Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lots 624 and 625 Marshall Road, Bennett Springs

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 28th Month March Year 2020

Report author or reviewer: Kathy Nastov

WA BPAD accreditation level (please circle):

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

If accredited please provide the following.

BPAD accreditation number: 27794 Accreditation expiry: Month August Year 2020

Bushfire management plan version number: 1.0

Bushfire management plan date: Day 4th Month June Year 2020

Client/business name: Bennett Springs Land Development Pty Ltd

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

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use		✔
Vulnerable land-use		✔

None of the above ☑

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

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

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

Signature of report author or reviewer 

Date 4th June 2020

Bushfire Management Plan

(Subdivision Application)

Lots 624 and 625 Marshall Road, Bennett Springs

City of Swan

Job Number:	200104
Assessment Date:	28 March 2020
Report Date:	4 June 2020

BPP Group Pty Ltd t/a Bushfire Prone Planning
ABN: 39 166 551 784

Level, 159-161 James Street
Guildford WA 6055

PO Box 388
Guildford WA 6935

Ph: 08 6477 1144
Email: admin@bushfireprone.com.au

Disclaimer

The measures contained in this Bushfire Management Plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions. Additionally, the correct implementation of the required bushfire protection measures (and any associated response/evacuation plan if applicable) will depend, among other things, on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith based on information available to Bushfire Prone Planning at the time.

All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents - arising out of the services provided by their consultants.

Document Control

Version	Version Details	Date Submitted
1.0	First Issue	4-Jun-20

Author	Accreditation	Signature
Kathy Nastov	BPAD Level 3 - No. 27794	
Reviewed/Approved		
Ian Macleod	BPAD Level 2 - No. 39131	

Document Content Compliance Statement
This Bushfire Management Plan (the Plan) provides the required information to address State Planning Policy No. 3.7: Planning in Bushfire Prone Areas - December 2015 (SPP 3.7), the associated Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 (Guidelines), and any additional information as directed by the WA Planning Commission (WA Department of Planning, Lands and Heritage). It is fit for accompanying a planning application.
Structure Plan / Subdivision BMP Template v7.3

Table of Contents

List of Figures

Executive Summary

This Bushfire Management Plan is to accompany an application to subdivide Lots 624 and 625 Marshall Road, Bennett Springs located within the City of Swan. The application proposes two options for Lot 625 with Option 1 to create 12 residential Lots and Option 2 to create 23 residential Lots, both with 2 areas of Public Open Space and a Conservation Category Wetland buffer. Lot 624 is proposed to be subdivided into 79 residential Lots and will be developed in 2 stages.

Vegetation adjoining the subdivision is predominantly grassland with small pockets of woodland and a strip of forest running along the Bennett Brook. The Bennett Brook, a Conservation Category Wetland (CCW) and part of Whiteman Park managed by the WAPC, is located to the west of the subdivision. The CCW will require a vegetation buffer which will be located within the western portion of Lot 625, and this may be revegetated in the future. Revegetation of this buffer will not increase the BAL's on the proposed Lots to any greater than the maximum allowable BAL 29. The CCW buffer will be bordered by an area of POS which will be managed in a low bushfire threat state in perpetuity, with a second area of POS being located in the southern portion of Lot 625.

The bushfire assessment and management strategies contained in the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply. All of the proposed lots, with the exception of the CCW buffer, are required to be managed in a low bushfire threat state prior to issuing of new lot titles and throughout the life of the development.

A temporary Emergency Access Way will be installed through the future stage 2 of the development to provide two way access to stage 1 of Lots 625 and 624. As the remainder of Lot 624 is developed (Stage 2), the Temporary Emergency Access Way will be upgraded to the technical requirements for public roads.

A reticulated water supply will be made available for the subdivision at the development stage and hydrants will be installed throughout the site as required by the relevant authorities, this will be the responsibility of the developer.

1 The Proposal and Purpose of the Plan

1.1 Details

Landowner / Proponent:	Bennett Springs Land Development Pty Ltd
Site Address:	Lots 624 and 625 Marshall Road, Bennett Springs
Local Government:	City of Swan
Site Area:	5.8072 ha
No. of Proposed Lots:	102, plus 2 areas of Public Open Space (Option 1) OR 91, plus 2 areas of Public Open Space (Option 2).
Planning Stage:	Subdivision - a condition of approval
Subdivision Type:	Subdivision - large number of lots
Overview of the Proposal: Subdivision and development of Lots 624 and 625 Marshall Road, Bennett Springs.	
Bushfire Prone Planning Commissioned to Produce the Plan by:	Bennett Springs Land Development Pty Ltd
Purpose of the Plan:	To accompany a planning application
For Submission to:	WA Planning Commission (WAPC)

Figure 1.1

Proposed Subdivision
Lot Layout Plan - Option 1

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

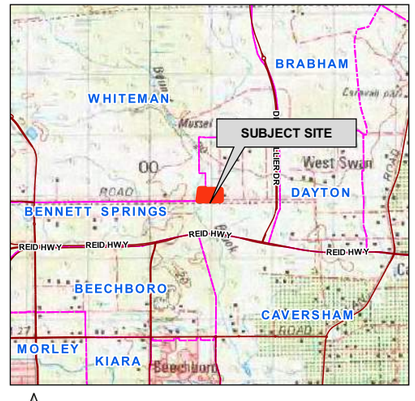
------ LEGEND ------

- Residential Lots
- Public Open Space
- Proposed Roads
- Road Widening
- Existing Road Reserve
- Stage 2
- Emergency Access Way (Stg 1)
- Subject Site
- Localities_Suburb
- Cadastre

0 10 20 30 40 50 60 70 80

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 04-06-2020
SCALE (A3): 1 : 1400

BUSHFIRE PRONE PLANNING

Figure 1.2

Proposed Subdivision
Lot Layout Plan - Option 2

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

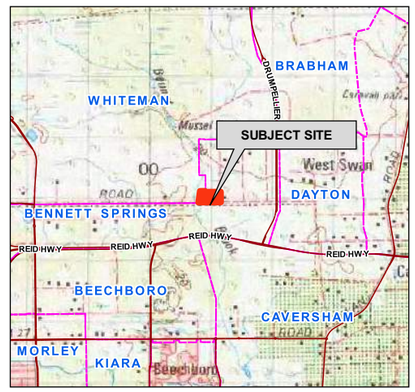
------ **LEGEND** ------

- Residential Lots
- Public Open Space
- Proposed Roads
- Road Widening
- Existing Road Reserve
- Stage 2
- Emergency Access Way (Stg 1)
- Subject Site
- Localities_Suburb
- Cadastre

0 10 20 30 40 50 60 70 80

Metres

------ **LOCALITY** ------



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Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 04-06-2020
SCALE (A3): 1 : 1400

BUSHFIRE PRONE PLANNING

Figure 1.3

Proposed Subdivision Spatial Context Map

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

Motor Museum of Western Australia
Tractor Museum of WA
Centro Altone Park
Mussel Pool
WHITEMAN
Horse Swamp
BRABHAM
ISOODON ST
HARROW ST
DULWICH ST
CHELTENHAM ST
RUGBY ST
DRUMPELLIER DR
TURQUOISE CH
SUNLIT AV
ARTHUR ST
BLUNDELL ST
West Swan
CRANLEIGH ST
SAM ROSA PL
Dayton
DAYTON BVD
Mulberry Well
COAST RD
Bennett Brook
MARSHALL RD
BENNETT SPRINGS
Beechboro Christian School
BENNETT SPRINGS DR
RAINBOW CR
Bennett Springs
Pegasus Park
KENNEDIA ENT
BRIDGEMAN DR
Rainbow Park
HILLWATER PROM
REID HWY
GIBSON WAY
GRANDIS RD
VICTORIA RD
Ironstone Hole
PENTECOST AV
ALTONE RD
THORBURN AV
BARBAROSSA DR
DAVIOT RD
RHINE CR
SACRAMENTO AV
Beechboro Child Health Centre
Altone Ward, Swan
SUFFOLK ST
CALORIA CH
William Henry Oval
AMAZON DR
LENA CR
SMALL ST
KING RD
SALISBURY RD
CUTTLER AV
CAVERSHAM
NOONAN RD
CASTELLA DR
DANUBE AV
Beechboro Licensed Post Office
BARLEE WAY
LORD ST
BENNETT ST
DARWIN CR
MADEIRA AV
MAGUIRE AV
BROCKMILL AV
Pinelli Estate Wines
MARTINICH DR
WEST SWAN RD
MORLEY
Altone Park
Lanius Park

