 Environmental Considerations

“Many bushfire prone areas also have high biodiversity values. SPP 3.7 Policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values” (‘Guidelines’ s2.3).

“Clearing of native vegetation in Western Australia requires a clearing permit under Part V, Division 2 of the Environmental Protection Act 1986 unless clearing is for an exempt purpose. Exemptions from requiring a clearing permit are contained in Schedule 6 of the Act or are prescribed in the Environmental Protection Regulations” (‘Guidelines’ s2.3).

Existing conservation areas that are potentially affected by the development proposal are required to be identified. This may result in vegetation removal/modification prohibition or limitations. These areas include:

- National Parks;
- Nature Reserves; and
- Bush Forever sites.

Further, the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), administered by the Australian Government Department of Environment, provides a national scheme of environment and heritage protection and biodiversity conservation. The objectives of the of the EPBC Act include the protection of the environment with respect to matters of national environmental significance and conservation of Australian biodiversity.

Nationally threatened species and ecological communities are a specific matter of significance. Areas of vegetation can be classified as a Threatened Ecological Community (TEC) under the EPBC Act and consequently have removal restrictions imposed.

2.1 Native Vegetation and Re-vegetation

Protection of Native Vegetation

For the proposed development site, have any existing conservation areas been identified?	No
Type of existing conservation classification:	N/A
Other identified conservation issue to be considered:	Habitat Trees
For the proposed development site, have any areas of native vegetation been identified as species that might result in the classification of the area as a Threatened Ecological Community (TEC)?	No
Potential TEC species identified:	N/A

Comment: An environmental report has been prepared for this development and should be referred to for further information with regards to the site.

Minimising Removal of Native Vegetation

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of Asset Protection and Hazard Separation Zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available options to minimise the removal of native vegetation.

Options to Minimise Removal of Native Vegetation	Considered and Implemented in this Proposal
Cluster development	Considered and will be determined by the building envelope. See comment below.
Construct building to a higher standard as per BCA and AS 3959-2009	Yes
Modify the development location	Considered and will be determined by the building envelope. See comment below.

Comment: The intention in defining the building locations and Asset Protection Zones will be to both achieve minimal removal of native vegetation and a BAL-29 rating or lower while working within the achievable BAL's.

3 Assessment of Bushfire Risk

3.1 Vegetation Assessment/Classification and Ground Slope

3.1.1 Existing Vegetation

All vegetation within 150 metres of the subject site has been identified and classified or excluded and presented in Table 5.1.1. This has been done with accordance with AS 3959-2009 and reference to the *Visual Guide for Bushfire Risk Assessment in WA* (WAPC February 2016).

The vegetation has been assessed as it will be in its mature state and where deemed appropriate, in its unmanaged state. The areas of classified vegetation that will determine bushfire risk are defined on the topography and vegetation map Figure 3.1. Representative photos of each vegetation area are presented after the table.

Table 3.1.1: Vegetation types identified, the applied classification and effective slope

All Vegetation Within 150 metres of Subject Site			
Vegetation Area	Identified Types (AS3959) or Description if 'Excluded'	Applied Classification	Effective Slope Under Classified Vegetation (degrees)
1	Sown Pasture G-26	Class G Grassland	14
2	Woodland B-05	Class B Woodland	8
3	Woodland B-05	Class B Woodland	2
4	Sown Pasture G-26	Class G Grassland	2.5
5	Open Forest A-03	Class A Forest	13
6	Open Forest A-03	Class A Forest	6
7	Open Forest A-03	Class A Forest	0
8	Open Forest A-03	Class A Forest	0
9	Open Forest A-03	Class A Forest	4
10	Managed gardens and lawn	Excluded 2.2.3.2(f)	N/A

Note: When more than one vegetation type is present each type is classified separately with the worst case scenario being applied. The predominant vegetation is not necessarily the worst case scenario.

Areas 5, 8 and 9 are essentially the same contiguous connected piece of vegetation, but have been separated into three assessment areas in order to accurately reflect changes in slope across the site.

Vegetation Area 1

Classification Applied: Class G Grassland

Assessment Comment: Pasture with occasional trees (<5% overstorey)



Photo ID: 1a



Photo ID: 1b



Photo ID: 1c

Vegetation Area 2

Classification Applied: Class B Woodland

Assessment Comment: Marri overstorey with limited middle storey and understorey of grass. Assessed as Class B in accordance with the *Visual Guide for Bushfire Risk Assessment in WA* (WAPC February 2016).

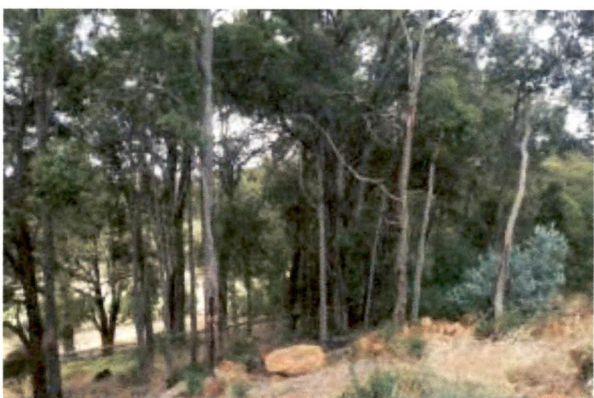


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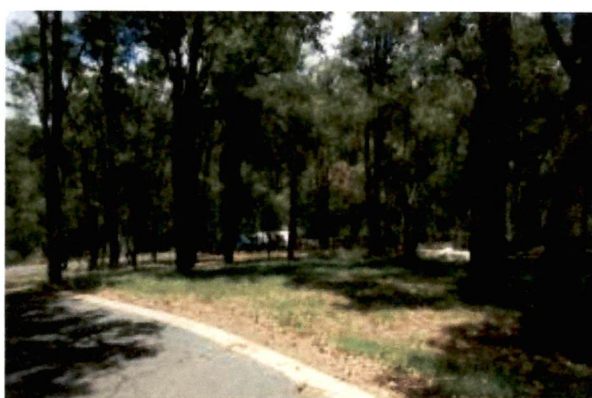


Photo ID: 2b

Vegetation Area 3

Classification Applied: Class B Woodland

Assessment Comment: Marri and jarrah overstorey with grass understorey. Assessed as Class B in accordance with the *Visual Guide for Bushfire Risk Assessment in WA* (WAPC February 2016).



Photo ID: 3a



Photo ID: 3b

Vegetation Area 4

Classification Applied: Class G Grassland

Assessment Comment: Pasture with occasional trees (<5% overstorey)



Photo ID: 4a



Photo ID: 4b

Vegetation Area 5

Classification Applied: Class A Forest

Assessment Comment: Dense jarrah / marri forest with clear tiered structure

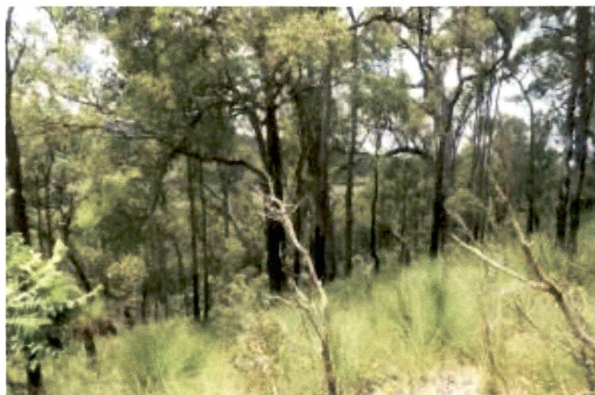


Photo ID: 5a



Photo ID: 5b

Vegetation Area 5 continued



Photo ID: 5c



Photo ID: 5d

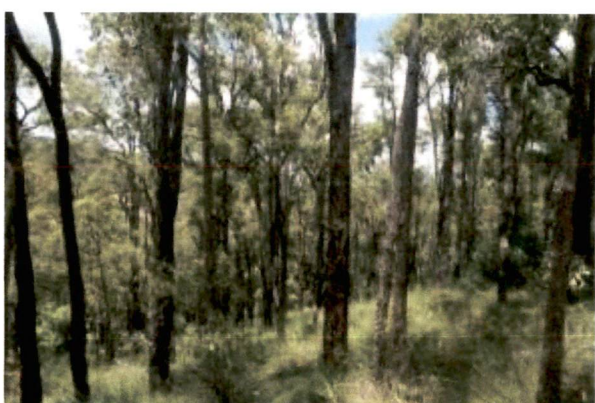


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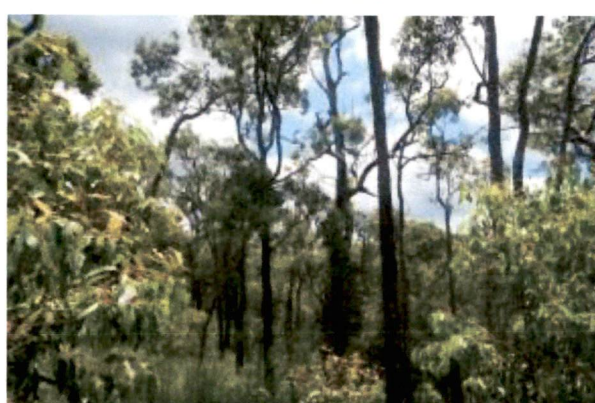


Photo ID: 5f



Photo ID: 5g

Vegetation Area 6

Classification Applied: Class A Forest

Assessment Comment: Dense jarrah / marri forest with clear tiered structure

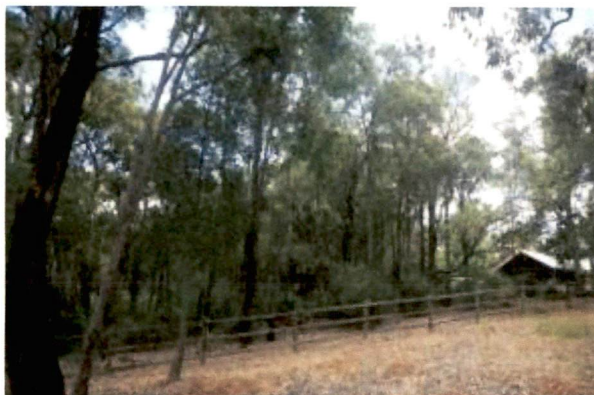


Photo ID: 6a



Photo ID: 6b

Vegetation Area 7

Classification Applied: Class A Forest

Assessment Comment: Dense jarrah / marri forest with clear tiered structure

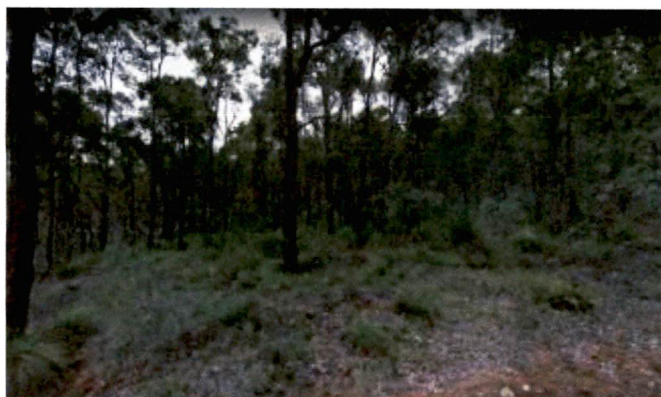


Photo ID: 7a

Vegetation Area 8

Classification Applied: Class A Forest

Assessment Comment: Jarrah / marri forest with clear tiered structure



Photo ID: 8a



Photo ID: 8b

Vegetation Area 9

Classification Applied: Class A Forest

Assessment Comment: Jarrah / marri forest with clear tiered structure



Photo ID: 9a



Photo ID: 9b

Vegetation Area 10

Classification Applied: Excluded AS3959-2009 2.2.3.2 (f)

Assessment Comment: Managed garden areas, structures and car parking areas



Photo ID: 10a

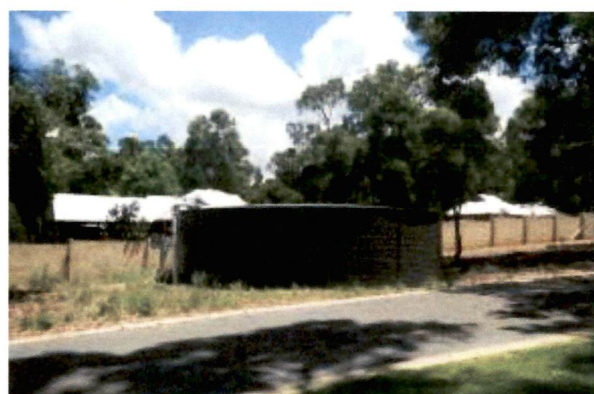


Photo ID: 10b



Photo ID: 10c



Photo ID: 10d

Vegetation Area 10 continued



Photo ID: 10e



Photo ID: 10f

3.1.2 Vegetation Excluded from Classification

Certain areas and vegetation within 100m of the subject site may be assessed as 'low threat or non-vegetated'. These are to be excluded from classification and are therefore rated BAL-LOW. They must be managed to maintain the specifications set out in AS3959-2009 s2.2.3.2 in perpetuity (refer to Appendix 3 'Vegetation Classification Exclusions').

