BPP Pty Ltd t/a Bushfire Prone Planning
PO Box 3489 MIDLAND WA 6056
ABN 39 166 551 784

0459 558 986
admin@bushfireprone.com.au

Bushfire Management Plan (Strategic Planning Proposal)

Lot 1107 (40) Masonmill Road, Carmel

Shire of Kalamunda

Project Number: 16656

Assessment Date: 11 February 2016

Report Date: 12 February 2016

Plan Authoring, Version and Compliance Statement

BMP Template Version 3.4	©2016 BPP Pty Ltd

Document Author	Bushfire Planning and Design (BPAD) Accreditation Level	Number
Sean Winter	Level 2 Accreditation does not currently exist	-
Document Reviewer		
Mike Scott	Level 2 Accreditation does not currently exist	-

Version	Report Date	Reviewed Date	Submitted Date	Submitted To
Ver 1.0	12-Feb-16	29-Feb-16	29-Feb-16	Planner

Version	Amendment Record

Bushfire Management Plan Compliance Statement

As the author of this Bushfire Management Plan (the Plan) I state that this 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 2015; the Guidelines).

Sean Winter 

Contents

1 EXECUTIVE SUMMARY 4

2 COMMISSIONING AND THE PROPOSAL 5

3 APPLICATION OF SPP 3.7 2

4 PLANNING SUBMISSION DETAILS AND REQUIRED BUSHFIRE RISK ASSESSMENTS 3

5 ASSESSMENT OF BUSHFIRE RISK 5

5.1 Vegetation Identification and Classification 5
5.1.1 Existing Vegetation 5
5.1.2 Vegetation Excluded from Classification 5
5.1.3 Expected On-site Vegetation Changes Due to Proposed Subdivision or Development 5
5.2 Bushfire Hazard Level (BHL) Assessment 10
5.3 Bushfire Attack Level (BAL) Contour Map 13
5.3.1 Identification of Specific Issues Arising from BAL Contour Map 15
5.3.2 Existing Habitable Buildings on Subject Site – BAL Ratings 15
5.3.3 Identification of Specific Issues Arising from BAL Assessment 16
5.4 Bushfire Protection Criteria – Assess and Demonstrate Compliance 17

6 ENVIRONMENTAL CONSIDERATIONS 23

6.1 Native Vegetation and Re-vegetation 23

7 BUSHFIRE RISK MANAGEMENT MEASURES 25

7.1 Siting of Buildings and Allowable BAL's 25
7.2 Vegetation Management 25
7.3 Vehicular Access 26
7.4 Firefighting Water Supply 26
7.5 Required Building Construction Standards 26
7.6 Existing Habitable Buildings on Subject Site 27

8 STATEMENTS OF PROPOSAL COMPLIANCE AND JUSTIFICATION 28

8.1 State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7) 28
8.2 Guidelines for Planning in Bushfire Prone Areas (WAPC 2015 as amended) 30
8.3 Bushfire Protection Criteria (WAPC 2015 'Guidelines') 30
8.4 Local Variations to Bushfire Protection Criteria 31
8.5 WA Building Act 2011 31
8.6 AS 3959 Construction of Buildings in Bushfire Prone Areas (2009 as amended) 32
8.7 Local Government Fire Break Notice 33
8.8 Other Applicable Local Government Documents 33

9 RESPONSIBILITIES FOR IMPLEMENTATION & MAINTENANCE 34

9.1 Landowner / Proponent Responsibilities (and those acting on their behalf) 34
9.2 Builder Responsibilities 36
9.3 Local Government Responsibilities 36