0 200 400 600 800 1000

Metres

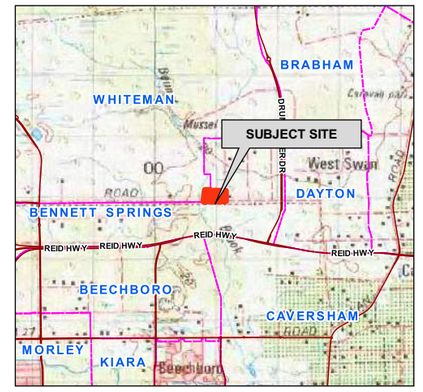
------ LEGEND ------

- Subject Site
- Localities_Suburb
- Cadastre
- Bush Forever Areas

Reserves UCL

- Reserve
- Unallocated Crown Land

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 02-06-2020
SCALE (A3): 1 : 15000

Figure 1.4

Proposed Subdivision Bushfire Prone Areas Map

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

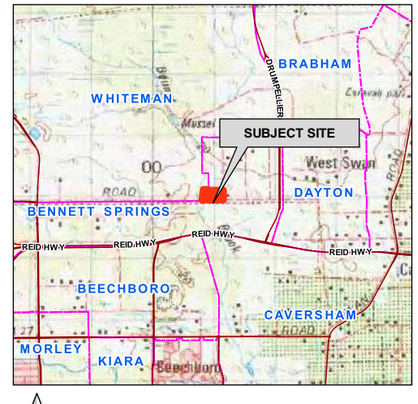
------ LEGEND ------

- Bush Fire Prone Areas 2019
- Subject Site
- Localities_Suburb
- Cadastre

0 200 400 600 800 1000

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 02-06-2020
SCALE (A3): 1 : 15000

BUSHFIRE PRONE PLANNING

1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

Relevant Documents		
Existing Document	Copy Provided by Client	Title
Structure Plan	Yes	TBB Local Structure Plan Layout
Environmental Report	No	
Landscaping (Revegetation) Plan	Yes	LD Total Landscape Plan
Bushfire Risk Assessments	Yes	Bushfire Management Plan – Attachment to BMP (BPP May 2020)

2 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

'Guidelines' s2.3: "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."

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, Wetlands and Bush Forever sites.

Environmental Protection Act 1986: "Clearing of native vegetation in Western Australia requires a clearing permit under Part V, Division 2 of the Act 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).

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act): This Act administered by the Australian Government Department of the Environment and Energy, provides a national scheme of environment and heritage protection and biodiversity conservation. 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 may have removal restrictions imposed.

Vegetation Modification and Clearing Assessment	
Will on-site clearing of native vegetation be required?	Yes
Does this have the potential to trigger environmental impact/referral requirements under State and Federal environmental legislation?	Unaware
Identified environmental legislation applicable to the Proposal site - No.1:	N/A
Identified environmental legislation applicable to the Proposal site - No.2:	N/A
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)?	Unaware
Potential TEC species identified:	N/A

A Conservation Category Wetland (CCW) is located to the west of the proposed subdivision, namely the Bennett Brook. The wetland will require a CCW buffer from the development, of 30m which has been included in the proposal. The proposal allows for significant vegetation to be retained with degraded areas to be revegetated in consultation with relevant agencies (LD Total Masterplan).

The bushfire assessment and management strategies contained in the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply.

Development Design Options

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

Minimising the Removal of Native Vegetation		
Design Option	Identified	Adopted
Reduction of lot yield	N/A	N/A
Cluster development	N/A	N/A
Construct building to a standard corresponding to a higher BAL rating as per BCA (AS 3959-2018 and/or NASH Standard)	No	No
Modify the development location	Yes	Yes

The proposed subdivision and future construction of buildings on the proposed Lots will allow for the development of asset protection zones without the clearing of large areas of significant vegetation. The development design has incorporated buffers from the future development to the Bennett Brook wetland and the required CCW buffer, including areas of managed public open space, roads and road verges.

Impact on Adjoining Land

Is this planning proposal able to implement the required bushfire measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	Yes

The proposed subdivision can achieve asset protection zone development and maintenance of vegetation on each Lot in a low bushfire threat state, which will ensure the bushfire risk will be reduced to the immediate surrounding properties due to the continued ongoing management of vegetation, on each newly created Lot. Compliance is regulated via the bushfire management plan for the site and the City of Swan annual Fire Hazard Reduction Notice (Firebreak Notice).

2.2 Re-vegetation / Retained Vegetation / Landscape Plans

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the Proposal.

Vegetation corridors may join offsite vegetation and provide a route for fire to enter a development area.

When applicable, any such area will be identified in this Bushfire Management Plan and their impact on the assessment and future management accounted for.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	Yes
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	Yes

The western portion of Lot 625 will be allocated to Public Open Space and Conservation Category Wetland (CCW) buffer. The CCW buffer may be revegetated and has therefore been classified as Forest. The POS bordering this area will consist of managed landscape including footpaths, drainage areas and verges and will be managed in this manner in perpetuity.

This is in line with the approved Landscape Plan for the site which incorporates a 21m setback from the property boundary to the CCW buffer, consisting of a 16.5m road reserve and a 4.5m wide public open space area. Refer to Figure 3.2 – post vegetation development.

3 Potential Bushfire Impact Assessment

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959-2018 specifies the fire danger index values to apply for different regions as per Table 2.1. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be refined if appropriately justified.

Table 3.1: Applied FDI Value

FDI Value			
Vegetation Area	As per AS 3959 - 2018 Table 2.1	As per DFES for the Location	Value Applied
1-3	80	N/A	80

3.1.2 Existing Vegetation Identification, Classification and Effective Slope

Vegetation identification and classification has been conducted in accordance with AS 3959-2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately with the worst-case scenario being applied as the classification. The predominant vegetation is not necessarily the worst-case scenario.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959-2018 s2.2.3.2-f and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Is the ground slope under the classified vegetation and is determined for each area of classified vegetation. It is the measured or determined slope which will most significantly influence the bushfire behaviour in that vegetation as it approaches a building or site. Where there is a significant change in effective ground slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified, based on the change in effective slope, to enable the correct assessment.

Table 3.2: Vegetation identification and classification

ALL VEGETATION WITHIN 150 METRES OF THE LOT				
Vegetation Area	Identified Classification Types [1] or Description if 'Excluded'	Applied Classification[2]	Effective Slope Under Classified Vegetation	
			degrees	description
1	Low Open Forest A-04	Class A Forest	0	Flat
2	Woodland B-05	Class B Woodland	0	Flat
3	Tussock Grassland G-22 Sown Pasture G-26	Class G Grassland	0	Flat
-	Low Threat Vegetation – Managed/maintained gardens and lawns, non vegetated areas	Excluded AS3959-2018 2.2.3.2 (e and f)	N/A	N/A

Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on the topography and classified vegetation map, Figure 3.1.

Note[1]: As per AS 3959-2018 Table 2.3 and Figures 2.3 and 2.4 a-g
Note[2]: As per AS 3959-2018 Table 2.3.