Managed gardens and driveways surrounding some of the buildings on the site have been excluded from classification as presenting a low bushfire threat as per AS 3959-2009s2.2.3.2 (f).

3.1.3 Expected On-site Vegetation Changes Due to Proposed Development

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed, particularly those that would have the potential to increase the bushfire risk.

This may be due to growth of existing vegetation or growth of planned landscape plantings, including future roadside or water course re-vegetation. There must be careful consideration of the creation of vegetation corridors where they join offsite vegetation and may provide a route for fire to enter an area of future development.

For this Proposal the future onsite vegetation has been considered and areas excluded from classification are expected to be maintained as "low threat" with a BAL rating of BAL-LOW. It is also expected that areas shown inside It will meet AS 3959-2009 s2.2.3.2 requirements (refer Appendix 3 'Vegetation Classification Exclusions').

The building site currently retains its native vegetation and as such there is no separation from the classified vegetation and the proposed building work. The intention is to remove and/or modify the required vegetation from and around the proposed building site to the extent required such that it will be subject to a BAL rating no greater than BAL-29.

Mature trees with a canopy coverage of greater than 15% will be retained in some of the APZs. This is due to their identification as habitat trees and subsequent protection under applicable State and Federal environmental legislation. Please see the Environmental Report for more details.

In certain circumstances such as this, it is appropriate to maintain mature tree canopy cover significantly greater than 15% within an APZ, provided there is no surface, near surface, or elevated fuels below that canopy (ie it has been parkland cleared or similar). In this case “mature tree canopy” refers to trees taller than 10m with significant vertical separation between the canopy and ground below. The retention of mature trees is supported by extensive scientific investigation that shows that:

1. Crown fires are dependent on the vegetation beneath them and cannot occur without a fire first occurring in the surface, near-surface and elevated fuels below the canopy;
2. Independent crown fires, where the fire detaches from the surface fire and runs independently through the canopy in-front of the surface fire, can only occur in tree species that have very dense individual canopy structural density (expressed as the volume of leaf mass per area in the canopy strata ie, the mass of leaves produced by each species – Thomas *et al* 2016). Eucalypt species do not have a canopy density great enough to support an independent crown fire. Species with an individual canopy density capable of supporting an independent crown fire include pines, cedars, peppermints, and species with dense needle type leaves; and
3. Trees provide radiant heat and ember screening for buildings, and serve to reduce windspeeds.

Tree species which have low canopy density are only capable of passive or active crown fires, where the crown fire is attached to burning in the fuels below them (O’Byrne 2005: 381). Jarrah (*Eucalyptus marginata*) is an example of a eucalypt species with low canopy structural density (Grigg *et al* 2008). Eucalypt species with low canopy structural density will thus not support an independent crown fire. As such any passive or active crown fire will die when it reaches an area where there are no surface, near-surface or elevated fuels to support it. Parkland clearing meets this definition, and also meets the definition of “low threat” and can thus be excluded from classification under clause 2.2.3.2(f) of AS3959-2009.

Due to low structural density, most Australian eucalypt forests are not capable of sustaining independent crown fires, even in the worst fires. For example, at the Kilmore East fire during Black Saturday, while a significant active crown fire with flame lengths up to 20m above the top of the canopy occurred, this still did not develop an independent crown fire (Cruz *et al* 2012: 275). Likewise, recent major Western Australian bushfires such as the Lower Hotham fire in 2015 (Burrows *et al* 2015) and the Waroona fire in 2016 (McCaw *et al* 2016) had significant active crown fire but no independent crown fire activity.

The standard APZ canopy restrictions should be maintained for tree species capable of sustaining an independent crown fire. For pine species Kim *et al* (2016) demonstrated that spacings of 6m between individual trees were required to limit crown fire development on significantly steep slopes.

The retention of trees within an APZ can also help protect structures from intense wildfires. Trees retained within an APZ can be effective at limiting radiant heat exposure on a building from an approaching fire front (Leonard 2009: 27), and in addition, can screen a building from windblown

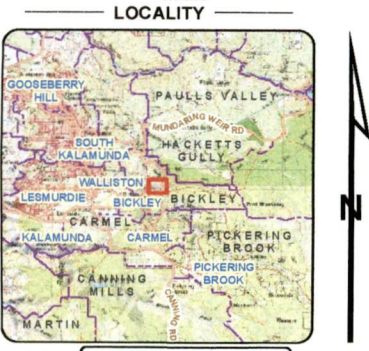
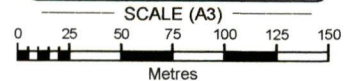
embers and reduce wind speeds around a structure (Leonard 2009: 24, 30; Tasmania Fire Service 2013: 12). It should be noted however that trees overhanging structures should be avoided as these can break during fires and buildings can be subject to branch strike.

Tree bark, particularly that for stringy or ribbon bark tree species, should be considered bushfire fuel (Hines *et al* 2010). Where trees are retained within an APZ it is important to manage the bark fuels by removing the outer layers periodically.

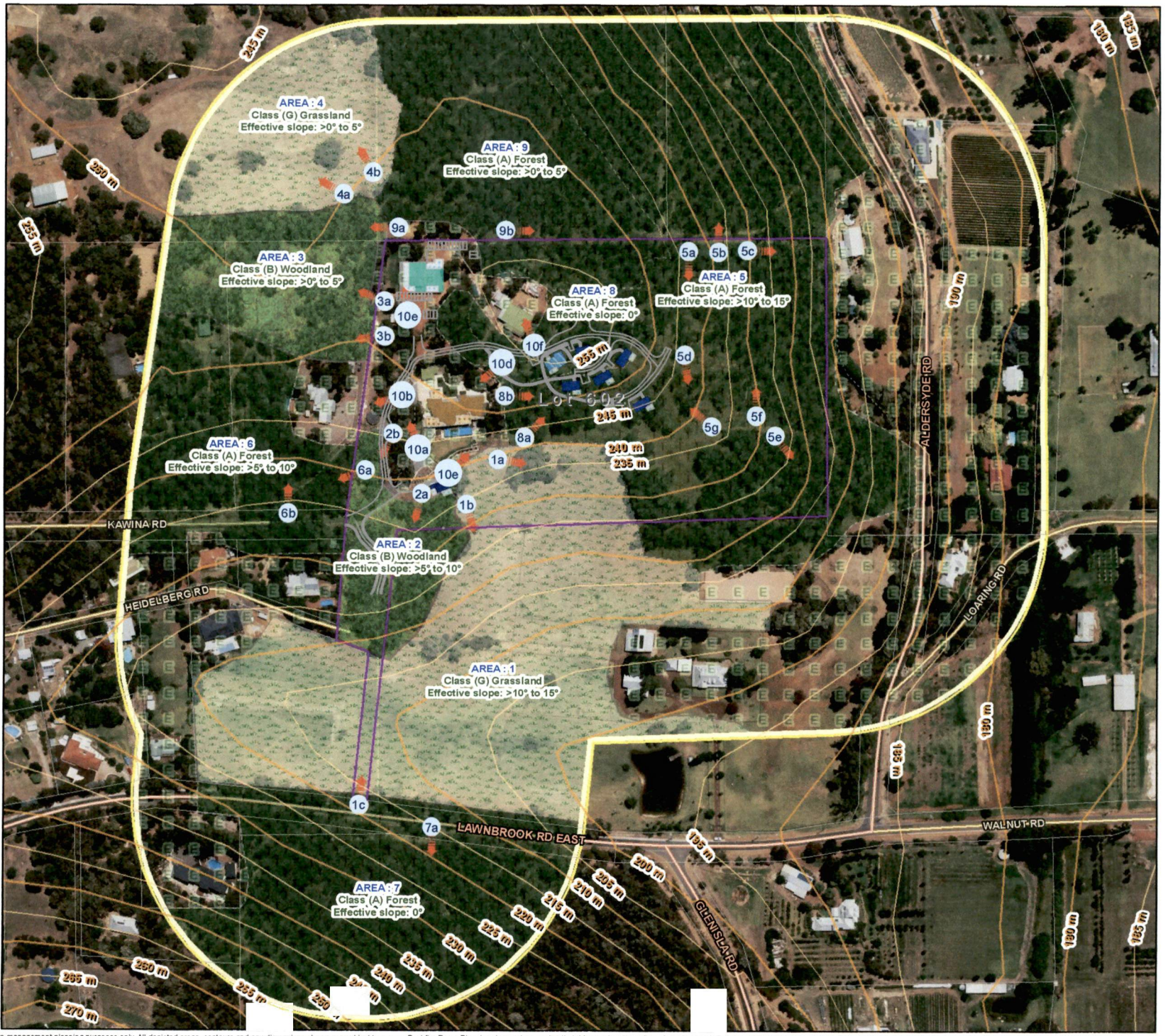
Figure 3.1
**Topography &
 Classified Vegetation**
 Lot 602 on Plan 73790
 Kawina Street
 BICKLEY

LEGEND

- Subject Area: Lot 602
- Other Lots
- Proposed Building**
 - Class 1 (a)
 - Class 1 (b)
 - Class 6
 - Class 8
 - Decking, Eaves etc
- Existing Building**
 - Class 1 (a)
 - Class 10(a)
 - Eaves, Verandah, patio, etc;
- Assessment Area**
 - Vegetation - 150m
- Classified Vegetation**
 - Class (A) Forest
 - Class (B) Woodland
 - Class (G) Grassland
 - Exclusion 2.2.3.2
 - Elevation contour (m)
 - Photo no., location & direction



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Russell Worries
 Date map compiled/updated: 5/06/2018



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and all dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.
 Document Path: G:\BushfireProne\Mapping\MXD\170794_Lot 602 (H113) Kawina Road, Bickley_BMP_(A3L).mxd

3.2 Bushfire Attack Level (BAL) Assessment – BAL Contour Map

Bushfire Prone Planning's BAL Contour Map Guide

Description and Purpose of the BAL Contour Map ('Guidelines')

A Bushfire Attack Level (BAL) Contour Map identifies land suitable and unsuitable for development and guides the location of building envelopes within a development site. The BAL Contour Map is a scale map of a development site (which can include proposed or an existing lot layout), which identifies indicative BAL ratings across the development site and within the immediate surrounding area. The map illustrates potential bushfire attack levels and radiant heat impacts in relation to any classified vegetation that will remain within 150 metres of the assessment area once development is constructed i.e. when the land has been cleared and all the subdivision works have been undertaken. It needs to take into account any vegetation that will remain or will be introduced when the works are complete (source: *WAPC Factsheet "BAL Contour Maps" Version 2 January 2016*).

BAL Contour Map Interpretation

The contour map will present different coloured contour intervals constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels (BAL's) that exist as the distance increases away from the classified vegetation. Each BAL represents a set range of radiant heat flux (refer to Appendix 2) that can be generated by the bushfire in that vegetation. The width of each shaded contour interval (i.e. the applicable vegetation separation distances corresponding to a BAL rating) will vary and is determined by calculations involving vegetation type, fuel structure, ground slope, and climatic conditions (i.e. the expected fire behaviour). They are unique to a site and can vary across a site.

The Primary Use of BAL Contour Mapping - Planning

BAL contour mapping is primarily a planning tool that can give an overview as to the suitability of a site for development with respect to the extent to which bushfire is a potential threat to future buildings and persons on the subject land.

The mapping considers the development site (i.e. all existing or proposed lots) and does not consider the bushfire risk at an individual lot level or over different development time frames. Rather it is assessing the situation that will exist when the entire development has been completed, including any vegetation management that would reasonably be expected to take place as part of establishing buildings on the lots. On this basis, it helps decision makers determine the suitability of the proposed development for planning approval.

As a result, there will be situations where, for the purposes of planning, classifiable vegetation is not contoured (e.g. e.g. Grassland or when the assumption is made that all onsite vegetation can be removed and/or modified). However, at a specific point in time (prior to full completion of a development) this vegetation may impact on a proposed buildings BAL rating.

A Secondary Use of BAL Contour Mapping - Building

Building approval (and the issue of a building permit) requires that a BAL rating is determined for an actual building and not just a lot or a building envelope (i.e. an 'area'). Determination of this BAL rating must consider the actual location of a building within an individual lot and its separation distance from any classified vegetation at the actual time of applying for building approval. It is a site-specific assessment based on the buildings design and location at a given point in time.

This specific assessment (BAL report and BAL certificate) required for a building application cannot always be derived from an assessment that is primarily designed to inform planning decisions. As a result, there are limitations to obtaining a single BAL rating for a future building of unknown location, from a BAL contour map assessment.

Nonetheless, there are limited specific situations where the required building application information (i.e. a BAL Certificate) might be obtained quickly and cost effectively from a BAL contour map assessment. When these 'determined' BAL's can be derived is explained in Section 5.2.2 'BAL's As Indicated / Determined by the BAL Contour Map'.