10 APPENDICES 38

Appendices

APPENDIX 1..... 38

THE WA FRAMEWORK FOR BUSHFIRE RISK MANAGEMENT 38

APPENDIX 2..... 44

BUSHFIRE RISK ASSESSMENT – UNDERSTANDING THE METHODOLOGY 44

APPENDIX 3..... 48

VEGETATION CLASSIFICATION EXCLUSIONS (AS 3959-2009 S2.2.3.2) 48

APPENDIX 4..... 49

TECHNICAL REQUIREMENTS – BUSHFIRE PROTECTION CRITERIA (APZ & HSZ).....49

APPENDIX 5..... 51

TECHNICAL REQUIREMENTS - BUSHFIRE PROTECTION CRITERIA (VEHICULAR ACCESS) 51

APPENDIX 6..... 56

TECHNICAL REQUIREMENTS - BUSHFIRE PROTECTION CRITERIA (WATER) 56

1 Executive Summary

This Bushfire Management Plan has been prepared to allow the land owners of Lot 1107 (40) Masonmill Road, Carmel within the Shire of Kalamunda, to plan the development of the lot for tourism purposes, and to understand their obligations with regard to bushfire planning regulations. The Proposal requires the application of *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7).

The development site is within a designated bushfire prone area and the assessed bushfire risk is considered to be manageable. This has been determined by demonstrating compliance against all applicable legislation, policy, standards and guidelines including the four elements of the Bushfire Protection Criteria.

Against the Bushfire Protection Criteria, this Proposal is to be assessed on the basis of fully meeting the acceptable solutions.

It is possible to site buildings within Lot 1107 so that they do not exceed BAL-29 (assessed using Method 1 as per AS 3959-2009).

The highest indicative Bushfire Attack Level for the proposed development does not exceed BAL-29 (assessed using Method 1 as per AS 3959-2009).

Future buildings within 100 metres of classified vegetation are to be constructed to standards which correspond to the determined BALs, as required by *AS 3959-2009 Construction of buildings in bushfire prone areas*. As this proposal does not identify the actual location of building works within each lot, there may be a requirement to determine the BAL for individual building works once the actual building site has been identified.

An Asset Protection Zone (APZ) has been recommended to be incorporated into the landscaping surrounding any future buildings and is to be maintained. This will assist with reducing bushfire risk and improve the safety of firefighters and residents during fire suppression activities.

There is two-way access to the property via Masonmill Road. The private driveways on the subject lot will need to be upgraded to meet the standards as set out in the *Guidelines for Planning in Bushfire Prone Areas (2015).*

The subject site has appropriate water tanks with compliant couplings. However, access to these tanks is not compliant with the standards as set out in the *Guidelines for Planning in Bushfire Prone Areas (2015)* and is required to be upgraded.

Management of the bushfire risk will be achieved by the implementation and maintenance - by the identified stakeholders - of the stated bushfire risk management measures and other requirements as set out in this BMP.

2 Commissioning and the Proposal

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

Commissioning Record	
Landowner / Proponent:	Rob Tieleman
BPP Commissioned by:	Land Insights
Purpose:	To determine the requirements for development of the subject site

Proposed Project Location	
Subject Site:	Lot No. 1107
Zoning and R-Code:	Rural Conservation
Road:	Masonmill Road
Locality:	Carmel
Local Government:	Shire of Kalamunda

Proposed Project Description	
Description:	Development of subject property for tourism purposes
Site Plan:	Refer to Figure 2.1
Site Map:	Refer to Figure 2.2

Figure 2.1: Site Plan

3 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 and will apply if any of the first three conditions is satisfied and the fourth;

Are the conditions for application of SPP 3.7 satisfied?	
1. The project site is located in a designated bushfire prone area on the WA Map of Bushfire Prone Areas:	**Yes**
2. 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:	**N/A**
3. The project site is located 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 2015 s3.2.2*):	**N/A**
4. The planning submission is a higher order strategic planning document, a strategic planning proposal or a subdivision or development application;	**Yes**

This planning submission will need to comply with the *policy measures* of *SPP 3.7* if either of the following first two conditions is satisfied. If the submission is a development application the third condition must also be satisfied;