Vegetation Area 1	**Classification Applied or Exclusion Clause:** Class A Forest
Vegetation Type Present: Low open forest A-04	
Description / Classification Justification: Brook line dominated with melaleucas up to 12m in height with a canopy cover up to 90%, some flooded gums. Understorey of sedges and grasses in some areas and occasional shrubs including acacia and jacksonia.	

Photo ID: 1a

Photo ID: 1b

Vegetation Area 1	**Classification Applied or Exclusion Clause:** Class A Forest
Vegetation Type Present: Low open forest A-04	
Description / Classification Justification: Brook line dominated with melaleucas up to 12m in height and flooded gums, canopy cover up to 90%, open in some areas. Understorey of sedges and grasses, some areas with little to no ground cover.	

Photo ID: 1c

Photo ID: 1d

Vegetation Area 2	**Classification Applied or Exclusion Clause:** Class B Woodland
Vegetation Type Present: Woodland B-05	
Description / Classification Justification: Trees on average 15m in height, sandy, grass understorey. Canopy cover less than 30%. Photo 2b shows Woodland in background (excluded clear area is foreground of photo).	

Photo ID: 2a

Photo ID: 2b

Vegetation Area 2	**Classification Applied or Exclusion Clause:** Class B Woodland
Vegetation Type Present: Woodland B-05	
Description / Classification Justification: Background of photos 2c and 2d shows Woodland, with grassland understorey, absent of any shrubs, and up to 30% canopy cover (foreground is grassland and cleared areas). Clearing and removal of trees has been undertaken in the area for future development.	

Photo ID: 2c

Photo ID: 2d

Vegetation Area 2	**Classification Applied or Exclusion Clause:** Class B Woodland
Vegetation Type Present: Woodland B-05	
Description / Classification Justification: Background of photo- Woodland with trees to 15m in height, canopy 20% cover, grass understorey.	

Photo ID: 2e

Vegetation Area 3	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26; Tussock grassland G-22	
Description / Classification Justification: Sown pasture within open paddock areas and road verge.	

Photo ID: 3a

Photo ID: 3b

Vegetation Area 3	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26; Tussock grassland G-22	
Description / Classification Justification: Sown pasture within paddocks and unmanaged grasses.	

Photo ID: 3c

Photo ID: 3d

Vegetation Area 3	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26 ; Tussock grassland G-22	
Description / Classification Justification: Unmanaged grasslands within paddocks and along road verges. Occasional trees, less than 10% canopy cover.	

Photo ID: 3e

Photo ID: 3f

Vegetation Area 3	**Classification Applied or Exclusion Clause:** Class G Grassland
Vegetation Type Present: Sown pasture G-26 ; Tussock grassland G-22	
Description / Classification Justification: Unmanaged grasses within open paddocks, currently not grazed.	

Photo ID: 3g

Vegetation Area -	**Classification Applied or Exclusion Clause:** Excluded AS3959-2009 2.2.3.2 (e) Non-Vegetated Areas; Excluded AS3959-2009 2.2.3.2 (f) Low Threat Vegetation
Vegetation Type Present: Excluded	
Description / Classification Justification: Managed gardens and lawns within properties, nominally surrounding houses. Photo 4b shows managed lawn and gardens within fenced area (café).	

Photo ID: 4a

Photo ID: 4b

Vegetation Area -	**Classification Applied or Exclusion Clause:** Excluded AS3959-2009 2.2.3.2 (e) Non-Vegetated Areas; Excluded AS3959-2009 2.2.3.2 (f) Low Threat Vegetation
Vegetation Type Present: Excluded	
Description / Classification Justification: Areas recently cleared to the south of Marshall Road for future development. Photo 4d shows grassland area in the background.	

Photo ID: 4c

Photo ID: 4d

Figure 3.1

Existing Topography & Classified Vegetation

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

Bennett Brook
ROEDEAN ST
DULWICH ST
MARSHALL RD

AREA 1 Class (A) Forest Effective Slope 0°
AREA 2 Class (B) Woodland Effective Slope 0°
AREA 3 Class (G) Grassland Effective Slope 0°

1a 1b 1c 1d 2a 2b 2c 2d 2e 3a 3b 3c 3d 3e 3f 3g 4a 4b 4c 4d

18m 16m 14m 12m

------ LEGEND ------

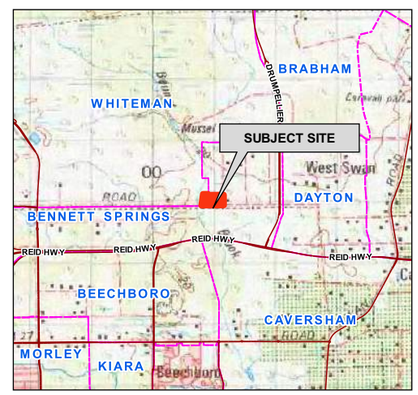
- Photos
- Elevation (m)
- Subject Site
- 150m_Assessment_Area
- Cadastre

Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125
Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

N

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 04-06-2020
SCALE (A3): 1 : 2200

Figure 3.2

Post Development Topography & Classified Vegetation Map

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

Bennett Brook

AREA 2
Class (B) Woodland
Effective Slope 0°

AREA 3
Class (G) Grassland
Effective Slope 0°

AREA 1
Class (A) Forest
Effective Slope 0°

ROEDEAN ST

DULWICH ST

MARSHALL RD

18m
16m
14m
12m

H

------ LEGEND ------

- Elevation (m)
- Proposed Lots
- Subject Site
- 150m_Assessment_Area
- Cadastre

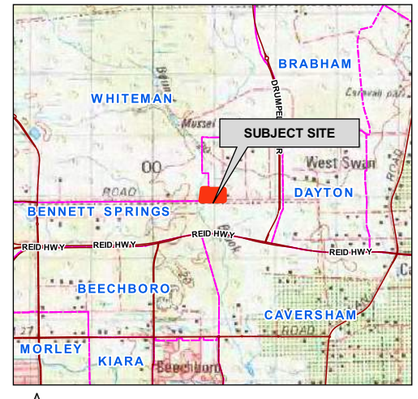
Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

N

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 02-06-2020
SCALE (A3): 1 : 2200

3.2 Assessment Output

Understanding the Bushfire Assessment Results - Application of Bushfire Attack Levels (BAL)

The BAL rating has a different application in the building environment compared to the planning environment and the BAL assessment can result in a determined BAL or an indicative BAL which have different implications.

Building versus Planning Applications

In the building environment, a determined BAL rating is required (for the proposed construction) at the building application stage. This is to inform approval considerations and establish the construction standards that are to apply if approved. An indicative BAL rating is not acceptable for a building application.

In the planning environment, assessing the ability of a proposed development site to achieve BAL-29 or less is the objective (as one of the bushfire protection criteria being assessed). The 'development site' is defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed".

Therefore, being able to show that a BAL rating of BAL-29 or lower is achievable for a proposed development site (i.e. the building footprint) is an acceptable outcome for that criteria, as established by the bushfire provisions, SPP 3.7 and the associated Guidelines. For planning purposes, this BAL rating could be either indicative or determined.

Determined BAL Ratings

A determined BAL rating is to apply to an existing or proposed construction site (building) and not to a lot or envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed.

A determined BAL cannot be given for a future building whose location, elevation design and footprint (on a given lot) are unknown. It is not until these variables have been fixed that a BAL can be determined (typically at the development application or building application stage).

The one exception is when a building of ***any dimension*** can be ***positioned anywhere*** on a proposed lot or within defined limits within the lot (i.e. building setbacks or building envelope) and always remain subject to the same BAL rating. For this to be the case, there needs to be no classified vegetation either onsite or offsite that if retained could impact upon the determined BAL rating.

Indicative BAL Ratings

When this Plan presents a single indicative BAL rating for a proposed construction site (building), this will be because the construction is still subject to a location within the lot being confirmed and/or a vegetation separation distance being achieved. That is, it will be conditional upon some factor being confirmed at a later stage.