Figure 3.2

BAL Contour Map

Lot 602 on Plan 73790
Kawina Street
BICKLEY

LEGEND

- Subject Area : Lot 602
- Other Lots

Proposed Building

- Class 1(a)
- Class 1(b)
- Class 6
- Class 8
- Eaves, verandah etc

Existing Building

- Class 1(a)
- Class 10(a)
- Eaves, verandah etc

Assessment Area

- Vegetation - 150m
- BAL Contour - 100m
- Asset Protection Zone (BAL 29)

Bushfire Attack Levels (Method 1)

- Vegetation edge (Indicative only)
- BAL FZ (Indicative only)
- BAL 40 (Indicative only)
- BAL 29 (Indicative only)
- BAL 19 (Indicative only)
- BAL 12.5 (Indicative only)

SCALE (A3)

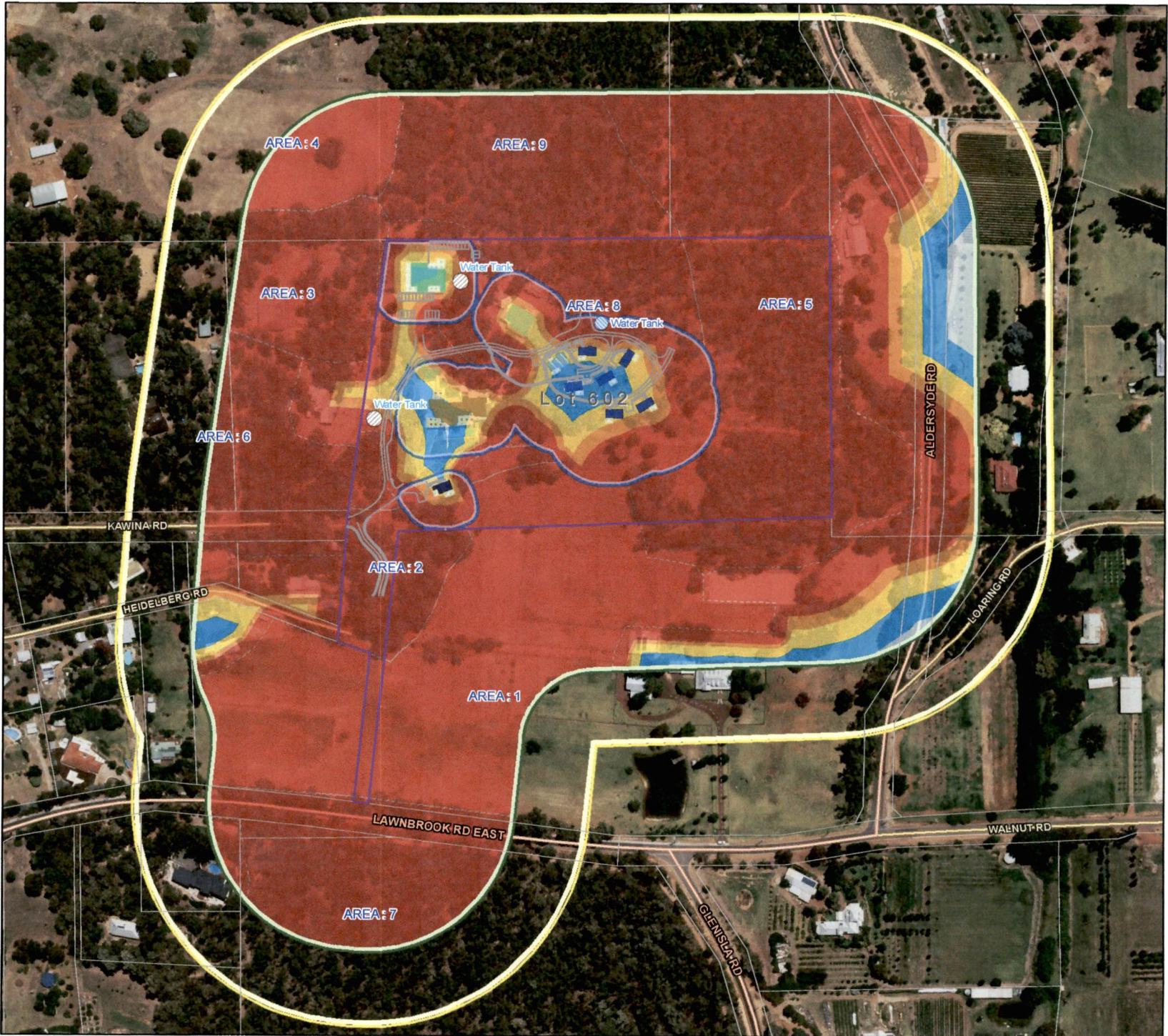
0 25 50 75 100 125 150

Metres

LOCALITY

Aerial Imagery : Landgate/SLIP
Image Date : JAN/FEB 2018

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Russell Worms
Date map compiled/updated: 6/06/2018



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Document Path: G:\BushfireProne\Mapping\MXD\170794_Lot 602 (H113) Kawina Road, Bickley_BMP_(A3L).mxd

3.2.1 Construction of the BAL Contours - Statement of Site Data and 'Separation Distance Range' Applied

For the subject site, the vegetation separation distance range that corresponds to each Bushfire Attack Level (and represented by Figure 5.2, the BAL Contour Map), has been derived from:

1. An AS3959-2009 Method 1 assessment and sourced from AS3959-2009 Table 2.4.3.

Table 5.2.1: Construction of the BAL contours

Vegetation Separation Distances Represented by the Mapped BAL Contours						
Vegetation Area	BAL Assessment Method Applied ¹	BAL Rating				
		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5
1	Method 1 (AS3959-2009 Table 2.4.3)	<9	9-<12	12-<18	18-<26	26-<50
2	Method 1 (AS3959-2009 Table 2.4.3)	<16	16-<22	22-<31	31-<43	43-<100
3	Method 1 (AS3959-2009 Table 2.4.3)	<13	13-<17	17-<25	25-<35	35-<100
4	Method 1 (AS3959-2009 Table 2.4.3)	<7	7-<9	9-<14	14-<20	20-<50
5	Method 1 (AS3959-2009 Table 2.4.3)	<33	33-<42	42-<56	56-<73	73-<100
6	Method 1 (AS3959-2009 Table 2.4.3)	<26	26-<33	33-<46	46-<61	61-<100
7	Method 1 (AS3959-2009 Table 2.4.3)	<16	16-<21	21-<31	31-<42	42-<100
8	Method 1 (AS3959-2009 Table 2.4.3)	<16	16-<21	21-<31	31-<42	42-<100
9	Method 1 (AS3959-2009 Table 2.4.3)	<20	20-<27	27-<37	37-<50	50-<100

When applying Method 1, the separation distance ranges are taken from AS 3959-2009 Table 2.4.3 using the vegetation classification and measured slope under the vegetation.

3.2.2 BAL's as Indicated / Determined by the Contour Map

Bushfire Prone Planning's Interpretation of Deriving BAL Ratings from the BAL Contour Map

Indicative BAL Ratings

If the assessed BAL for a lot or building envelope (the 'area') is stated as being 'indicative', it is because that 'area' is impacted by more than one BAL contour interval and/or classifiable vegetation remains on the lot, or on adjacent lots, that can influence a future building's BAL rating (and this vegetation may have been omitted from being contoured for planning purposes e.g. Grassland or when the assumption is made that all onsite vegetation can be removed and/or modified). In this report the indicative BAL is presented as either the highest BAL impacting the 'area' or as a range of achievable BAL's within the 'area' – whichever is the most appropriate.

The BAL rating that will apply to any future building within that 'area' will be dependent on:

1. vegetation management onsite; and/or
2. vegetation remaining on adjacent lots; and/or
3. the actual location of the future building within that 'area'.

A BAL Certificate cannot be provided for future buildings within an 'area' with an indicative BAL until the location of any future building has been determined. It usually requires an onsite visit and a BAL assessment report to be produced before the certificate can be issued.

Determined BAL Ratings

If the assessed BAL for a Lot or building envelope (the 'area') or existing building, is stated as being 'determined' it is because that 'area' or building is impacted by a single BAL contour interval. This has been determined by offsite classified vegetation, and no classifiable vegetation currently exists on the lot or on adjacent lots (i.e. it has been cleared to a minimal fuel, low bushfire threat state).

As a result, a determined BAL can be provided in this limited situation because:

1. No classified vegetation is required to be removed or modified to achieve the determined BAL, either within the lot or on adjacent lots (or if vegetation is excluded from classification, it is reasonable to assume it will be maintained in this state into the future); and
2. A future building can be located anywhere within the 'area' and be subject to the determined BAL rating; and
3. The degree of certainty is more than sufficient to allow for any small discrepancy that might occur in the mapping of the BAL contours.

A BAL Certificate (referring to the BAL Contour Map assessment) can be provided for a future building on those 'areas' assessed as having a determined BAL as long as the assessment is still valid and there is no requirement reassess the vegetation and update the contour map (this is a dependant on the time that has passed since the original assessment). Note also that a BAL Certificate will only remain valid for one year).

Once actual building locations are determined at a later planning stage, the BAL ratings for specific buildings or building envelopes may need to be determined by an onsite visit with the actual vegetation separation distances being measured.

Table 5.2.2: Proposed Buildings – Indicative BAL

Indicative Bushfire Attack Level for Proposed Buildings	
Relevant Fire Danger Index (AS3959-2009 Table 2.1)	80
BAL Determination Method	Method 1 as per AS 3959-2009 s2.2.6 and Table 2.4.3. Refer to Appendix 2 this Plan
Proposed Buildings	Indicative BAL
Chalets 1 – 6 (Class 1b)	BAL-29
Day Spa (Class 6)	BAL-29
Ancillary Accommodation (Class 1a)	BAL-29

Table 5.2.3: Existing Buildings – Indicative BAL

Indicative Bushfire Attack Level for Existing Buildings	
Relevant Fire Danger Index (AS3959-2009 Table 2.1)	80
BAL Determination Method	Method 1 as per AS 3959-2009 s2.2.6 and Table 2.4.3. Refer to Appendix 2 this Plan
Existing Buildings	Indicative BAL
Residence (Class 1a)	BAL-40
Proposed Restaurant (Class 8)	BAL-29
Workshop / Shed (Class 10a)	BAL-40

3.2.3 Identification of Specific Issues Arising from BAL Contour Map

Onsite Vegetation

Vegetation onsite is within the control of the subject site's landowner and therefore can potentially be removed or modified to lower the bushfire risk, subject to any approval being required by a local government.

For this Proposal the classified vegetation onsite (Areas 1 Class G Grassland, and Areas 5, 8 and 9 Class A Forest) can either be removed or managed to a low threat state with the limit of area being to the extent of the proposed Asset Protection Zone. This would result in the proposed buildings being subject from these areas of classified vegetation to a Bushfire Attack Level of BAL-29 (currently assessed as BAL-FZ).

Offsite Vegetation

Vegetation offsite is not within the control of the subject site's landowner and therefore the vegetation cannot be removed or modified by the landowner and as a result the assessed BAL's determined by this vegetation are unable to be reduced.

At the north-west corner of the subject lot, a 3 metre firebreak runs along the eastern boundary of the neighbouring Lot 12 and a cleared area exists on the northern abutting Lot 501. These 2 areas contribute to the achievable BAL-29 rating for the proposed restaurant (Class 8).

For other existing and proposed buildings on the lot, the establishment of the recommended Asset Protection Zones, around the buildings and within the lot boundaries, will achieve a BAL-29 rating.

4 Identification of Bushfire Hazard Issues

Assessment Results

The proposed development is bounded by forest to the north and east of varying effective slope ranging from 0° to 15°, by grassland to the south with a 10° to 15° effective slope, and by forest and woodland to the west with effective slopes ranging from 0° to 10°. The Bickley valley is located to the east of the subject site.

The Bickley valley runs in a north-south direction and is generally well managed with areas of orchards, market gardens, and grazing. To the east of Bickley valley are State Forests and native reserves.

Areas to the west of the subject site are more developed. The lot sizes are smaller with a greater proportion of maintained land.

At the north-west corner of the subject lot, a 3 metre firebreak runs along the eastern boundary of the neighbouring Lot 12 and a cleared area exists on the northern abutting Lot 501. These 2 areas contribute to the achievable BAL-29 rating for the proposed restaurant (Class 8).

For other existing and proposed buildings on the lot, the establishment of the recommended Asset Protection Zones, around the buildings and within the lot boundaries, will achieve a BAL-29 rating.

As the Day Spa will be a Class 6 building it will not be required to be constructed to a BAL construction standard. It is thus crucial that the separation distances for that building be maintained to enhance its survivability during a bushfire. BAL-29 separation distances for all proposed and existing buildings are provided in this Plan.

The three existing habitable buildings were identified as having BAL ratings ranging from BAL-29 to BAL-40. None of the three existing habitable buildings on-site have been constructed to a BAL standard. Under City of Kalamunda regulations, the house and workshop / shed will be required to have an appropriate 20m APZ installed around them, as shown in the contour map. The proposed restaurant, as part of the proposed development, will be required to maintain the separation distances required to achieve BAL-29 to remain compliant.