Is the requirement to comply with the policy measures of SPP 3.7 satisfied?	
1. The subject land has or will have a Bushfire Hazard Level above Low:	**Yes**
2. The subject land has or will have a Bushfire Attack Level rating above BAL-Low:	**Yes**
3. The development application is for a lot or lots greater than 1100m^2 **or** for the construction or/and use of a habitable building other than a single house or ancillary dwelling (*Local Planning Scheme Amendment Regulations 2015*):	**N/A**

4 Planning Submission Details and Required Bushfire Risk Assessments

Planning Submission Detail	
Planning Stage:	Strategic - local planning scheme/amendment
Project Type:	Change of use / addition of use
Vulnerable Land Use:	No
High Risk Land Use:	No
Minor Development:	No
Unavoidable Development:	No
For Submission to:	Shire of Kalamunda

Policy measures in *SPP 3.7* (and the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*) set out the bushfire planning information and 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).

This Bushfire Management Plan will include the following required information as indicated by the check mark. If an item is not checked it is not required by either SPP 3.7 or by a local government variation and has not been requested by the proponent;

Bushfire Hazard Level Assessment	Bushfire Attack Level Contour Map	Bushfire Attack Level Assessment	Identify any issues arising from BAL contour map or BAL assessment	Identify and specifically address the list of issues defined in the *Guidelines s5.2*	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 can be utilised voluntarily.

5 Assessment of Bushfire Risk

5.1 Vegetation Identification and Classification

5.1.1 Existing Vegetation

All vegetation within 100 metres of the subject site has been identified and classified or excluded and presented in Table 5.1 (in accordance with *AS 3959-2009 s2.2.3*.2 - refer Appendix 3 'Vegetation Classification Exclusions'). Representative photos of each vegetation area are presented after Table 5.1.1

These areas of classified vegetation that will determine the bushfire risk and behaviour are defined on the topography and vegetation map Figure 5.1.

5.1.2 Vegetation Excluded from Classification

Certain areas and vegetation may be assessed as 'low threat or non-vegetated'. These are to be excluded from classification and are therefore rated BAL-LOW (refer Appendix 3 'Vegetation Classification Exclusions').

The entirety of Lot 1107 Masonmill Road is considered low threat under clause 2.2.3.2(f) of *AS-3959* (2009). Two low threat areas exist on adjacent lots: (i) a small area of managed pasture on Lot 312, 50 Masonmill Road to the south; and (ii) an area along the creekline, including two dams, on Lot 8, 550 Canning Road to the north.

5.1.3 Expected On-site Vegetation Changes Due to Proposed Subdivision or Development

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed for this Proposal. This may be due to growth of existing vegetation or as part of future landscape plantings, including future roadside re-vegetation. In particular, 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 the subdivision area.

For this Proposal the future onsite vegetation has been considered and is expected to be maintained as "low threat" with a BAL rating of BAL-Low. It will meet *AS 3959-2009 s2.2.3.2* requirements (refer Appendix 3 'Vegetation Classification Exclusions').

Figure: 5.1

Topography & Classified Vegetation

Lot 1107 Masonmill Rd, Carmel

LEGEND

- Lot 1107
- Other Lots
- Area of Interest - 100m extent

Classified Vegetation

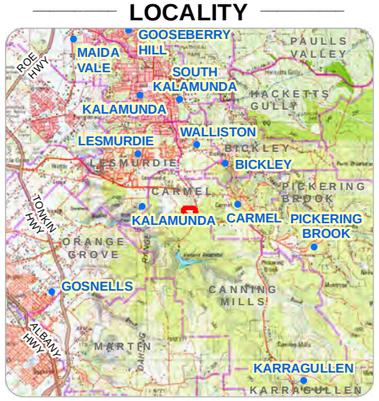
- (A) Forest
- (B) Woodland
- (G) Grassland
- Managed
- Exclusion
- Elevation (m)

SCALE (A3)

0 25 50 75 100

Meters

LOCALITY



N

Assessment Date: 11/02/2016 Image Date: Feb-15
Prepared by: Sean Winter
Accreditation Level: Accreditation No: Expiry:

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator

BUSHFIRE PRONE PLANNING

Created on: 22/02/2016

AREA : 1
Class (A) Forest

AREA : 2
Class (A) Forest

AREA : 3
Class (A) Forest

AREA : 4
Class (B) Woodland

AREA : 5
Class (G) Grassland

AREA : 6
Class (A) Forest

LOW THREAT : Managed
Exclusion 2.2.3.2(f)

LOW THREAT : Nursery
Exclusion 2.2.3.2(f)

LOW THREAT : Rocky Outcrops
Exclusion 2.2.3.2(e)

LOT 1107

MASONMILL RD

265 m 260 m 255 m 250 m 245 m 240 m 235 m 230 m 225 m 220 m 215 m 210 m

Table 5.1: Vegetation types identified, the applied classification and effective slope

All Vegetation Within 100 metres of Subject Site			
Vegetation Area	**Identified Types (AS3959) or Description if 'Excluded'**	**Applied Classification**	**Effective Slope Under Classified Vegetation (degrees)**
1	Open jarrah / marri forest A-03	Class A Forest	11
2	Open jarrah / marri forest A-03	Class A Forest	0
3	Open jarrah / marri forest A-03	Class A Forest	7
4	Marri / wandoo woodland B-05	Class B Woodland	7
5	Closed tussock grassland G-21	Class G Grassland	6
6	Open jarrah / marri forest A-03	Class A Forest	0
7	Managed gardens	Exclusion AS3959-2009 2.2.3.2 (f)	0

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.

Vegetation Area 1 **Classification Applied: Class A Forest**

Assessment Comment: Jarrah / marri forest

Photo 1

Vegetation Area 2 **Classification Applied: Class A Forest**

Assessment Comment: Jarrah / marri forest

Photo 2

Photo 3

Vegetation Area 3 **Classification Applied: Class A Forest**

Assessment Comment: Jarrah / marri forest with significant weed (blackberry / lantana / bracken) infestation

Photo 4

Vegetation Area 4 **Classification Applied: Class B Woodland**

Assessment Comment: Marri / wandoo woodland with grass / watsonia understory

Photo 5

Photo 6

Vegetation Area 5 **Classification Applied: Class G Grassland**

Assessment Comment: Closed tussock grassland

Photo 7

Vegetation Area 6 **Classification Applied: Class A Forest**

Assessment Comment: Jarrah / marri forest

Photo 8

Photo 9

Vegetation Area 7 **Classification Applied: Exclusion AS3959-2009 2.2.3.2 (f)**

Assessment Comment: Managed gardens

Photo 10

Photo 11

5.2 Bushfire Hazard Level (BHL) Assessment

For a summary of the assessment methodology refer to Appendix 2. BHL assessments are required to accompany all strategic planning proposals unless the future lot layout of the Proposal is known in which case a BAL Contour Map is more appropriate (SPP 3.7 s6.3).

Is a Bushfire Hazard Level assessment required to be included in this Bushfire Management Plan?	**Yes**

The results of the Bushfire Hazard Level assessment, detailing the vegetation type, class and the hazard levels assigned, are presented in Table 5.2 and are identified on the Bushfire Hazard Level Map, Figure 5.2.

Table 5.2: Results of BHL assessment

Assessed Area	Bushfire Hazard Level
Land inside the external boundary of the subject site:	**Low**
Land within 100 metres of external boundary of the subject site:	**Moderate + Extreme**
Method of assessment (using the methodology set out in the 'Guidelines' Appendix 2):	**site inspection + aerial map data**

If any of the assessed area is determined to have an extreme BHL this will trigger further considerations.

Can the extreme hazard level be initially reduced to low or moderate and then maintained for the life of the development?	**No**

If the assessment is 'Yes' then Section 7 of this Plan 'Bushfire Risk Management Measures' will outline how this will be achieved. If the assessment is 'No' then the indicative Bushfire Attack Levels for the subject site will need to be BAL-29 or lower for the subject land to be considered suitable for development – unless it meets the definition of minor or unavoidable development.