For planning applications associated with proposed lots, the building location, elevation design and footprint have typically not been established. Therefore, indicative rather than determined BAL rating/s will be presented for each lot (with the exception as noted above under 'Determined BAL Ratings').

When this Plan presents a single indicative BAL rating for a lot or building envelope (i.e. an 'area' that is not a located building footprint) it will represent the highest BAL rating affecting that 'area'. The BAL rating of a future building on that 'area' will be dependent on its eventual location.

Otherwise, this Plan will present all BAL ratings for each lot and for each BAL rating, the vegetation separation distances from each area of classified vegetation that are to apply. These distances will be presented as either figures in a table or as a BAL contour map.

From this indicative BAL information, it can be assessed if acceptable BAL ratings (≤ BAL-29) can be achieved for future buildings.

3.2.1 Assessment Summary

Tables 3.3: Summary BAL results.

BAL Results – Summary of Assessment – Lot 625 Option 1 (detail of assessment and determination is presented in the following sections of this report)		
Proposed Lot	**BAL Status**	**Bushfire Attack Level**
1-9	Indicative Only	BAL-29
10, 21, 22 and 23	Indicative Only	BAL-19
11-20	Indicative Only	BAL-12.5
BAL Results – Summary of Assessment – Lot 625 Option 2 (detail of assessment and determination is presented in the following sections of this report)		
Proposed Lot	**BAL Status**	**Bushfire Attack Level**
1-7	Indicative Only	BAL-29
8-12	Indicative Only	BAL-12.5
BAL Results – Summary of Assessment – Lot 624 (detail of assessment and determination is presented in the following sections of this report)		
Proposed Lot	**BAL Status**	**Bushfire Attack Level**
24-25	Indicative Only	BAL-19
27	Indicative Only	BAL-12.5
28-31	Indicative Only	BAL-LOW
32-37	Indicative Only	BAL-12.5
38-43	Indicative Only	BAL-LOW
44	Indicative Only	BAL-12.5
45-47	Indicative Only	BAL-19
48-66	Indicative Only	BAL-12.5
67-70	Indicative Only	BAL-LOW
71, 72	Indicative Only	BAL-12.5
73-76	Indicative Only	BAL-LOW
77-91	Indicative Only	BAL-12.5
92-100	Indicative Only	BAL-19
101	Indicative Only	BAL-12.5
102	Indicative Only	BAL-19

3.2.2 Indicative BAL Results Presented as a BAL Contour Map

Interpretation of the Bushfire Attack Level (BAL) Contour Map

The contour map will present different coloured contour intervals constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels that exist at varying distances away from the classified vegetation.

Each BAL represents a set range of radiant heat flux (as defined by AS 3959-2018) that can be generated by the bushfire in that vegetation at that location.

The width of each shaded contour (i.e. the distance interval) will vary and is determined by consideration of variables including vegetation type, fuel structure, ground slope, climatic conditions. They are unique to a site and can vary across a site. The width of each contour is a diagrammatic expression of the separation distances from the classified vegetation that apply for each BAL rating, for that site.

A building (or 'area') located within any given BAL contour will be subject to that BAL rating and potentially multiple BAL ratings of which the highest rating will be applied.

Separation Distances Calculated to Construct the BAL Contours

Table 3.4: Vegetation separation distances applied to construct the BAL contours.

Calculated Vegetation Separation Distances

Vegetation Area	Vegetation Classification	Effective Slope	BAL Assessment Method Applied[1]	BAL Rating and Corresponding Separation Distance [2] (metres)				
		Degrees		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5
1	Class A Forest	0	Method 1	<16	16-<21	21-<31	31-<42	42-<100
2	Class B Woodland	0	Method 1	<10	10-<14	14-<20	20-<29	29-<100
3	Class G Grassland	0	Method 1	<6	6-<8	8-<12	12-<17	17-<50

[1] Method 1 as per AS 3959-2018 Table 2.5.

Criteria Adopted to Construct the BAL Contour Map

With the exception of the CCW buffer within Lot 625, the remainder of Lot 625 and the whole of Lot 624 will be managed in a low threat state.

Figure 3.3

Proposed Subdivision
BAL Contour Map - Option 1

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN

Area 1
Area 2
Area 3
Bennett Brook
Public Open Space
ROEDEAN ST
DULWICH ST
MARSHALL RD
1 22 23
2 21
3 20
4 19
5 18
6 17
7 16
8 15
9 10 11 12 13 14
24 25 45 46 47
26 44
27 43
28 42
29 41
30 40
31 39
32 38
33 37
34 36
35
102
101
100 99 98 97 96 95 94 93 92 91 90 89
77
76 78 79 80 81 82 83 84 85 86 87 88
75
74 72 71 69
73 70
48 55
49 51 52 54
50 53
68 67 66 65 64
56 63
57 62
58 61
59 60

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	0
2	B	Woodland	0
3	G	Grassland	0

------ LEGEND ------

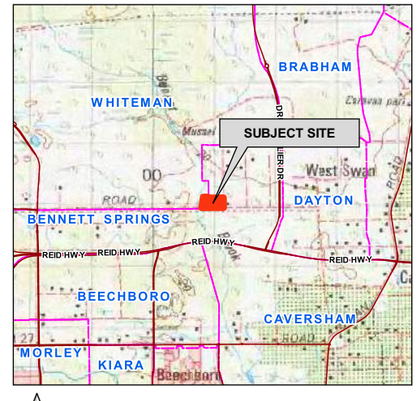
- Hydrants
- Proposed Lots
- Subject Site
- 100m BAL Buffer
- 150m Assessment Area
- Cadastre
- Vegetation Outline

Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 20 40 60 80 100 120
Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

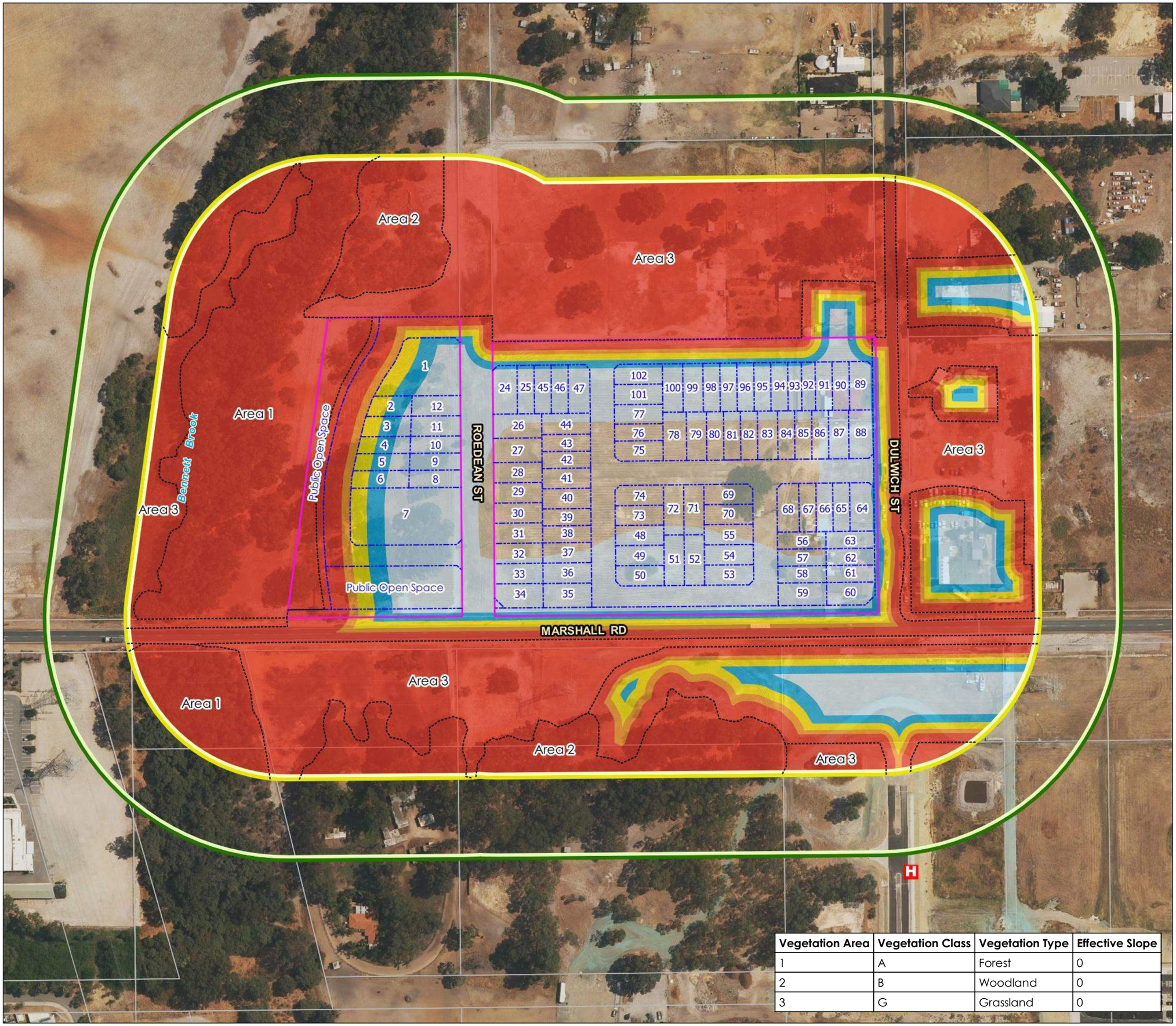
BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 04-06-2020
SCALE (A3): 1 : 2200