It is recommended that the existing buildings should be modified to comply with the construction standards corresponding to BAL-12.5 as a minimum. The primary intention of constructing to this standard is to reduce the impact of an ember attack. This may require retrofitting of certain components.

Lawnbrook Road provides safe access and egress to two different destinations. As a sealed public road it is available to all residents and the public at all times and under all weather conditions. Additional access to Kawina Road provides a back up should access to Lawnbrook Road be unavailable.

The development site has compliant firebreaks installed and these will be maintained in accordance with the City of Kalamunda annual Firebreak Notice.

The site is amply supplied with water for firefighting purposes. Reticulated water is supplied to the site and the nearest hydrant is located 300m to the west on Hill Street (near the corner with Kawina). The site also has two existing 120,000 litre water tanks, and a third is to be installed adjacent to the proposed chalets and Day Spa. Of the existing tanks the one situated on the east boundary will have appropriate couplings installed. The new water tank will be installed to meet the technical requirements for access by firefighting vehicles.

There is an outstanding requirement, created by this bushfire management plan, that before occupancy of the proposed buildings, a bushfire evacuation plan that addresses the circumstance of bushfire will be required.

5 Bushfire Risk Management Measures

5.1 The Bushfire Protection Criteria – Assessment of Compliance

State Planning Policy 3.7 Planning in Bushfire Prone Areas (Dept. of Planning and WAPC 2015) requires an assessment against the bushfire protection criteria requirements contained in the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.2 s4.5 and Appendix 4)*.

This assessment is to accompany any strategic planning proposal, subdivision application or development application.

Strategic planning proposals need to demonstrate that compliance can be achieved in subsequent planning stages. Subdivision and development applications must demonstrate compliance within the boundary of the subject site or provide justification for those criteria that are not able to be fully met.

The bushfire protection criteria are divided into four elements location, siting and design, vehicular access and water.

For each element, there is:

1. An intent stating the required outcome (overall aim);
2. A performance principle that is a general statement of how best to achieve the intent; and
3. One or more specific criteria to be addressed and for which an acceptable solution is provided as an example of one way of meeting the criteria (and therefore the elements intent).

A proposals compliance with each element is determined by either one or a combination of the following:

1. For each relevant criterion, fully meeting the requirements of the acceptable solution (which automatically achieves the intent for that criteria); and/or
2. For one or more relevant criteria, not fully meeting the requirements of the acceptable solution but achieving the requirements of the performance principle by employing a relatively minor variation on the acceptable solution; and/or
3. For one or more relevant criteria, developing an alternative solution that will achieve the performance principle.

Bushfire Prone Planning presents the required assessment against all the bushfire protection criteria as a separate table for each element and includes the intent, the performance principle and acceptable solution examples, for convenient reference.

5.2 Summary of the Assessment Outcomes

Summarised Outcome of the Assessment Against the Bushfire Protection Criteria (BPC)				
Element for which one or more applicable 'acceptable solutions' are provided	Basis for the Proposals Assessment by the Decision Maker			
	How the Intent of the Element is Achieved (or will be achieved at future planning stages)			Minor or Unavoidable Development
	Compliance with the Acceptable Solutions (currently or at future planning stages)		Performance Based Assessment	
	Complies with all applicable 'acceptable solutions'	One or more applicable 'acceptable solutions' are not <u>fully</u> met. A <u>variation</u> of the solution is provided and justified.	Alternative solution/s are developed and presented in the BMP	the required statements are presented in the BMP
Location	✓			N/A
Siting and Design of Development	✓			
Vehicular Access		✓		
Water	✓			
Notes:				

The Elements of the Criteria – Compliance with the Required Outcomes and the Acceptable Solutions

Bushfire Protection Criteria - Element 1- Location

Intent: 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.

Performance Principle P1 (to be complied with to meet the intent and used to develop alternative solutions): The intent may be achieved where the strategic planning proposal, subdivision or development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low **OR** a BAL-29 or below applies **AND** the risk can be managed. For unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of DFES and the decision-maker.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A1.1 Development Location - The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low;</p> <p>OR</p> <p>Be subject to BAL-29 or below;</p>	<p>Land is most suitable for land use intensification where hazard levels are low. Where there is an extreme bushfire hazard level or requirements for use of BAL-40 or BAL-FZ construction standards, the land is not considered suitable for development unless it meets the definition of minor or unavoidable development.</p> <p>Minor development requires local government planning approval. Unavoidable development requires demonstrating that risk can be managed to the satisfaction of DFES, WAPC and local government.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The proposed development will comply with Element 1 'Location' by meeting the requirements of the acceptable solution. These are met by:</p> <ul style="list-style-type: none"> • Being subject to BAL-29 or below (the highest indicative BAL is BAL-29). This is achieved by implementing the bushfire risk management measures of positioning, design and/or onsite vegetation modification as identified within this Plan; and • The bushfire risk being additionally managed by the present existence and/or future implementation of bushfire risk management measures that include the requirements for vehicular access, firefighting water and the ongoing maintenance of all measures as identified within this Plan.

Bushfire Protection Criteria - Element 2 - Siting and Design of Development

Intent: To ensure that the siting and design (note: not construction standard) of development minimises the level of bushfire impact.

Performance Principle P2 (to be complied with to meet the intent and used to develop alternative solutions): The intent may be achieved where the siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire risk that applies to the site. That it incorporates a defensible space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS3959 if appropriate.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:</p> <p>Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29) in all circumstances.</p> <p>Location: The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot/s will be managed in a low-fuel state on an ongoing basis, in perpetuity.</p> <p>Management: The APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' ('Guidelines' Appendix 4, Element 2 Schedule 1). Refer to Appendix 1 of this Report/Plan.</p>	<p>The APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level by reducing fuel loads (predominantly combustible vegetation).</p> <p>The required width of the APZ varies with the vegetation impacting the site and ground slopes.</p> <p>The APZ is to include a defensible space (minimum 3m width) – an area adjoining the asset in which vegetation is kept to an absolute minimum and free from combustible items and obstructions – to facilitate firefighting operations.</p> <p>Where the loss of vegetation is not acceptable or causes conflict with landscape and environmental objectives, then the development may need to be modified.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The proposed development will comply with this element of the bushfire protection criteria by fully meeting the requirements of the acceptable solution by being able to establish a minimum sized APZ that will result in the required construction standard not exceeding that corresponding to BAL-29. This will be achieved by:</p> <ul style="list-style-type: none"> • Being able to partially establish the required minimum sized APZ within the lot boundaries; • Having part of the required APZ dimensions being contributed by an area on adjoining land that is either non-vegetated or assessed as being managed in a low-fuel state and which can most reasonably be expected to be managed this way in perpetuity; • Being able to implement any minimum APZ requirements as set by the relevant local government within the lot boundaries; and • The landowner/s having the responsibility of continuing to manage the required APZ as low threat vegetation in a minimal fuel state by maintaining the APZ to the required specifications by implementing the 'Standards for APZ's' (refer to Appendix 4) and the requirements of the local government's annual firebreak notice.

Bushfire Protection Criteria - Element 3 - Vehicular Access

Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Performance Principle P3 (to be complied with to meet the intent and used to develop alternative solutions): The intent may be achieved where the internal layout, design and construction of public and private vehicular access and egress in the subdivision /development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents and the public at all times and under all weather conditions.</p>	<p>This is to apply to access routes leading into a subdivision as well as those within a subdivision. All access should accommodate type 3.4 fire appliances (4WD 7t chassis). Two-way access should be provided as a public road, however, where a public road cannot be provided (and this will need to be demonstrated by the proponent providing justification), an emergency access way may be considered.</p>	<p>Does Not Fully Comply with the Acceptable Solution but Will Achieve the Intent of the Element</p>	<p>At completion the development will have two entrances: a primary entrance onto Kawina Road and a secondary entrance onto Lawnbrook Road.</p> <p>Kawina Road provides safe access and egress to two different destinations via Hill Street and Halleendale Road. As a sealed public road, it is available to all residents and the public at all times and under all weather conditions. Access to Hill Street is available at a distance of approximately 300 metres from the proposed development. Access to Haleendale Road is available at a distance of approximately 980 metres from the proposed development.</p> <p>Lawnbrook Road provides safe access and egress to two different destinations. As a sealed public road, it is available to all residents and the public at all times and under all weather conditions.</p>

Bushfire Protection Criteria - Element 3 - Vehicular Access (continued)

Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Performance Principle P3 (to be complied with to meet the intent and used to develop alternative solutions): The intent may be achieved where the internal layout, design and construction of public and private vehicular access and egress in the subdivision /development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements (and any required action)
A3.2 Public Road Minimum trafficable surface of 6m. Constructed to meet the technical requirements stated in Appendix 4.	In special circumstances, where ≤ 8 lots serviced, a minimum 4m trafficable surface for a maximum of 90 might be approved.	N/A	No new roads are included as part of this development.
A3.3 Cul-de-sacs - (includes dead-end roads). A maximum length of 200m with a 17.5m turnaround. 600m length if cul-de-sacs services ≤ 8 lots and is joined to another cul-de-sac by an emergency access way of <600m). Constructed to meet the technical requirements stated in Appendix 4.	Should be avoided in bushfire prone areas as they do not provide access/egress in different directions. Where no alternative exists this will need to be demonstrated by the proponent including if the lot layout already exists. Cul-de-sac is to connect to a public road.	Will Fully Comply with the Acceptable Solution	No new roads are to be included as part of this development. While Kawina Road is a cul-de-sac, the installation of the proposed entrance from Lawnbrook Road, which will provide access and egress to 2 different destinations, will mitigate any issues caused by Kawina Road.
A3.4 Battle-axe Maximum length 600m, minimum width 6m, passing bays @ 200m, turnaround area @ 500m and at house site. Constructed to a minimum of private driveway standards. Constructed to meet the technical requirements stated in Appendix 4.	Should be avoided in bushfire prone areas If no alternative exists this will need to be demonstrated by the proponent.	N/A	Not applicable to this development.

Bushfire Protection Criteria - Element 3 - Vehicular Access (continued)

Acceptable Solutions	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A3.5 Private Driveways Are required where a house is >50m from a public road. Passing bays @ 200m, turnaround area @ 500m and within 50m of house. Bridges/culverts to support 15t. All weather surface. Constructed to meet the technical requirements stated in Appendix 4.</p>	<p>A private driveway will be installed from Lawnbrook Road, and to each of the chalets and day spa.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>A private driveway will be installed from Lawnbrook Road to the development site. This will be approximately 200m long and will be constructed to meet all technical requirements, with the exception of those related to gradient requirements of 1 in 10, due to the slope of the land (11°, or 18%). It will be a sealed surface to ensure it is available and safe at all times. Internal driveways will also be installed to each of the chalets and the Day Spa. These will be constructed to meet the technical requirements. This is the landowner's responsibility.</p>
<p>A3.6 Emergency Access Way Provided as a right of way or public access easement in gross (maximum length of 600m) to ensure accessibility to the public and fire services in emergencies. It should comply with minimum standards for a public road and be signposted. Constructed to meet the technical requirements stated in Appendix 4.</p>	<p>An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists, this will need to be demonstrated by the proponent. It is to be provided as an alternative link to a public road during emergencies.</p>	<p>N/A</p>	<p>Not applicable to this development.</p>
<p>A3.7 Fire Service Access Routes - (perimeter roads) Provided as rights of way or public access easements in gross; all weather surface and allow for two-way traffic; dead-end roads not permitted; turnarounds every 500m; less than 600m to a public road and be signposted. Constructed to meet the technical requirements stated in Appendix 4.</p>	<p>Fire service access routes should be established to separate bushfire prone areas from developed areas and to provide access within and around the edge of the subdivisions and related development. To be used during bushfire suppression operations and prevention work.</p>	<p>N/A</p>	<p>Not applicable to this development.</p>

Bushfire Protection Criteria - Element 3 - Vehicular Access (continued)

Acceptable Solutions	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A3.8 Firebreak Width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level prescribed in the local firebreak notice issued by the local government.</p>	<p>The development has installed compliant fire breaks around the perimeter of the lot.</p>	<p>Fully Complies with the Acceptable Solution</p>	<p>The development will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.</p>

Bushfire Protection Criteria - Element 4 – Water

Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Performance Principal P4 (to be complied with to meet the intent and used to develop alternative solutions): The intent may be achieved where the subdivision, development or land use is provided with a permanent and secure supply that is sufficient for firefighting purposes.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements (and any required action)
<p>A4.1 Reticulated Areas The subdivision, development or land use is provided with a reticulated water supply, in accordance with the specifications of the relevant water supply authority and DFES. Constructed to meet the technical requirements stated in Appendix 5.</p>	<p>The Water Corporations 'No 63 Water Reticulation Standard' is deemed to be the baseline criterion for developments and should be applied unless local water supply authorities' conditions apply. Additionally, any local government variation must be met (s8.4).</p>	<p>Fully Complies with the Acceptable Solution</p>	<p>A reticulated water supply is available in the area of the subject site. The site is located 320m from the nearest hydrant located on the corner of Hill Street and Kawina Road. This meets the technical requirements for rural hydrant spacings.</p>
<p>A4.2 Non-Reticulated Areas Water tanks for firefighting purposes with a hydrant or standpipe are provided. Minimum of 50,000l/tank; minimum 1 tank/25 lots (or part thereof); house ≤2km from a tank; 20min turnaround time for 2.4 appliance; hardstand area suitable for 3.4 appliance within 3m of tank Must meet the technical requirements stated in Appendix 5. Any local government variation must also be met (s8.4).</p>	<p>The specification of the requirements for the proposal being assessed will be set by the water supply authority and DFES. A procedure must be in place to ensure that water tanks are maintained at or above the designated capacity at all times, including home tanks on single lots. This could be in the form of an agreement with the local government and the fire service. Water tanks and associated facilities are vested in the relevant local government</p>	<p>N/A</p>	
<p>A4.3 Non-reticulated Areas (Individual Lots) Single lots above 500 m² need a dedicated static water supply on the lot that has the effective capacity of 10,000 litres. Must meet the technical requirements stated in Appendix 5.</p>	<p>A4.3 is only for use if creating one additional lot and cannot be applied cumulatively.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The site currently has two existing 120,000 litre water tanks. One of these will be fitted with couplings to allow it to be accessible to firefighting appliances. A separate 120,000 litre tank will be installed adjacent to the chalets and Day Spa. This will meet the technical requirements.</p>

5.3 Location of Buildings and Applicable BAL's

Future buildings are to be located in areas where an appropriate Bushfire Attack Level rating can be achieved and where minimal removal of valuable existing native vegetation is required to achieve this rating. The intent is to have the subject land of this Proposal located in an area where the bushfire hazard level is, or will on completion, be moderate or low or be subject to a maximum Bushfire Attack Level of BAL-29.