Are the indicative Bushfire Attack Levels for the subject site BAL-29 or lower?	**Yes**
Is this proposal for 'minor' or 'unavoidable' development?	**No**

Figure 5.2

Bushfire Hazard Level

Lot 1107 Masonmill Rd,
Carmel

LEGEND

- Lot 1107
- Other Lots
- Area of Interest - 100m extent

Bushfire Hazard Level

- Extreme Bushfire Hazard
- Moderate Bushfire Hazard
- Low Bushfire Hazard

NOTE: Hazard mapping has been prepared in accordance with the methodology set out in the Guidelines for Planning in Bushfire Prone Areas, (WAPC 2015, as ammended).

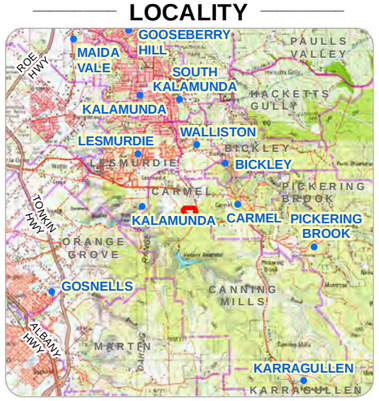
Hazard mapping is required to extend for 100m beyond the property boundary.

SCALE (A3)

0 25 50 75 100

Meters

LOCALITY



Assessment Date: 11/02/2016 Image Date: Feb-15
Prepared by: Sean Winter
Accreditation Level: Accreditation No: Expiry:

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator

BUSHFIRE PRONE PLANNING

Created on: 22/02/2016

5.3 Bushfire Attack Level (BAL) Contour Map

"A BAL Contour Map of the subject lot/s illustrates the potential radiant heat impacts and associated BAL ratings in reference to any vegetation within 100 metres of the assessment area after subdivision works are complete. It is typically used at the subdivision stage of the planning process, but is also appropriate for strategic planning proposals where the lot layout of a proposal is already determined ('Guidelines' s4.2)."

"A BAL Contour Map is based on an assessment of the development site and surrounding area as they will be when the proposed 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" (Factsheet BAL Contour Maps Version 1 December 2015 WAPC).

BAL assessment procedure applied:	**Simplified procedure 'Method 1" (AS 3959-2009)**
Vegetation assessment:	**Physical site inspection**

Refer to Appendix 2 'Bushfire Risk Management – Understanding the Methodology', for a summary of the BAL assessment procedures.

Figure 5.3 on the following page is the BAL Contour Map for this Proposal and the data is also tabulated in Table 5.3.

In accordance with SPP 3.7 Planning in Bushfire Prone Areas, proposed lots where a BAL-40 or BAL-FZ rating is indicated on the BAL Contour Map will generally not be supported except where it meets the definition of minor or unavoidable development.

Are the indicative or determined Bushfire Attack Levels any of the proposed lots BAL-40 or BAL-FZ?	**No**
Does this proposal include an application for 'minor' or 'unavoidable' development on any lot?	**No**

If this proposal includes an application for 'minor' or 'unavoidable' development on any lot, then Section 7 of this Plan 'Bushfire Risk Management Measures' will present the required additional information.

Figure 5.3

Bushfire Attack Level Contour Map

Lot 1107 Masonmill Rd, Carmel

LEGEND

- Lot 1107
- Other Lots
- Area of Interest - 100m extent
- Elevation (m)

Bushfire Attack Levels (Method 1)