Figure 3.4

Proposed Subdivision
BAL Contour Map - Option 2

Lots 624 & 625 on Plan 3698
158 & 194 Marshall Road
BENNETT SPRINGS
CITY OF SWAN



Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	0
2	B	Woodland	0
3	G	Grassland	0

------ LEGEND ------

- Hydrants
- Proposed Lots
- Subject Site
- 100m BAL Buffer
- 150m Assessment Area
- Cadastre
- Vegetation Outline

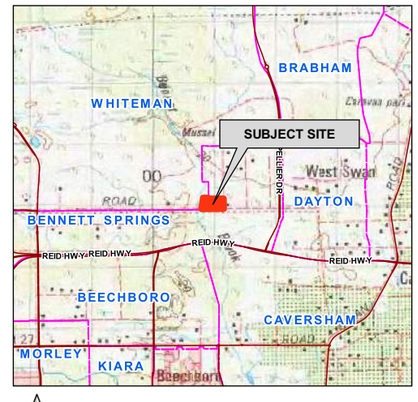
Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 20 40 60 80 100 120

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 04-06-2020
SCALE (A3): 1 : 2200

3.2.3 Bushfire Attack Levels (BAL) Derived from The Contour Map

Deriving a BAL Rating for a Future Construction Site (Building) from the BAL Contour Map Data

(Capacity to Issue a BAL Certificate)

Key Assumptions: The actual location of a building within a lot or envelope (an 'area') has not been determined at this stage of planning; and the BAL ratings represent the BAL of an 'area' not a building.

The BAL Rating is Assessed as Indicative

If the assessed BAL for 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 site or as a range of achievable BAL's within the site – 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 a lot or envelope with an indicative BAL, until the building location and in some instances building design (elevation), have been established and any required and approved vegetation modification/removal has been confirmed. Once this has occurred a report confirming the building location and BAL rating will be required to submit with the BAL certificate.

The required confirmation of the BAL rating must be done by a bushfire practitioner with the same level of accreditation as has been required to compile this Bushfire Management Plan. This is dependent on the type of calculations utilised (e.g. if performance based solutions have been used in the Plan BPAD Level 3 accreditation is required)

The BAL Rating is Assessed as Determined

If the assessed BAL for the lot or envelope is stated as being 'determined' it is because that lot or envelope is impacted by a single BAL contour interval. This BAL has been determined by the existence (or non-existence) of classified vegetation outside the lot or envelope, and no classifiable vegetation currently exists on the lot or envelope (i.e. it has been cleared to a minimal fuel, low bushfire threat state). In the situation where the BAL Contour Map has been constructed around multiple lots, there also needs to no classifiable vegetation on an adjacent lot if this vegetation has not already been incorporated into the creation of the BAL Contour Map.

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/envelope 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 'site' 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.

For a determined BAL rating for a lot/envelope, A BAL Certificate (referring to this BMP) can be provided for a future building, if the BMP remains current.

4 Identification of Bushfire Hazard Issues

The Bennett Brook is located to the west of the subdivision and is classified as a Conservation Category Wetland (CCW). It is a requirement for approval that a 30m vegetation buffer is applied to the wetland and portion of this buffer will be situated within the western portion of Lot 625. There will be a 21m setback from the westernmost Lots which will consist of roads, verges and drainage. The Public Open Space portion within this setback and road verge is required to be managed in a low bushfire threat manner throughout the life of the development, in the short term by the developer and in the longer term by the WAPC as part of Whiteman Park. The POS located in the southern portion of Lot 625 is also required to be managed in a low threat state in perpetuity, in the short term by the developer and in the long term by the City of Swan. The management of the 2 areas of POS to a low bushfire threat state will ensure the BAL's on the subdivided Lots do not increase past the maximum allowable BAL 29, or greater than that assessed when BAL's are determined at the building stage after Lot sale.

All of Lots 625 and 624, with the exception of the CCW buffer, are required to be maintained in a low bushfire threat state to not increase the assessed BAL's on subject Lots throughout the development.

As the subdivision is to be staged, a temporary Emergency Access Way is required to be installed to provide two way access to all Lots within Stage 1. As Stage 2 progresses the Emergency Access Way will be constructed as a public road and will meet all technical requirements of the guidelines.

5 Assessment Against the Bushfire Protection Criteria (BPC)

5.1 Bushfire Protection Criteria - Assessment Summary

Summarised Outcome of the Assessment Against the Bushfire Protection Criteria (BPC)						
Element	Basis for Achieving Compliance with the Intent of the Element			The Proposal Cannot Achieve Compliance with the Intent of the Element	The Element is Not Applicable to the Proposal	Not a Strategic Planning Proposal therefore Location Options Do Not Apply
	All Relevant Acceptable Solutions Are or Can be Met	The Performance Principle is Addressed (one or more solutions cannot be fully met, or it is inappropriate to do so –				
		Argument Justifying Compliance with the Intent is Presented	A Performance Principle-Based Solution is Applied	Progressed as Minor or Unavoidable Development	Different bushfire protection measures are to be applied to specified development types and land uses (as per a WAPC Position Statement or guidance)	
1. Location	✓					
2. Siting and Design of Development	✓					
3. Vehicular Access	✓					
4. Water	✓					

The Proposal has been assessed against:

1. The requirements established in Appendix 4 of the Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (the 'Guidelines'). The detail, including the technical requirements, are found at https://www.planning.wa.gov.au/8194.aspx; and
2. Any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the relevant local government. If known and applicable these have been stated in Section 5.2 of this Plan (with the detail included as an appendix if required by the relevant local government).

5.2 Bushfire Protection Criteria – Acceptable Solutions Assessment Detail

5.2.1 Element 1: Location

Bushfire Protection Criteria Element 1: Location Assessment Statements and Bushfire Protection Measures to be Applied			
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.			
Acceptable Solution:	A1.1: Development Location	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.