The proposed development is unlikely to be approved if the indicative BAL rating for future buildings is either BAL-40 or BAL-FZ as it is unacceptable on planning grounds.

The proposed location of the chalets, day spa, ancillary accommodation and restaurant will result in them being subject to BAL-29. As such they are located appropriately but the required separation distances from the classified vegetation will need to be achieved and maintained. These distances are stated in the next section of this Plan, Section 7.4 'Vegetation Management'.

5.4 Vegetation Management

Ongoing Maintenance of Assessed Vegetation

1. Where any existing or planned, re-vegetation has been assessed as “low threat” (meeting AS 3959-2009 Section 2.2.3.2 requirements) and excluded from classification then this area will be managed to continue to meet those requirements (refer to Appendix 3) and enable the buildings to retain their determined BAL ratings;
2. Any classified vegetation onsite (i.e. within a subject lot) that has directly contributed to the determined BAL rating for a given building, will be managed such as to not change that vegetation to a higher risk classification; and
3. Where a local government issues an annual firebreak notice under s33 of the Bush Fires Act 1954, this will be complied with.

Bushfire Protection Zones

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.2)* set out the requirements to create an Asset Protection Zone (APZ). The aim of these bushfire protection zones is to have a fire of diminishing intensity and flame length as it approaches the development. These reduced fuel loads will reduce the intensity of radiant heat onto the buildings, thereby increasing their survivability. This will also be important for firefighter and occupant’s safety during fire suppression activities.

Asset Protection Zone (APZ) – This is to be established, within a subject lot’s boundary such that a building will not be subject to a BAL rating greater than BAL-29.

The APZ must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning “there is insufficient fuel available to significantly increase the severity of the bushfire attack” and being “recognisable as short cropped grass for example to a nominal height of 100mm.”

Refer to Appendix 3 and Appendix 4 for specific technical requirements.

Establishing the APZ

An Asset Protection Zone (APZ) creating a low fuel area will be required to be incorporated into the landscaping surrounding current and any future buildings on the proposed lots.

Vegetation will be removed from this site to enable construction to take place. It is proposed to clear this vegetation to the extent that it achieves the minimum required separation distances from the identified areas of classified vegetation (as set out in Table 7.4.1). This will achieve a BAL rating of BAL-29 for the proposed buildings.

If certain areas of existing vegetation, within the required separation distance, are to be retained, then the vegetation must be modified to the extent that it can be excluded from classification (refer to Appendix 3) and meet the specifications of an Asset Protection Zone (APZ) which are set out in Appendix 4.

Minimum Vegetation Separation Distances

To retain the stated BAL rating of BAL-29 the separation distances from the classified vegetation to the proposed buildings will need to be maintained to at least the minimum distances shown in Table 7.4.1.

This minimum separation distance from any classified vegetation, that corresponds to the proposed building's assessed BAL will be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning "there is insufficient fuel available to significantly increase the severity of the bushfire attack" and being "recognisable as short cropped grass for example to a nominal height of 100mm." Refer to Appendix 3 of this Plan for further detail.

It is also recognised that the local government issues an annual firebreak notice under s33 of the Bush Fires Act 1954 and this will be complied with.

Ongoing Maintenance of Classified and Excluded Vegetation

Table 7.4.1: Ongoing maintenance of the separation area from any future building works to the classified vegetation (refer to Figure 5.1 for vegetation area details)

The Minimum Separation Distance Required to Retain a BAL-29 Rating						
Vegetation Area	1	2	3	5	8	9
Proposed Ancillary Accommodation (Class 1a Building) with Achievable BAL of BAL-29						
Minimum Separation Distance Required (m)	12	22	17	42	21	27
Proposed Chalets (Class 1b Buildings) with Achievable BAL of BAL-29						
Minimum Separation Distance Required (m)	12	22	17	42	21	27
Proposed Day Spa (Class 6 Building) with Achievable BAL of BAL-29						
Minimum Separation Distance Required (m)	12	22	17	42	21	27

5.5 Building Construction Standards

5.5.1 Future Habitable Buildings on the Subject Site

Building Classes 1, 2, 3 and 10a

The Building Code of Australia (BCA) contains bushfire construction requirements that are applied to residential buildings of Class 1, 2 or 3 and associated Class 10a buildings and decks. These are required by the BCA to be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire, and the intensity of the bushfire attack on the building - as quantified by the BAL rating for the development site.

The BCA references *AS3959-2009 Construction of buildings in bushfire prone areas* or the *(NASH) Standard – Steel Framed Construction in Bushfire Prone Areas* (for Class 1a and 1b buildings only) as deemed to satisfy solutions that provide one way of complying with the Building Code's bushfire performance requirements.

Note: Higher construction standards can be either applied by a planning authority or presented as a part of an alternative solution in this Plan to enable compliance with the intent of the Bushfire Protection Criteria.

Buildings Classes 4 to 9

The BCA does not require Class 4-9 buildings to meet bushfire performance requirements. However, the responsible planning authority may condition planning approval with the requirement for the building works to be designed and constructed to reduce the risk of ignition from a bushfire - or a proponent might voluntarily adopt this approach.

The required bushfire performance measures will be those necessary to reduce the potential risk of ignition caused by burning embers, radiant heat or flame generated by a bushfire, and the intensity of the bushfire attack on the building - as quantified by the assessed BAL rating for the development site.

These measures would need to be determined by a Fire Engineer (with reference to AS3959-2009), certified in working drawings and approved by the responsible authority.

This Plan has provided achievable (or indicative) BAL's rather than determined BAL's because any future building works actual location is unknown. Once actual building locations have been determined confirmation or reassessment of the BAL may be required prior to the construction of any buildings.

As the Day Spa will be a Class 6 building it will not be required to be constructed to a BAL construction standard. It is thus crucial that the separation distances for that building be maintained to enhance its survivability during a bushfire.

5.5.2 Existing Habitable Buildings on the Subject Site

Building Classes 1, 2, 3 and 10a

Class 1, 2 and 3 buildings and Class 10a associated buildings and decks, constructed prior to the requirement to comply with bushfire performance requirements, do not need to meet these requirements.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.2)* state, “The policy measures of SPP 3.7 and these Guidelines are not to be applied retrospectively” (Guidelines s2.2). Further, the WA Building Commission ‘Building in Bushfire Prone Areas’ information note states “Building standards and regulations are generally not retrospective”.

Buildings Classes 4 to 9

Buildings of Class 4 to Class 9 are not required by the Building Code of Australia (BCA) to be constructed to comply with bushfire performance requirements. Although responsible authorities may require it.

Retrospectively upgrading buildings to assist in reducing bushfire risk to persons and property is a voluntary choice.

Bushfire Prone Planning Recommendation - As the existing buildings exist in a bushfire prone area and may be subject to a bushfire attack, Bushfire Prone Planning recommends that some degree of upgrading be considered to improve the protection for occupants and the building’s survivability. At a minimum protection from ember attack should be considered (i.e. constructed to the standard required for BAL-12.5).

The three existing habitable buildings were identified in Section 5.2.2 as having BAL ratings ranging from BAL-29 to BAL-40. None of the three existing habitable buildings on-site have been constructed to a BAL standard. Under City of Kalamunda regulations, the house and workshop / shed will be required to have an appropriate 20m APZ installed around them, as shown in the contour map. The proposed restaurant, as part of the proposed development, will be required to maintain the separation distances required to achieve BAL-29 to remain compliant.

The required separation distances of buildings from classified vegetation to achieve a BAL-29 rating are set out in Table 7.7.1. Note that local government approval is likely to be required prior to removal of any significant native vegetation.

It is recommended that the existing buildings should be modified to comply with the construction standards corresponding to BAL-12.5 as a minimum. The primary intention of constructing to this standard is to reduce the impact of an ember attack. This may require retrofitting of certain components.

Table 7.7.1: Existing buildings on site – required minimum separation distance to achieve the stated BAL rating.

Existing Building No 1 (House)- Conditional BAL	Vegetation Area				
	1	2	3	6	8
Assessed separation distance (m)	12	27	55	46	13
Assessed BAL's	BAL-29	BAL-29	BAL-12.5	BAL-12.5	BAL-FZ
Conditional Building BAL	BAL-29				
Minimum required separation distance (m)	12	22	17	33	21
Is removal of vegetation required to achieve the "Conditional" BAL?	No	No	No	No	Yes

Existing Building No 2 (Proposed restaurant)- Conditional BAL	Vegetation Area				
	3	4	8	9	
Assessed separation distance (m)	17	44	8	27	
Assessed BAL's	BAL-29	BAL-12.5	BAL-FZ	BAL-29	-
Conditional Building BAL	BAL-29				
Minimum required separation distance (m)	17	9	21	27	
Is removal of vegetation required to achieve the "Conditional" BAL?	No	No	Yes	No	-

Existing Building No 1 (Workshop / Shed)- Conditional BAL	Vegetation Area				
	8	9			
Assessed separation distance (m)	12	14			
Assessed BAL's	BAL-FZ	BAL-FZ	-	-	-
Conditional Building BAL	BAL-29				
Minimum required separation distance (m)	21	27			
Is removal of vegetation required to achieve the "Conditional" BAL?	Yes	Yes	-	-	-

Important:

- 1. A conditional BAL lower than BAL-29 will not be given if it requires the removal of native vegetation which would require the approval of the local government.*
 - 2. The area of land representing the above minimum separation distance must be maintained as either a non-vegetated area or as low threat vegetation managed to a minimal fuel condition (i.e. insufficient fuel available to significantly increase the severity of the bushfire attack e.g. short cropped grass to nominal height of 100mm) as per AS 3959-2009 s2.2.3.2. Refer to Appendix 3.*
 - 3. It is the responsibility of the landowner to maintain the bushfire protection measures on their property. This includes the vegetation separation distance, the asset protection zone and hazard separation zone (Appendix 4) and compliance with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.*
-

6 Responsibilities for Implementation and Management of the Bushfire Protection Measures

6.1 Implementation Responsibilities Established by the BMP

This section sets out the responsibilities of landowners/proponents (including future landowners), builders and local government in relation to the implementation and maintenance of the requirements of SPP 3.7 and the 'Guidelines'.

Table 6.1.1: Developer BMP implementation responsibilities.

DEVELOPER			
No.	Implementation Action	Timing	Development Clearance
1	Install the private driveways to the standards stated in the BMP.	To support the development application.	<input type="checkbox"/>
2	Install the reticulated water supply, if required, to the standards stated in the BMP. This will be as per the Water Corporation requirements unless otherwise agreed.	To support the development application.	<input type="checkbox"/>
3	Install the required non-reticulated water supply to the standards stated in the BMP - as endorsed by the relevant decision maker.	To support the development application.	<input type="checkbox"/>
4	<p>The local government may condition a development application approval with a requirement for the landowner/proponent to register a notification onto the certificate of title (it may also need to be included on the deposited plan).</p> <p>This will be done pursuant to Section 70A Transfer of Land Act 1893 as amended ('Factors affecting use and enjoyment of land, notification on title:'). This is to give notice of the bushfire hazard and any restrictions and/or protective measures required to be maintained at the owner's cost.</p> <p>This condition ensures that:</p> <ol style="list-style-type: none"> 1. Landowners/proponents are aware their lot is in a designated bushfire prone area and of their obligations to apply the stated bushfire risk management measures; and 2. Potential purchasers are alerted to the Bushfire Management Plan so that future landowners/proponents 	Prior to Occupancy	<input type="checkbox"/>

	can continue to apply the bushfire risk management measures that have been established in the Plan.		
5	Establish the Asset Protection Zones (APZ) for the development to the dimensions and standards stated in the BMP.	To support the development application.	<input type="checkbox"/>
6	There is an outstanding obligation, created by this bushfire management plan, for a bushfire emergency response plan for proposed residents to be prepared for a 'vulnerable' land use.	To support the development application.	<input type="checkbox"/>
7	The entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).	To support the development application.	<input type="checkbox"/>

Table 6.1.2: Landowner BMP implementation responsibilities.