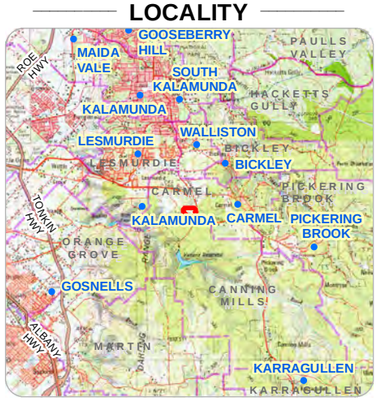
- BAL FZ (Indicative only)
- BAL 40 (Indicative only)
- BAL 29 (Indicative only)
- BAL 19 (Indicative only)
- BAL 12.5 (Indicative only)
- BAL LOW (Indicative only)

SCALE (A3)

0 25 50 75 100

Meters

LOCALITY



N

Assessment Date: 11/02/2016 Image Date: Feb-15
Prepared by: Sean Winter
Accreditation Level: Accreditation No: Expiry:

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator

BUSHFIRE PRONE PLANNING

Created on: 22/02/2016

Table 5.3: Achievable BAL's for Lot 1107

Achievable (Indicative) Bushfire Attack Levels for Lot 1107 *(as per AS 3959-2009 Method 1 and Table 2.4.3)*							
Lot Number	**Vegetation Area**	**Applied Vegetation Classification**	**Effective Slope Under the Classified Vegetation (degrees)**	**Achievable BAL's**			
				BAL-29	**BAL-19**	**BAL-12.5**	**BAL-LOW**
				Identified by stating the separation distance (in metres) to classified vegetation required to achieve the stated BAL			
1107	1	Class A Forest	11	42-<56	56-<73	73/<100	Not Achievable
	2	Class A Forest	0	21-<31	31-<42	42-<100	Not Achievable
	3	Class A Forest	8	33-<46	46-<61	61-<100	Not Achievable
	4	Class B Woodland	7	22-<31	31-<43	43-<100	Not Achievable
	5	Class G Grassland	6	10-<16	16-<23	23-<50	Not Achievable
	6	Class A Forest	0	21-<31	31-<42	42-<100	Not Achievable
	7	Exclusion AS3959-2009 2.2.3.2 (f)	0	N/A	N/A	N/A	N/A

5.3.1 Identification of Specific Issues Arising from BAL Contour Map

The BAL contour map highlights areas of the property where it is possible to locate new buildings, and the BAL level they must correspond to, dependent upon location.

5.3.2 Existing Habitable Buildings on Subject Site – BAL Ratings

For any existing habitable buildings on the subject site the following Bushfire Attack Level assessment is provided for each building. The recommended bushfire risk management measures to apply to each building are detailed in Section 7 of this Plan.

Existing Building BAL Assessment – Cafe				
Vegetation Area	**Applied Vegetation Classification**	**Effective Slope Under Vegetation (degrees)**	**Separation Distance From Building to Vegetation (metres)**	**Bushfire Attack Level**
1	Class A Forest	11	111	BAL-LOW
2	Class A Forest	0	104	BAL-LOW
3	Class A Forest	8	112	BAL-LOW
4	Class B Woodland	7	134	BAL-LOW
5	Class G Grassland	6	40	BAL-12.5
6	Class A Forest	0	38	BAL-19
7	Exclusion AS3959-2009 2.2.3.2 (f)	N/A	N/A	N/A
			Determined Bushfire Attack Level (AS3959-2009 Method 1)	**BAL-19**

Existing Building BAL Assessment – House				
Vegetation Area	**Applied Vegetation Classification**	**Effective Slope Under Vegetation (degrees)**	**Separation Distance From Building to Vegetation (metres)**	**Bushfire Attack Level**
1	Class A Forest	11	94	BAL-12.5
2	Class A Forest	0	152	BAL-LOW
3	Class A Forest	8	106	BAL-LOW
4	Class B Woodland	7	178	BAL-LOW
5	Class G Grassland	6	48	BAL-12.5
6	Class A Forest	0	15	BAL-FZ
7	Exclusion AS3959-2009 2.2.3.2 (f)	N/A	N/A	N/A
			Determined Bushfire Attack Level (AS3959-2009 Method 1)	**BAL-FZ**

5.3.3 Identification of Specific Issues Arising from BAL Assessment

Any modifications made to the two existing buildings must comply with requirements for the assessed BAL ratings. The house is rated BAL-FZ and as such, any development application for the alteration of this building is unlikely to be granted, unless the separation distance between it and classified vegetation is increased to allow a BAL rating of BAL-29 (or lower) to be achieved.