The subject site can achieve compliance by:

- Ensuring future building work on the Lot can be located on an area that will be subject to potential radiant heat from a bushfire not exceeding 29 kW/m^2 (i.e. a BAL rating of BAL-29 or less will apply – refer Figure 3.2: BAL Contour Map). This can be achieved by using positioning, design and appropriate on-site vegetation management; and
- Managing the remaining bushfire risk to an acceptable level by the existence/implementation and ongoing maintenance of all required bushfire protection measure. These measures include the requirements for vegetation management, vehicular access and firefighting water supply.

5.2.2 Element 2: Siting and Design of Development

Bushfire Protection Criteria Element 2: Siting and Design of Development Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.			
Acceptable Solution:	A2.1: Asset Protection Zone	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.

The subject site achieves compliance by:

- Ensuring future building work on the Lots can have established around them an APZ of the required dimensions - to ensure that the potential radiant heat from a bushfire to impact future building/s, does not exceed 29 kW/m^2 (i.e. a BAL rating of BAL-29 or less will apply to determine building construction standards);
- The APZ/s can be partially established within the Lot boundaries. The balance of the APZ's required dimensions are being contributed by areas on adjoining land that are 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 (managed neighbouring lots and street verges);
- The landowner or relevant authority 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 dimensions and standard, including compliance with the local government's annual firebreak notice.

5.2.3 Element 3: Vehicular Access

Bushfire Protection Criteria Element 3: Vehicular Access Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.			
Acceptable Solution:	A3.1: Two access routes	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.

Access to the subdivision will be provided by two main access points onto Marshall Road, namely via Dulwich Street and Roedean Street. Internal roads will meet the technical requirements of the Guidelines providing access in two different directions with 200m of each Lot. To satisfy this requirement, the road running east west and connecting to Dulwich Street, and the small portion of road running north south (between stage 1 and 2) which form Stage 2 of the development will be constructed as temporary Emergency Access Ways. They will be constructed to the standards as specified in the Guidelines (Table 6). When Stage 2 of the development progresses, all roads will be fully constructed to the required technical requirements to enable two access routes throughout the subdivision.

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. All roads will be constructed to the required technical standards for public roads in accordance with the staging of the development with Stage 1 roads and Emergency Access Ways installed, followed by all Stage 2 roads fully installed.

Acceptable Solution:	A3.2 Public Road	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.

Bushfire Protection Criteria Element 3: Vehicular Access (continued) Assessment Statements and Bushfire Protection Measures to be Applied			
Acceptable Solution:	A3.3 Cul-de-sacs (including a dead-end road)	Method of achieving Element compliance and/or the Intent of the Element:	N/A
Acceptable Solution:	A3.4: Battle-axe	Method of achieving Element compliance and/or the Intent of the Element:	N/A
Acceptable Solution:	A3.5: Private Driveways	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.6 Emergency Access Way	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.
A Temporary Emergency Access Way will be constructed to provide two access options for all Lots within Stage 1, one being south to Marshall Road and the other east through to Dulwich Street. See Figure 1.1 for detail. The technical requirements for Emergency Access Ways can and will be complied with.			
Acceptable Solution:	A3.7 Fire Service Access Routes	Method of achieving Element compliance and/or the Intent of the Element:	N/A
Acceptable Solution:	A3.8 Firebreak Width	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.
The subject site will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954. Firebreaks and hazard reduction, as necessary, will be installed/maintained annually and in perpetuity.			

5.2.4 Element 4: Water

Bushfire Protection Criteria Element 4: Water Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.			
Acceptable Solution:	A4.1 Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met.
A reticulated water supply will be available to the subject site and hydrants will be installed at the required regular intervals. (State required hydrant separation distances – 200m residential, 400m rural residential >1ha). The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 3.			
Acceptable Solution:	A4.2 Non-Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	N/A
Acceptable Solution:	A4.3 Non-reticulated Areas (Individual Lots)	Method of achieving Element compliance and/or the Intent of the Element:	N/A

5.3 Additional Information for Required Bushfire Protection Measures

The purpose of this section of the Plan is:

- As necessary, to provide additional detail (to that provided in the tables of Section 5.3) regarding the implementation of the acceptable solutions for those persons who will have the responsibility to apply the stated requirements;
- As necessary, to detail specific onsite vegetation management requirements such as the APZ dimensions, management of Public Open Space or application of landscaping plans for onsite vegetation;
- To discuss how staged development will be handled, if applicable; and
- As relevant, for future planning stages, consider and discuss the requirements that may apply to future planning applications and the content of the associated BMP. In particular:
    - Any potential Vulnerable or High-Risk Land Uses.
    - Any additional content that will be required in the future BMP.

5.3.1 Vegetation Management

Public Open Spaces within the subdivision will be installed and managed in the first instance by the proponent (~ 2 years) (refer to Landscape Master Plan, for sample design). After which management will then be taken over by the City of Swan (southern POS) and the WAPC (western POS). All POS will be required to be maintained in a low bushfire threat state in accordance with APZ requirements in perpetuity to maintain BAL's on future buildings within the subdivision (refer to Appendix 1 for requirements).

The Conservation Category Wetland buffer will be managed by the proponent in the first instance (~ 2 years), after which management will be taken over by the WAPC and incorporated into the overall management of the Bennett Brook (Whiteman Park). The CCW buffer may be revegetated and due to the distance from the proposed Lots, will not increase the BAL's greater than BAL 29.

Asset Protection Zone (APZ) Dimensions that are to Apply

The required dimensions of the APZ will vary dependent upon the purpose for which the APZ has been defined. There are effectively three APZ dimensions that can apply:

1. An application for planning approval will be required to show that an APZ can be created which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29); and
2. If the assessment has determined a BAL rating for an existing or future building is less than BAL-29, the APZ must be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed the kW/m² corresponding to the lower assessed BAL rating; or
3. Complying with the relevant local government's annual firebreak notice may require an APZ of greater size than that defined by the two previous parameters.

The dimensions (vegetation separation distances) that are to apply to the APZ for this Proposal are presented in the tables below.

Table 5.1: Planning Minimum Required Vegetation Separation Distances for the Proposed Development

The 'Planning (WAPC) BAL-29' APZ Minimum Required Vegetation Separation Distances for the Proposed Development				
Requirement Set By	Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.3)			
Relevant Fire Danger Index (AS3959-2018 Table 2.1)				80
BAL Determination Method	Method 1 (as per AS 3959-2018 s2.2.6 and Table 2.5)			
Vegetation Area	Applied Vegetation Classification	Effective Slope (degrees)	Maximum Acceptable 'Planning' BAL	Required Separation Distance (metres)
1	Class A Forest		BAL-29	21
2	Class B Woodland			14
3	Class G Grassland			8
This requirement has been established through the State bushfire provisions, SPP 3.7 and the associated Guidelines, as being a key compliance requirement for development proposals in WA.				

Table 5.2: Local Government Firebreak Notice Minimum Requirements.

'Local Government Firebreak Notice APZ' Required Minimum Dimensions for the Subject Site	
Requirement Set By:	Local Government
Minimum Dimensions:	20 metres. See City of Swan Fire Hazard Reduction Notice (Firebreak Notice)
Other Conditions:	If Asset Protection Zone technical requirements are defined in the Notice, the standards and dimensions may differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.
This requirement has been established through the stated local government's annual fire break notice issued under the Bushfires Act 1954 s33.	

6 Responsibilities for Implementation and Management of the Bushfire Protection Measures

Table 6.1: BMP Implementation responsibilities prior to the issue of titles for the Developer (Landowner).