LANDOWNER		
No.	Implementation Action	Timing
1	Inform any builders of proposed structures on the Lot of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to the determined BAL rating.	Prior to any building work
2	Establish the Asset Protection Zone (APZ) to the dimensions and standard stated in the BMP.	Prior to occupancy
3	Install the required emergency water supply (tank within the lot) that meets construction and vehicle access specifications.	Prior to occupancy

Table 6.1.3: Landowner BMP implementation responsibilities.

BUILDER		
No.	Implementation Action	Timing
1	Be aware of the existence of any BMP that refers to the subject Site.	Prior to any building work
2	The builder (generally named on the building permit) is responsible for ensuring that the building or incidental structure to which a building permit applies will be compliant on completion with the bushfire provisions of the Building Code of Australia (BCA) as it applies in WA.	Prior to any building work

6.2 Management Responsibilities Established by the BMP

Table 6.2.1: Landowner/Occupier management responsibilities.

LANDOWNER/OCCUPIER		
No.	Management Action	Timing
1	Maintain the Asset Protection Zone (APZ) to the dimensions and standard stated in the BMP.	Ongoing
2	Comply with the City of Kalamunda Fire break and Fuel Load Notice issued under s33 of the Bush Fires Act 1954.	Ongoing
3	Maintain vehicular access routes within the lot to the required surface condition and clearances as stated in the BMP.	Ongoing
4	Maintain the emergency water supply tank at or above designated capacity at all times and maintain its associated fittings and vehicular access in good working condition.	Ongoing
5	Ensure that any builders (of future structures on the Lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to the determined BAL rating.	Ongoing
6	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: (a) the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and (b) with any identified additional requirements established by this BMP or the relevant local government. Refer to Section 7.7 'Building Construction Standards'	Ongoing
7	Updating the Bushfire Management Plan may be required to ensure that the bushfire risk management measures remain effective. Bushfire plans do not expire and should be a 'living document'. Updating is required in certain circumstances, including (but not limited to) if site conditions change, if further details are required at subsequent stages of the planning process or to reflect new technologies or methodologies in best practice bushfire risk management ('Guidelines' s4.6.4 and s4.6.5).	Ongoing

Table 6.2.2: Local Government management responsibilities

LOCAL GOVERNMENT		
No.	Management Action	Timing
1	Monitor landowner compliance with the annual firebreak notice.	Ongoing
2	Develop and maintain district bushfire fighting services and facilities.	Ongoing

7 Specific Land Uses

State Planning Policy 3.7 Planning in Bushfire Prone Areas (Department of Planning and WAPC 2015) sets out in policy measure 6.6 what is required for ‘vulnerable’ or ‘high risk’ land uses to be supported in bushfire prone areas subject to BAL-12.5 or higher.

7.1 Vulnerable Land-Use – Definition / Application / Requirements

Is this Bushfire Management Plan (BMP) to accompany a development application for building work associated with a land use that is considered a ‘vulnerable’ land use?	Yes
Is a Bushfire Evacuation Plan for Proposed Occupants to be provided as a separate document and be considered as forming a part of this Bushfire Management Plan?	Yes
Is the required content of a Bushfire Evacuation Plan for Proposed Occupants to be provided as an addition to the proponents existing emergency evacuation plan?	No
In certain circumstances the required information to fully compile the Bushfire Evacuation Plan (e.g. position, names and contact numbers for responsible persons) is not available at the development application stage. In such a situation the responsibility to complete the required details prior to occupancy of the subject building will noted in the Landowner/Proponent Responsibilities section of this BMP. Does this situation apply to this application?	No

Information reference: SPP 3.7 *Planning in Bushfire Prone Areas* (Department of Planning and WAPC 2015 s6.6 and s7) and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017 V1.2 s5.5):

Definition and Application

SPP 3.7 defines vulnerable land use as a land use where persons may be less able to respond in a bushfire emergency. The ‘Guidelines expand this and state that vulnerable uses of land are typically those that are considered to have occupants with a lesser capacity to respond in the event of a bushfire and that may present evacuation challenges.

The intent of the policy measure “is to recognise that such sites require special consideration when located in bushfire prone areas. This will ensure that bushfire risk management is sufficiently addressed in the planning assessment of these land uses”.

Examples of ‘vulnerable’ land uses include (but are not limited to) hospitals, nursing homes and retirement villages, tourist accommodation including camping grounds and ecotourism, childcare centres, educational establishments and corrective institutions. The definition may also encompass places of assembly, retail and office premises, as well as subsidiary uses of residential development, such as family day care centres or home businesses, and essential infrastructure such as energy, transport, telecommunications and other utilities.

In general, terms the following scenarios might need to be considered as vulnerable land uses:

- a. Where persons are present that have a lesser physical/mental capacity to respond to emergencies;
- b. Where occupancy is transient in nature;
- c. Where greater numbers of persons may be present at certain times;
- d. Where occupants are typically not fully familiar with the building or area.

Required Information

1. In areas where BAL12.5 - BAL29 applies, a subdivision or development application will not be supported unless it is accompanied by a Bushfire Management Plan (BMP) jointly endorsed by the relevant local government and the State authority for emergency services;
2. The BMP is to include an assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the development site.
3. Subdivision applications are to make provision for emergency evacuation;
4. Development applications should include a bushfire evacuation plan for proposed occupants; and
5. Where BAL-40 or BAL-FZ applies, applications will not be supported unless they meet the definition of 'minor' or 'unavoidable' development.

8 References

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9 Appendices – Advisory Information Only

Appendix 1

The WA Framework for Bushfire Risk Management

This section of the Bushfire Management Plan sets out the applicable legislation, regulations, policies, guidelines, documents, and associated bushfire risk assessments that a Bushfire Management Plan will need to reference and where applicable, comply with. Statements of compliance against these requirements, as required by the 'Guidelines', are presented in Section 8 of this Plan.

The state government of WA has committed to addressing bushfire through the implementation of a risk-based system of land-use planning and development that aims to reduce the risk of bushfire. The legislative means of facilitating this is through the **Planning and Development Act 2005** and its interaction with the **Fire and Emergency Services Act 1998** and the **Building Act 2011**.

Planning and Development (Local Planning Schemes) Amendment Regulations 2015

These regulations are given effect under the **Planning and Development Act 2005**. The *Planning and Development (Local Planning Schemes) Regulations 2015* are amended to introduce 'Schedule 2 Part 10A 'Bushfire Risk Management' which establishes the *deemed provisions relating to bushfire risk management*.

"The deemed provisions relating to bushfire risk management work with the State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7) and Guidelines for Planning in Bushfire Prone Areas (Guidelines); Map of Bushfire Prone Areas; Building Regulations 2012 and Building Code of Australia to guide planning and development proposals in bushfire prone areas to ensure bushfire risk is properly managed.

The deemed provisions provide a mechanism to require a development approval, and through this the application of SPP 3.7 and the Guidelines, to development on sites where BAL-40 or BAL-Flame Zone (FZ) applies. SPP 3.7 sets out the planning hierarchy and the information required at each stage of the planning process whilst the Guidelines provide information on how SPP 3.7 should be implemented" (source: WAPC Planning Bulletin 111/2015 Planning in Bushfire Prone Areas).

The **deemed bushfire provisions**:

- Only apply to development that is proposed on a site in a designated bushfire prone area.
- Override any existing local planning scheme provisions relating to bushfire, including any inconsistent provisions, apart from special control areas.
- Are in addition to any provisions relating to development in a bushfire prone area that apply to a special control area.
- Can be supplemented by a local planning scheme (by implementing a special control area) but not varied or exempted.

- Are applied and work through the following legislation, regulations, policies, guidelines, and documents – each of which this Bushfire Management Plan will address.

Map of Bushfire Prone Areas

The Map of Bushfire Prone Areas identifies land that has been designated as being bushfire prone by the Fire and Emergency Services Commissioner under the *Fire and Emergency Services (Bushfire Prone Areas) Order 2015* as part of the ***Fire and Emergency Services Act 1998***.

Designation as a bushfire prone area (highlighted as pink on the map) reflects the potential of bushfire to affect that site. It acts as a mechanism for initiating further assessment in the planning and building process. This can involve bushfire risk assessment and management measures being required in planning submissions and activation of the bushfire construction requirements of the Building Code of Australia.

State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)

This policy is made under the ***Planning and Development Act 2005*** and provides the foundation for land use planning to address bushfire risk management in Western Australia.

SPP 3.7 applies to every stage of the planning process (i.e. all higher order strategic planning documents; strategic planning proposals; subdivision and development applications) in designated bushfire prone areas. It also applies to an area not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard (*Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2 s3.2.2*).

The objectives of this policy are to:

- Ensure that all stages of land use planning (higher order strategic planning documents; strategic planning proposals; subdivision and development applications) identify and consider bushfire risk and apply specified bushfire protection measures; and
- To have an outcome that will avoid any increase in the threat of bushfire to people, property and infrastructure, preserve life and achieve an appropriate balance between bushfire risk management measures and all environmental conservation aspects.

Policy measures to achieve the objectives are defined and:

- They vary according to the type and scale of the planning proposal and stage of the development process;
- They set out the information to be prepared for each type of proposal; and
- They refer to the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.2)* as supporting this policy and providing the procedural detail for assessment and presentation of the required information.

Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.2 as amended)

These Guidelines are designed to supplement and assist in the interpretation of SPP3.7's objectives and policy measures. They provide advice on how bushfire risk is to be addressed when planning, designing or assessing a planning proposal.

As an endorsed standard (by the Office of Bushfire Risk Management), these Guidelines, in conjunction with SPP 3.7, are the predominant documents in the State for use by decision making authorities and referral agencies, during the consideration of strategic planning proposals, subdivisions and development applications.

The Guidelines set out the interrelationships between, and requirements for, various assessment tools used to assess risk in the planning context, as prescribed by SPP 3.7. These include:

- A Bushfire Hazard Level assessment;
- A Bushfire Attack Level (BAL) Contour Map;
- A Bushfire Attack Level (BAL) assessment;
- The Bushfire Protection Criteria; and
- A Bushfire Management Plan

The 'Guidelines' reference the Bushfire Attack Level descriptions and assessment methodologies that are defined in AS 3959.

Bushfire Protection Criteria

The bushfire protection criteria (set out in the 'Guidelines Appendix 4) are a performance based system of assessing bushfire risk management measures. An assessment against the criteria is to be undertaken for any strategic planning proposal, subdivision and development application for a site that has or will on completion, have a bushfire hazard level above 'Low or a BAL rating above BAL-LOW.

The protection criteria consist of four elements: Location; Siting and Design of Development; Vehicular Access; and Water.

Each element has three components: Intent; Acceptable Solutions; and a Performance Principle. How to apply the Criteria is set out in the 'Guidelines' s4.5.2.

Local Variations to Bushfire Protection Criteria

Local governments may seek to add or to modify the acceptable solutions to recognise special local or regional circumstances (e.g. topography / vegetation / climate which reinforce the intent of a particular bushfire protection element and apply across a defined locality.

These endorsed (by WAPC and DFES) variations will be in the form of a local planning scheme amendment /provision or special control area. Currently they may be in the form of a local planning policy.

WA Building Regulations 2012

These regulations exist under the **WA Building Act 2011** and adopt the **Building Code of Australia** as the minimum technical requirements for the design and construction of buildings and certain other structures in WA.

Most development in WA requires a building permit before construction can commence. This process typically occurs after the planning process.

The Regulations include the **Building Amendment Regulations (No.3) 2015** that prescribe applicable building standards for buildings located in areas designated by the Fire and Emergency Services Commissioner as bushfire prone areas (identified on the Map of Bushfire Prone Areas).

Building Code of Australia (BCA)

The BCA provides minimum technical requirements for the construction of buildings. These are presented as Volumes One and Two of the National Construction Code series.

The BCA requires an assessment of the potential intensity of bushfire attack for specific classes of residential buildings located in designated bushfire prone areas (Classes 1a, 1b, 2, 3 and associated 10a buildings or decks).

The BCA requires that these buildings are constructed to the requirements corresponding to their bushfire attack level rating.