5.4 Bushfire Protection Criteria – Assess and Demonstrate Compliance

(Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*)

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 (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 minor or 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	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
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 **OR** The development is subject to BAL-29 or below.	**Yes** ✓	**No** ☐	**N/A** ☐	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 (which requires WAPC, DFES and local planning approval).	The proposed development is located within a designated bushfire prone area. The proposal is compliant as building envelopes can be cited subject to BAL-29 or below. The bushfire risk can be managed by constructing buildings to the standard that corresponds to the determined Bushfire Attack Level; maintaining the required separation distance from classified vegetation; creating and maintaining asset protection zones (primarily vegetation management); and meet requirements for vehicular access and firefighting water supply.

Bushfire Protection Criteria - Element 2 - Siting and Design of Development					
Intent: To ensure that the siting and design of development minimises the level of bushfire impact.					
Performance Principle P2 (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 minimises the bushfire risk to people, property and infrastructure, including compliance with *AS3959* if appropriate.					
Acceptable Solution (either or both solutions to be met to the extent that it satisfies Element 1)	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
	Yes	**No**	**N/A**		
A2.1 **Asset Protection Zone (APZ)** Every building is surrounded by a minimum 20 metre wide Asset Protection Zone (APZ), depicted on submitted plans, which meets the defined requirements. **OR** Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m^2.	✓	☐	☐	The APZ is a low fuel area immediately surrounding a habitable or specified building (see specifications in Appendix 4). All requirements in A2.1 are essential and must be achieved to ensure compliance. If the implementation of protection zones was to result in the loss of vegetation that is not acceptable or causes conflict with landscape and environmental objectives, then the development may need to be modified.	The proposed development meets the acceptable solution: • It is possible to establish and maintain an APZ that meets all specified requirements. • By incorporating an APZ, to the extent possible within the boundary of the lot, into the landscaping surrounding the proposed building works and maintaining it to comply with specified requirements into the future; and • The extent of the achievable APZ results in the potential radiant heat impact of a fire on the building not exceeding 29kW/m^2; and • By constructing the future building works to the standard corresponding to the determined BAL rating as per *AS3959*; and • Maintaining firebreaks and fuel loads as per the local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.

Bushfire Protection Criteria - Element 2 - Siting and Design of Development – (continued)					
Acceptable Solution (either or both solutions to be met to the extent that it satisfies Element 1)	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
	Yes	**No**	**N/A**		
A2.2 **Hazard Separation Zone (HSZ)** Every building and its contiguous APZ is surrounded by a minimum 80 metre wide Hazard Separation Zone (HSZ), depicted on submitted plans, that meets the defined requirements. **OR** A HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location and the determined BAL does not exceed BAL-29.	✓	☐	☐	Hazard separation should be provided between extreme bushfire hazards and buildings to create a combined separation distance of 100m (50m for unmanaged grassland) in order to protect them from burning embers, radiant heat and direct flame contact (specifications in Appendix 4). The minimum hazard separation distance may be reduced by compliance with *AS 3959* which requires that as the distance from the vegetation is reduced, the construction standard must be increased.	The proposed development meets the acceptable solution by: • It is possible to cite buildings within the proposed development so that they do not exceed BAL-29; and • The construction standards of the proposed building being increased to meet the requirements corresponding to the determined Bushfire Attack Level (BAL), as per *AS 3959-2009*.