DEVELOPER (LANDOWNER) - PRIOR TO ISSUE OF TITLES FOR NEW LOTS		
No.	Implementation Actions	Subdivision Clearance
1	Planning approval may be conditioned with the requirement to make appropriate notifications (on the certificates of title and the deposited plan), of the existence of this Bushfire Management Plan. The WAPC may condition a subdivision application approval with a requirement for the landowner / proponent to place a notification onto the certificate(s) of title and a notice of the notification onto the diagram or plan of survey (deposited plan). This will be done pursuant to Section 165 of the Planning and Development Act 2005 ('Hazard etc. affecting land, notating titles as to:') and applies to lots with a determined BAL rating of BAL-12.5 or above. The notification will be required to state: *'This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land'.*	☐
2	Construct the public roads to the standards stated in the BMP.	☐
3	Construct the emergency access ways, and associated signs and gates to the standards stated in the BMP.	☐
4	Install the reticulated water supply (hydrants) to the standards stated in the BMP.	☐
5	Prior to issuing of titles, each individual lot is to be compliant with the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.	☐
6	Maintain the site (excluding the CCW buffer) in a low bushfire threat manner so as to not increase the BAL on Lots within the development.	☐

Table 6.2: BMP Implementation responsibilities prior to lot sale, occupancy or building for the Landowner (Developer).

LANDOWNER (DEVELOPER) - PRIOR TO LOT SALE, OCCUPANCY OR BUILDING	
No.	Implementation Actions
1	Prior to sale of the subject lots, each individual lot is to be compliant with the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.
2	Establish the Asset Protection Zone (APZ) on the lot to the dimensions and standard stated in the BMP. This is the responsibility of the developer.
3	Prior to occupancy, install the private driveways to the standards stated in the BMP.
4	Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be: • The standard corresponding to the determined BAL rating, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard as a result of the BMP establishing that construction is required at a standard corresponding to a higher BAL rating.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

LANDOWNER/OCCUPIER - ONGOING	
No.	Ongoing Management Actions
1	Maintain the Asset Protection Zone (APZ) to the dimensions and standard stated in the BMP.
2	Comply with the name of the City of Swan annual Fire Hazard Reduction Notice (Firebreak Notice) notice issued under s33 of the Bush Fires Act 1954.
3	Maintain vehicular access routes within the lot to the required surface condition and clearances as stated in the BMP.
4	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 a determined BAL rating.
5	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the relevant local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

LOCAL GOVERNMENT - ONGOING	
No.	Ongoing Management Actions
1	Monitor landowner compliance with the Bushfire Management Plan and the annual Firebreak and Fuel Load notice.
2	The POS to be managed in accordance with the requirements of the BMP, to ensure the vegetation remains as low threat vegetation, in accordance with AS3959-2018.

Table 6.5: Ongoing management responsibilities for the WAPC.

WAPC - ONGOING	
No.	Ongoing Management Actions
1	The POS abutting the CCW buffer to be managed in accordance with the requirements of the BMP, to ensure the vegetation remains as low threat vegetation, in accordance with AS3959-2018.

Appendix 1 - Onsite Vegetation Management Technical Requirements

It is the responsibility of the landowner to maintain the established bushfire protection measures on their property. Not complying with these responsibilities can result in buildings being subject to a greater potential impact from bushfire than that determined by the assessed BAL rating presented in this Bushfire Management Plan.

For the management of vegetation within a lot (i.e. onsite) the following technical requirements exist:

1. **The APZ:** Installing and maintaining an asset protection zone (APZ) of the required dimensions to the standard established by the Guidelines for Planning in Bushfire Prone Areas (WA Planning Commission, as amended). When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.4.1 of this Plan.

2. **The Firebreak/Fuel Load Notice:** Complying with the requirements established by the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954. Note: If an APZ requirement is included in the Notice, the standards and dimensions may differ from the Guideline's APZ Standard – the larger dimension must be complied with.

3. **Changes to Vegetated/Non-Vegetated Areas:**

    a. If applicable to this Plan, the minimum separation distance from any classified vegetation, that corresponds to the determined BAL for a proposed building, must be maintained as either a non-vegetated area or as low threat vegetation managed to a minimal fuel condition as per AS 3959-2018 s2.2.3.2 (e) and (f). Refer to Part 4 of this Appendix 1.

    b. Must not alter the composition of onsite areas of classified vegetation (as assessed and presented in Section 3.1.2) to the extent that would require their classification to be changed to a higher bushfire threat classification (as per AS 3959-2018); and

    c. Must not allow areas within a lot (i.e. onsite) that have been:
        i. excluded from classification by being low threat vegetation or non-vegetated; and
        ii. form part of the assessed separation distance that is determining a BAL rating -

    …to become vegetated to the extent they no longer represent a low threat (refer to Part 4 of Appendix 1). Note: The vegetation classification exclusion specifications as established by AS 3959-2018 s2.2.3.2, are included at A1.4 below for reference.

1. Requirements Established by the Guidelines – the Asset Protection Zone (APZ) Standards

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1)

Defining the Asset Protection Zone (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.

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.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot can be utilised to achieve the required vegetation separation distances and therefore reduce the required 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.

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

Schedule 1: Standards for APZ

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.

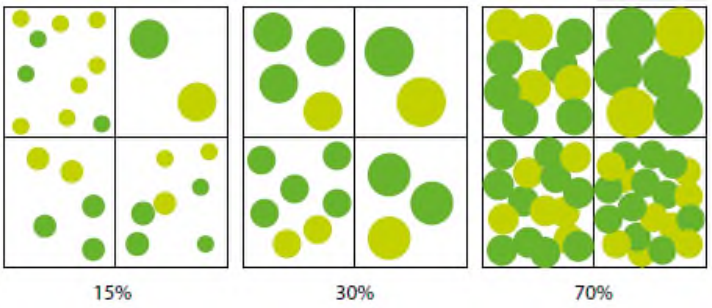
Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

Example Fine Fuel Load of Two Tonnes per Hectare

(Image 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.

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



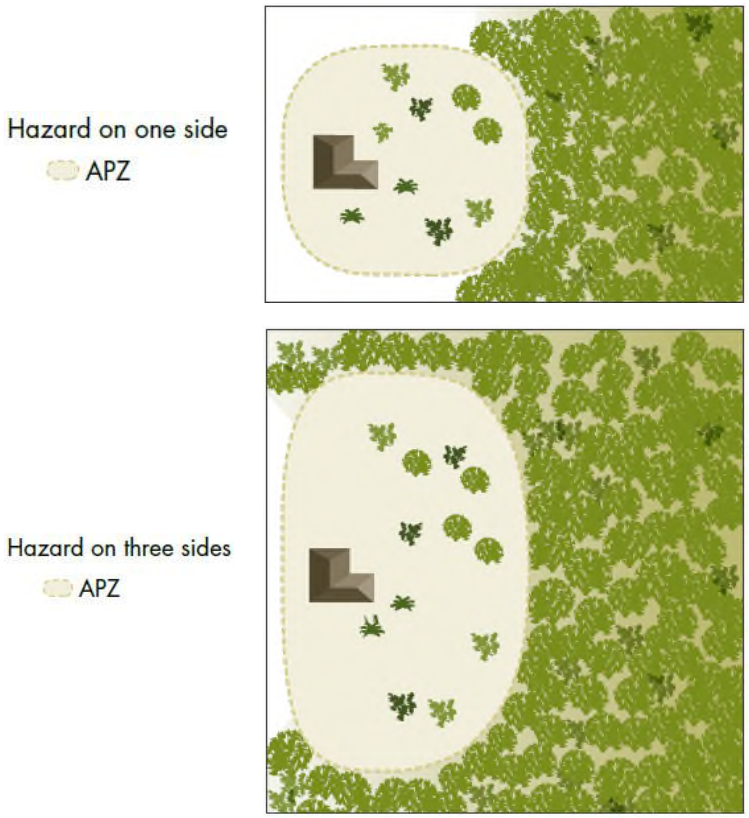
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

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.

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



2. Requirements Established by the Local Government – the Firebreak Notice

These requirements are established by the relevant local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

The relevant local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

If Asset Protection Zone technical requirements are defined in the Notice, the standards and dimensions may differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.4.1 of this Plan.

3. Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

4. Requirements Established by AS 3959-2018 - Maintaining Areas within your Lot as 'Low Threat'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959-2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

The Bushfire Attack Level shall be classified BAL-LOW where the 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 area 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 (measured perpendicular to the elevation exposed to the strip of vegetation) 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 2 - Vehicular Access Technical Requirements

Each local government may have their own standard technical requirements for emergency vehicular access and they may vary from those stated in the Guidelines.

Contact the relevant local government for the requirements that are to apply in addition to the requirements set out as an acceptable solution in the Guidelines. If the relevant local government requires that these are included in the Bushfire Management Plan, they will be included in this appendix and referenced.

Requirements Established by the Guidelines – The Acceptable Solutions

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4)

Vehicular Access Technical Requirements - Part 1

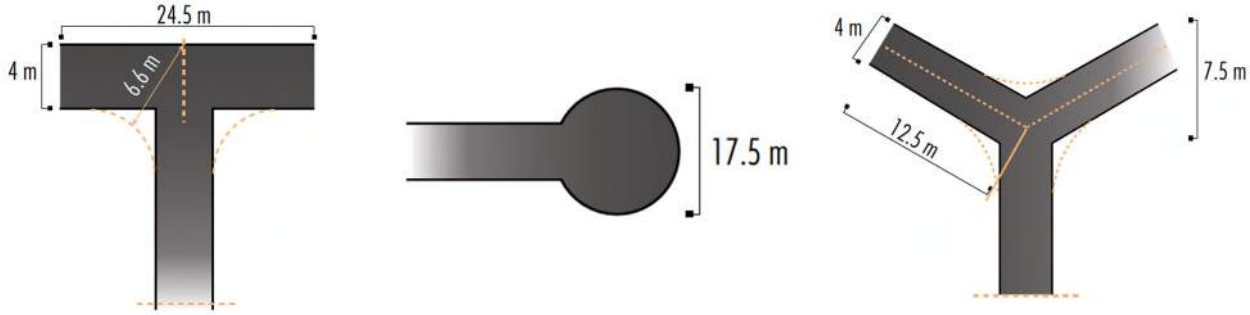
Acceptable Solution 3.5: Private Driveways

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:

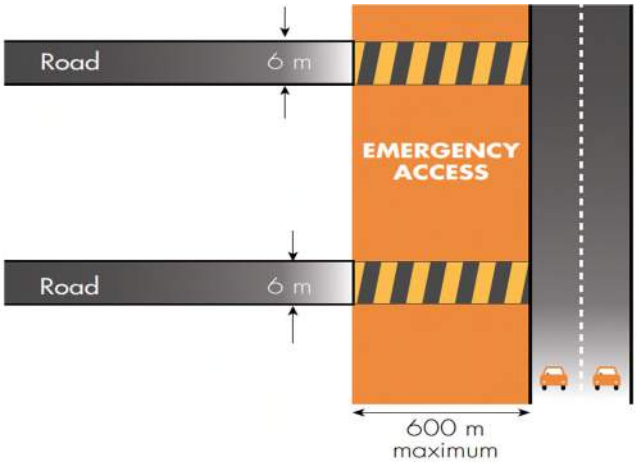
- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 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 3.8: 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 - Part 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

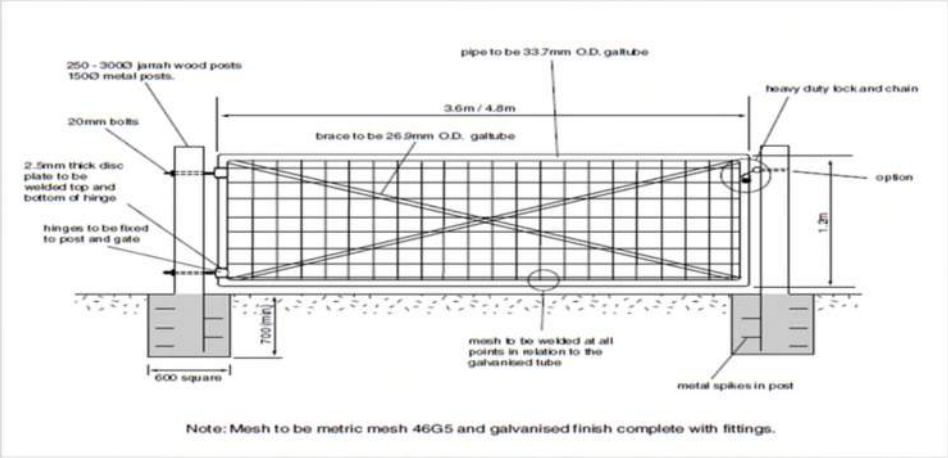
* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres 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 – Gates and Signs Examples

Gates

Design and construction to be approved by relevant local government.

- Minimum width 3.6m
- 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
Design and construction to be approved by the relevant local government.
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".
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.

Requirements Established by the Guidelines - Acceptable Solution A4.1: Reticulated Areas

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4, Element 4)

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES.

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 m^2 (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.

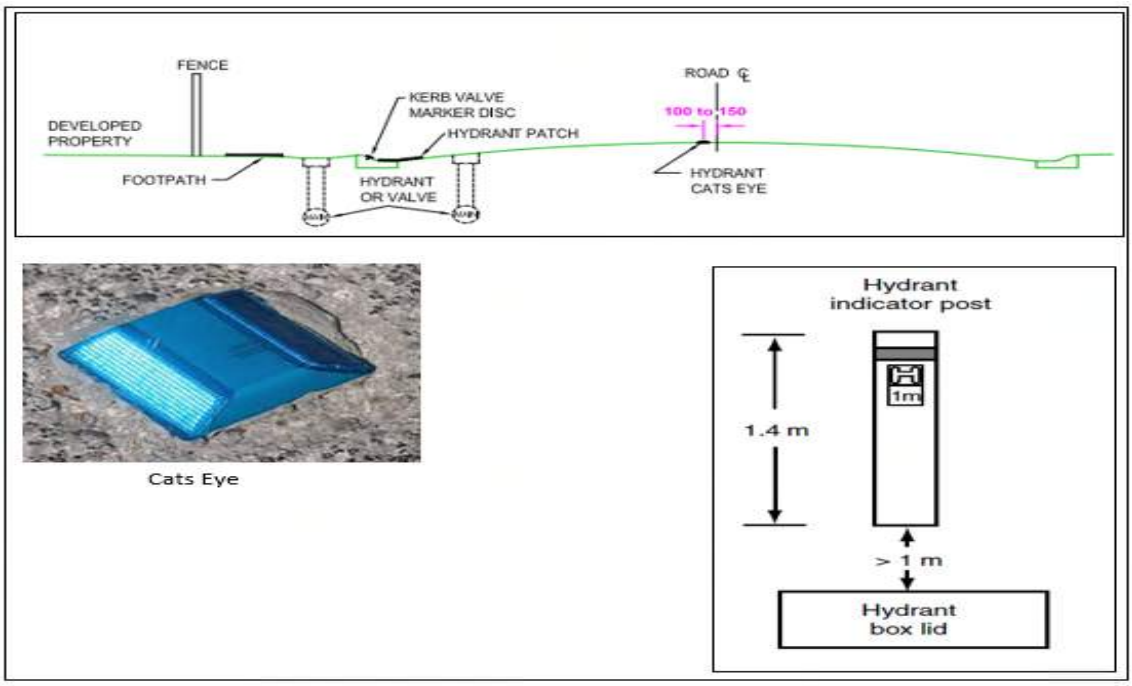


Figure A4.1: Hydrant Location and Identification Specifications

Contact the relevant water supply authority to confirm the technical requirements that are to be applied. They may differ from the minimum requirements of the 'baseline' Water Corporation's No. 63 Water Reticulation Standard.