Compliance with BCA bushfire requirements for Class 1a and 1b buildings in designated bushfire prone areas can be demonstrated by compliance with:

- a. Australian Standard *AS 3959 Construction of buildings in bushfire prone areas*; or
- b. National Association of Steel Housing – (NASH) *Standard – Steel Framed Construction in Bushfire Prone Areas*.

Compliance with BCA bushfire requirements for Classes 2, 3 and associated 10a buildings or decks in designated bushfire prone areas can be demonstrated by compliance with:

- a. Australian Standard *AS 3959 Construction of buildings in bushfire prone areas*.

AS 3959 Construction of Buildings in Bushfire Prone Areas (2009 as amended)

The objective of this Standard is to prescribe construction details for buildings to reduce the risk of ignition from a bushfire, appropriate to the:

- a) Potential for ignition caused by embers, radiant heat or flame generated by a bushfire; and
- b) Intensity of the bushfire attack on the building.

To achieve this, the Standard defines six categories of Bushfire Attack Level (BAL), details their assessment methodology and specifies constructions standards corresponding to each.

Western Australia Bush Fires Act 1954 (as amended)

'An Act to make better provision for diminishing the dangers resulting from bush fires, for the prevention, control and extinguishment of bush fires'. Matters addressed in the Act include prohibited burning times, total fire bans, bushfire control and extinguishment

The Act sets out the authority given to local government which enables them to:

- Control and extinguish bushfires
- Establish and maintain Bushfire Brigades
- Require landowners and/or occupiers to install and maintain firebreaks to their required specifications
- Require landowners and/or occupiers manage bushfire fuel loads upon the land to their required specifications

The applicable document is the annually issued **Firebreak Notice** published by the relevant local government that sets out the obligations for landowners and/or occupiers.

Other Applicable Local Government Documents

These may include:

- Local planning scheme provisions.
- Local planning strategy references to bushfire risk management.
- Local planning strategy references to environment.
- Applicable structure plans
- Special control area provisions
- Previous planning approvals

Other Documents

These may include:

- Any existing Bushfire Management Plan, Bushfire Hazard Level assessment or BAL assessment prepared over the site.
- Relevant landscaping plans applicable to the subject site.

Appendix 2

Bushfire Risk Assessment – Understanding the Methodology

In SPP 3.7 ‘bushfire risk’ is defined as “the chance of a bushfire igniting, spreading and causing damage to people, property and infrastructure.”

“Before a strategic planning proposal, subdivision or development application can be considered, it is necessary to understand the extent of the bushfire hazard and its potential to affect people, property and infrastructure. An assessment of bushfire risk is a key component of deciding whether a strategic planning proposal, subdivision or development application should be approved in an area with a potential bushfire threat (from the ‘Guidelines’).”

Policy measures in *SPP 3.7* (and the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2*) prescribe the various assessment tools to be used to assess bushfire risk in the planning context. These are:

- Bushfire Hazard Level assessment;
- Bushfire Attack Level (BAL) Contour Map;
- Bushfire Attack Level (BAL) assessment;
- Bushfire protection criteria; and
- Bushfire Management Plan

The intent of this Appendix ‘Bushfire Risk Assessment – Understanding the Methodology’ is to provide an overview of the methodology used in assessing the Bushfire Hazard Level and the Bushfire Attack Level.

Bushfire Hazard Level Assessment Methodology

Used at a strategic planning level, this methodology rates bushfire hazards into three potential categories of low, moderate and extreme by considering the following characteristics:

- Vegetation types and areas
- Effective ground slope under the vegetation threat
- Existing land use on and around the area being assessed
- Prevailing climatic conditions when appropriate

These results are presented as a Bushfire Hazard Level Map.

Bushfire Attack Level Assessment Methodology

The Australian Standard AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* defines a Bushfire Attack Level (BAL) as:

“A means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.”

AS 3959-2009 defines six categories of Bushfire Attack Level (BAL) (AS 3959 Appendix G); provides the assessment methodology (AS 3959 s2 and Appendix B); and specifies constructions standards corresponding to each BAL (AS 3959 s3 Table 3.1). The BAL’s and corresponding descriptions of the predicted levels of exposure and heat flux exposure thresholds are contained in the table on the following page.

AS 3959-2009 provides two methods to calculate Bushfire Attack Levels:

1. Method 1 - a simplified procedure that involves five procedural steps to determine the BAL. It is subject to some limitations of the circumstances in which it can be used.
2. Method 2 - a detailed procedure using calculations to determine BALs where a more specific result is sought or site conditions are outside the scope of Method 1. In particular, the use of Method 2 is to apply if the effective slope under the classified vegetation is greater than 20⁰ down slope (and no more than 30⁰ down slope) and the slope of the land between the site and the classified vegetation is no more than 20⁰ regardless of slope type.

Method 1 – Summarised Procedure

- Determination of the area to be assessed
- Determine predominant vegetation type(s) within 150 metres of the site and classify
- Determination of distance of the site, building or building envelop from the classified vegetation type(s)
- Determination of the effective slope under the classified vegetation type(s)
- Determination of BAL’s - Forest Fire Danger Index (FFDI) of 80 is used for WA

Separation Distance: *The distance from a subject site (or building) to a specific area of classified vegetation (i.e. the bushfire threat) is labelled in the tables of this Plan as a separation distance. This distance is measured to a point in the vegetation area represented by the “edge of the vegetation” as per AS 3959 -2009 s2.2.4 and the “base of the bushfire prone vegetation (not the canopy)” as per the BAL Assessment [Basic] Factsheet Version 1 December 2015 WAPC. The exact point of measurement is then decided by the assessor on the basis of the fuel structure and expected fire behaviour. If a precautionary approach is considered appropriate to a given situation the measurement will be taken at the canopy line.*

Bushfire Attack Level Definitions and Corresponding Sections Specifying Construction Requirements (Source: AS 3959-2009, Appendix G and Table 3.1)

Bushfire Attack Level (BAL)	Description of Predicted Bushfire Attack and Levels of Heat Flux Exposure	Construction Section of AS 3959
BAL - LOW	There is insufficient risk to warrant specific construction requirements but there is still some risk. There is risk of ember attack.	4
BAL - 12.5	The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/m ²	3 and 5
BAL - 19	There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m ²	3 and 6
BAL - 29	There is an increased risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m ²	3 and 7
BAL - 40	There is a much increased risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/m ²	3 and 8
BAL - FZ	There is an extremely high risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m ²	3 and 9



Appendix 3

Vegetation Classification Exclusions (AS 3959-2009 s2.2.3.2)

Certain vegetation can be excluded from being classified in which case the Bushfire Attack Level shall be rated as BAL-LOW and no bushfire specific construction requirements apply. Such vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100m from the site.
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site or each other.
- d) Strips of vegetation less than 20m in width regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings, and rocky outcrops.
- f) Low threat vegetation, including grassland managed in a **minimal fuel condition** (i.e. insufficient fuel available to significantly increase the severity of a bushfire attack – recognisable as short cropped grass to a nominal height of 100mm for example), maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

Appendix 4

Explaining Asset Protection Zones (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation. For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

(For subdivision planning, hazard separation in the form of using subdivision design elements or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot).

Defendable Space: The APZ includes a defendable space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defendable space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defendable space is dependent on the space which is available on the property, but as a minimum should be 3 metres.

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

Native Vegetation: APZ's can adversely affect the retention of native vegetation. Where the loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, such as waterway foreshore areas and wetland buffers, reducing lot yield may be necessary to minimise the removal and modification of remnant vegetation.

Responsibility: It is the responsibility of the landowner/proponent to maintain their APZ in accordance with the 'Guidelines' Appendix 4 Schedule 1 'Standards for Asset Protection Zones' (WAPC 2017). It is likely that this requirement is also contained in the firebreak notice issued by the relevant local government under s33 of the Bushfire Act 1954 along with any additional requirements.

Source: Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.2) Appendix 4 Element 2

Standards for Asset Protection Zones

(‘Guidelines’ WAPC 2017 v1.2 Appendix 4 Schedule 1)

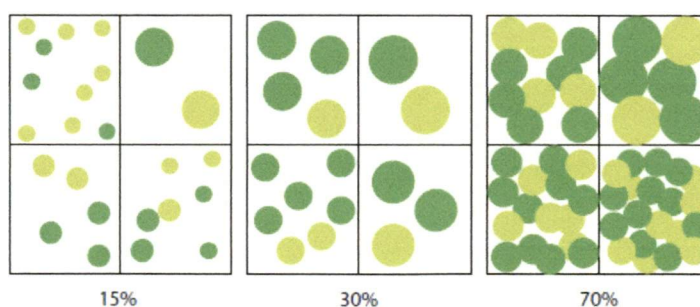
Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.

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 mm in thickness reduced to and maintained at an average of two tonnes per hectare. The visual guide below shows a fuel load that equates to approximately 2t/ha (source: Shire of Augusta Margaret River’s Firebreak and Fuel Reduction Hazard Notice).



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. Diagram below represents tree canopy cover at maturity.



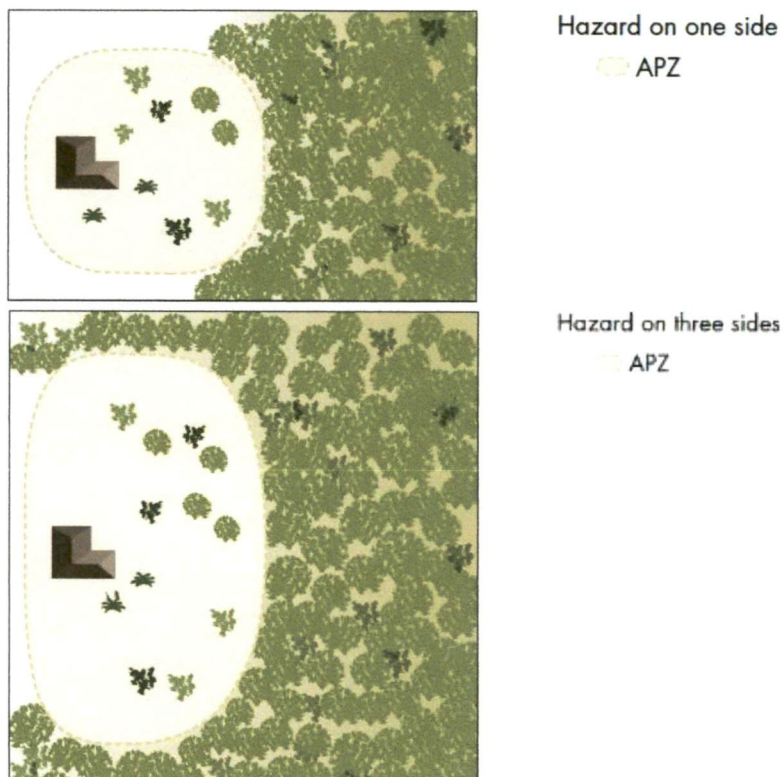
Shrubs (0.5 metres to 5 metres in height): should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres 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 mm 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 mm or less.

Note that individual local governments may set their APZ standards with additional requirements compared to the standard set in the 'Guidelines'. These will be contained in their annual firebreak notice issued under s33 of the Bushfires Act 1954 and are to be complied with.

The example diagrams below illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation



Additional DFES Guidance

- a) Store firewood at least 20 metres away from the building.
- b) Keep gutters free of leaves and other combustible material.
- c) Roof mounted evaporative coolers to be fitted with ember screens.
- d) Gas cylinders to vent away from a building and be tethered to prevent falling over.
- e) Driveways and access ways must allow for safe passage of a fire appliance to all buildings on the land.
- f) Land owners/occupiers must maintain compliance with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

Appendix 5

Technical Requirements - Bushfire Protection Criteria (Vehicular Access)

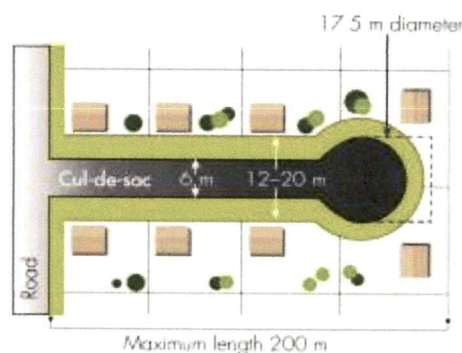
Vehicular Access – Technical Requirements of Acceptable Solutions - Part 1

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2*

Acceptable Solution 3.3 Cul-de-sacs (including a dead-end road)

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

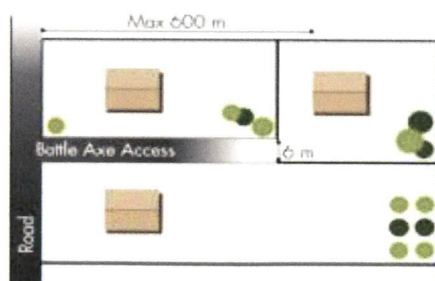
- Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length;
- Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely;
- The cul-de-sac connects to a public road that allows for travel in two directions; and
- Meet the additional design requirements set out in Part 2 of this appendix.



Acceptable Solution 3.4 Battle-axe

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

- Maximum length 600m and minimum width 6m; and
- Comply with minimum standards for private driveways.



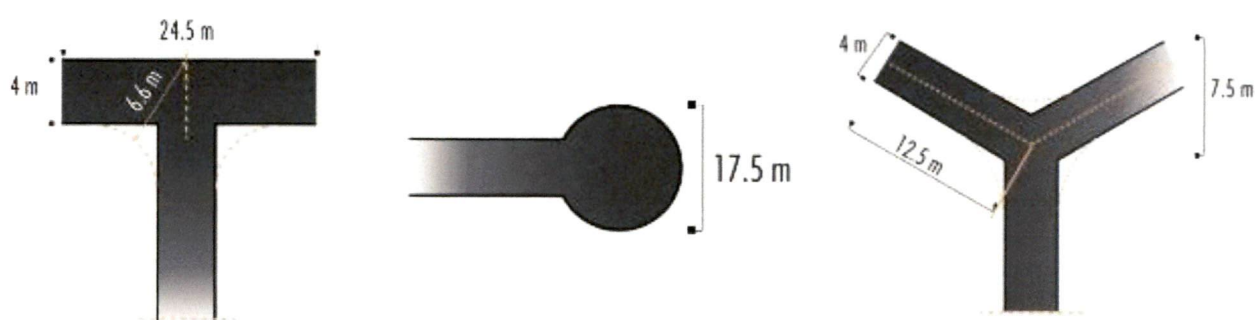
Acceptable Solution 3.5 Private Driveways

The following requirements are to be achieved:

- The design requirements set out in Part 2 of this appendix; and

Where the house site is more than 50 metres from a public road:

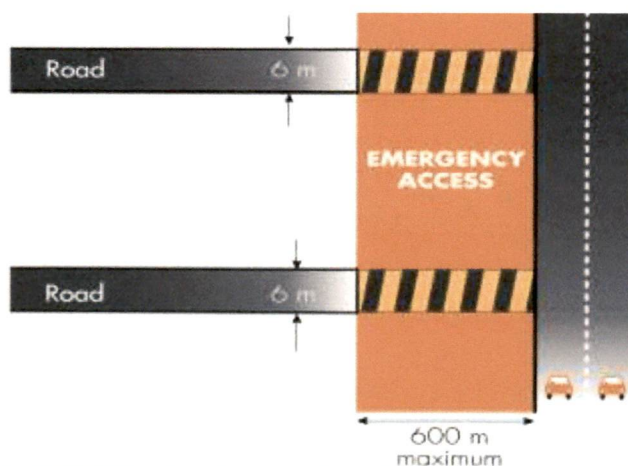
- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres);
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes; and
- All weather surface (i.e. compacted gravel, limestone or sealed).



Acceptable Solution 3.6 Emergency Access Way

An access way that does not provide through access to a public road is to be avoided bushfire prone areas. Where no alternative exists, an emergency access way is to be provided as an alternative link to a public road during emergencies. The following requirements are to be achieved:

- No further than 600 metres from a public road;
- Must be signposted including where they ajoin public roads;
- Provided as a right of way or public access easement in gross;
- Where gates are used they must not be locked and they must be a minimum width of 3.6 metres with design and construction approved by local government (refer to the example in this appendix); and
- Meet the additional design requirements set out in Part 2 of this appendix.



Acceptable Solution 3.7 Fire Service Access Routes (Perimeter Roads)

Are to be established to provide access within and around the edge of subdivision and related development and to provide direct access to bushfire prone areas for firefighters and link between public road networks for firefighting purposes. Fire service access is used during bushfire suppression activities but can also be used for fire prevention work. The following requirements are to be achieved:

- No further than 600 metres from a public road (driveways may be used as part of the designated fire service access);
- Dead end roads not permitted;
- Allow for two-way traffic (i.e. two 3.4 fire appliances);
- Provide turn-around areas designed to accommodate 3.4 fire appliances and to enable them to turn around safely every 500m (i.e. kerb to kerb 17.5 metres);
- All weather surface (i.e. compacted gravel, limestone or sealed) and have erosion control measures in place;
- Must be adequately sign posted;
- Where gates are used they must be a minimum width of 3.6 metres with design and construction approved by local government (refer to the example in this appendix) and may be locked (use a common key system);
- Meet the additional design requirements set out in Part 2 of this appendix;
- Provided as right of ways or public access easements in gross; and
- Management and access arrangements to be documented and in place.

A3.8 Firebreak Width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three meters or to the level as prescribed in the local firebreak notice issued by the local government.

Vehicular Access - Technical Requirements of Acceptable Solutions - Part 2

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2*

Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	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	4.5	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 cross-fall	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

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

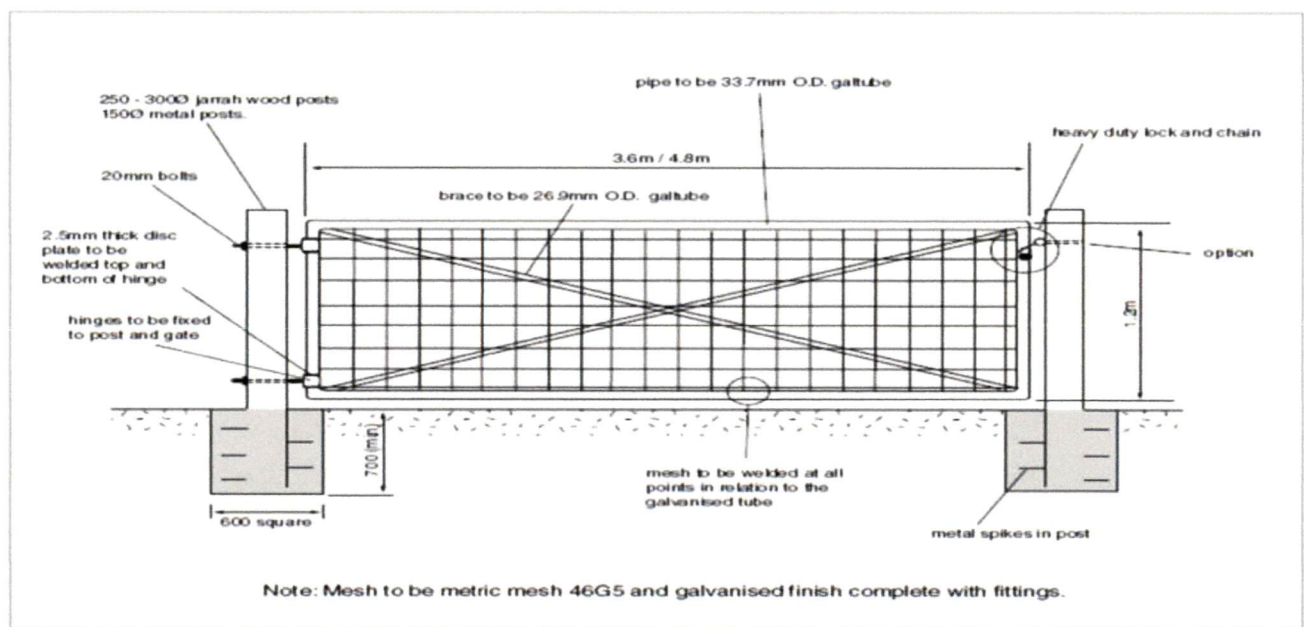
Vehicular Access - Technical Requirements of Acceptable Solutions

Gates and Signs

(example requirements – check with local government)

Gates (Bollards)

- Minimum width 3.6m
- Design and construction to be approved by relevant local government.
- Emergency access way gates must not be locked.
- Fire service access route gates may be locked but only with a common key that is available to local fire service personnel.
- Bollards will be to the relevant local government specifications



Signs

- Minimum height above ground of 0.9m.
- Lettering height to be 100mm.
- To display the words (as appropriate) “Emergency Access Only” or “Fire Service Access – No Public Access”.
- Design and construction to be approved by the relevant local government.
- Size 600mm x 400mm.
- Sign colour red, base (white) area is reflective background.
- Rounded corners, radius 20mm.
- White key-line 3mm wide, 3mm from outside edge.
- Suggested mounting hole six 6mm diameter.



Appendix 6

Technical Requirements - Bushfire Protection Criteria (Water)

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2* and DFES website

Acceptable Solution 4.1 Reticulated Areas

The requirement is to supply a reticulated water supply, together with fire hydrants, in accordance with the specifications set by DFES and the relevant water supply authority (WA Water Corporation or Aqwest - Bunbury or Busselton Water). The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply. Key specifications in the most recent version/revision of the design standard include:

- **Residential Standard** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- **Commercial Standard** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- **Rural Residential Standard** – where minimum site areas per dwelling is 10,000 m² (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

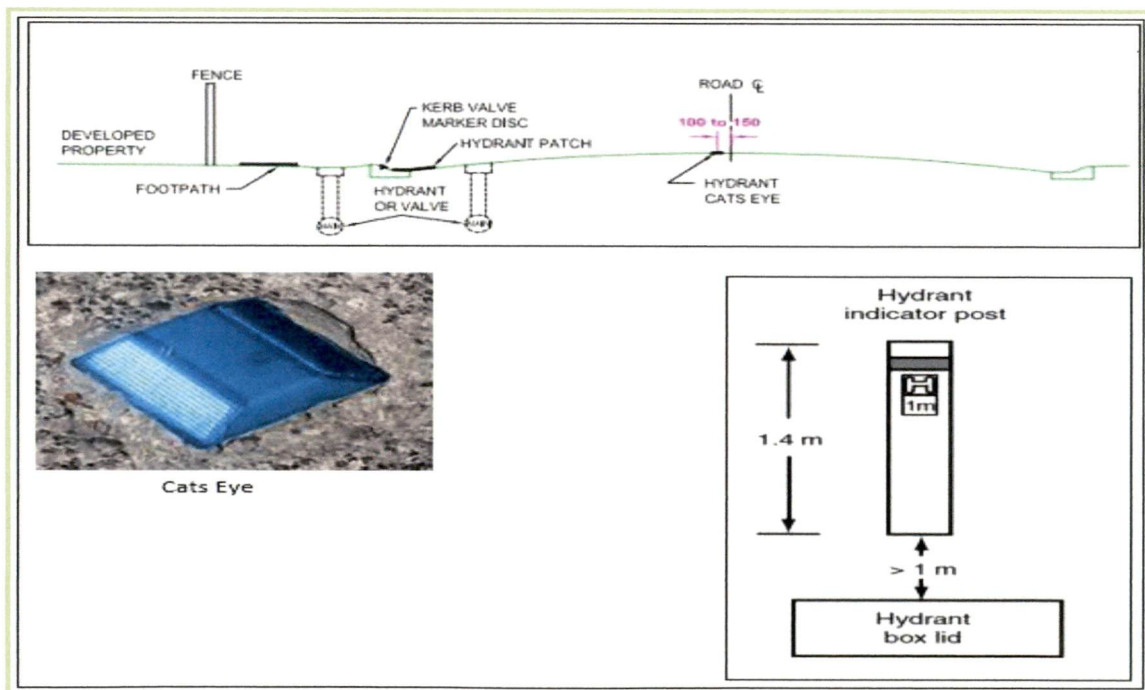


Figure A4.1: Hydrant Location and Identification Specifications

Acceptable Solution 4.2 Non-Reticulated Areas

Static water supplies are used by firefighters in areas where there is no reticulated water supply. Water tanks are the only acceptable static water source acceptable to meet Element 4 (Water) of the Bushfire Protection Criteria as per the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.2) Appendix 4*.

The requirements for the development being assessed can be increased by the relevant local government. If a variation applies it will be noted in s7.1 and s7.5.

Volume:	50,000 litres per tank
Ratio of tanks to lots:	1 tank per 25 lots (or part thereof)
Location:	No more than two kilometres to the furthestmost house site within the residential development to allow a 2.4 fire appliance to achieve a 20-minute turnaround time at legal road speeds.
Tank Construction:	Above ground tanks constructed using concrete or metal. Stands of raised tanks are constructed using non-combustible materials and heat shielding where applicable (required for metal stands).
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround areas suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) are provided within three metres of each tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 100mm cam-lock coupling of metal/alloy construction (source: DFES). Examples below:



Ownership and Responsibility:	Water tanks and associated facilities are vested in the relevant local government. A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times.
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Acceptable Solution 4.3 Non-Reticulated Areas - Individual Lots

This solution is only for use if creating one additional lot and cannot be applied cumulatively (Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2 Appendix 4).

Single lots above 500 m² need a dedicated static water supply on the lot that has an effective capacity of 10,000 litres (Guidelines for Planning in Bushfire Prone Areas WAPC 2017 V1.2).

An Example Local Government Requirement:

Volume:	Minimum 10,000 litres (effective) per tank dedicated to firefighting purposes. The storage tank must not facilitate sharing the water for domestic use (danger of contamination).
Tank Construction:	Above ground tanks constructed using concrete or metal.
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround area suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) is provided at the tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 50mm or 100mm cam-lock coupling of metal/alloy construction. Examples below:
Responsibility:	A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times.



Recommended coupling
50mm