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 (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 Solutions	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
	Yes	**No**	**N/A**		
A3.1 **Two access routes**	✓	☐	☐	Two different vehicular access routes are provided, both of which connect to the public road network, provide access and egress to two different destinations and are available to all residents and the public at all times and under all weather conditions. Two way access should be provided as a public road, however, where a public road cannot be provided (this will need to be demonstrated by the proponent providing justification) an emergency access way may be considered.	Masonmill Road provides two points of access and egress from the subject property to two different destninations.
A3.2 **Public Road**	☐	☐	✓	A public road is to meet the technical requirements set out in Appendix 5.	N/A
A3.3 **Cul-de-sacs** (including dead-end roads)	☐	☐	✓	Should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent) they must be constructed to meet the technical requirements (set out in Appendix 5) including a maximum length of 200m (possibility of 600m if cul-de-sacs joined by emergency access way).	N/A
A3.4 **Battle Axe**	☐	☐	✓	Should be avoided in bushfire prone areas. If no alternative exists (this will need to be demonstrated by the proponent) they must be constructed to meet the technical requirements set out in Appendix 5.	N/A

Bushfire Protection Criteria - Element 3 - Vehicular Access - (continued)					
Acceptable Solutions	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
	Yes	**No**	**N/A**		
A3.5 **Private Driveways**	✓	☐	☐	Must be constructed to meet the design requirements set out in the Guidelines. Where a house site is further than 50m from a public road there are additional technical requirements - see Appendix 5.	The technical requirements as set out in Table 4 of the Appendices of the *Guidelines for Planning in Bushfire Prone Areas* (2015: 64) will be met.
A3.6 **Emergency Access Way**	☐	☐	✓	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) an emergency access way is to be provided as an alternative link to a public road during emergencies (maximum length of 600m) and must be constructed to meet the technical requirements set out in Appendix 5.	N/A
A3.7 **Fire Service Access Routes** (perimeter roads)	☐	☐	✓	Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes. They must be constructed to meet the technical requirements set out in Appendix 5.	N/A
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.	The site will comply with the local government annual firebreak notice.

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 (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 Solutions	**Compliance**			**Explanation / Requirements**	**Statements of Project Compliance and Justification**
	Yes	**No**	**N/A**		
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.	☐	☐	✓	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. The technical requirements set out in the 'Guidelines' (refer to Appendix 6) and any local government variation must be met (s8.4).	A reticulated water supply is not currently available to the site. The closest hydrant is located on the corner of Carmel Road and Canning Road, 825 metres north of the subject site.
A4.2 **Non-reticulated Areas** 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. (Note: **A4.3** is only for use if creating one additional lot and cannot be applied cumulatively). The technical requirements set out in the 'Guidelines' (refer to Appendix 6) and any local government variation must be met (s8.4).	Lot 1107 has 4 large water tanks holding in excess of 250,000 litres of stored water for firefighting purposes. These have appropriate couplings to allow fire appliances to access them. The turn-around area adjacent to these tanks is 13m in diameter and will be increased to 17.5m in diameter, to allow appropriate access for a 3.4 firefighting appliance.
A4.3 **Non-reticulated Areas (Individual Lots)** Single lots above 500 m^2 need a dedicated static water supply on the lot that has the effective capacity of 10,000 litres.	✓	☐	☐		

6 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).

6.1 Native Vegetation and Re-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
Reduce lot yield	N/A
Cluster development	N/A
Construct building to a higher standard as per BCA and AS 3659	N/A
Modify the development location	N/A
Comments:	

Does this planning proposal satisfy bushfire protection requirements 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?	N/A

Where, as part of the Proposal, revegetation of waterway foreshore, wetland or coastal buffers is necessary for their protection or management, this bushfire management plan will need to assess the ability and practicality of maintaining vegetation separation distances corresponding to determined BAL's.

Re-vegetation of riparian and/or coastal areas is part of this Proposal. Can the required BAL separation distance be maintained into the future?	N/A
Have any other landscape plans applying to this Proposal been considered in assessing the potential change in bushfire risk into the future	N/A

If any of the above applies, further information is presented in Section 7 'Bushfire Risk Management Measures'.

7 Bushfire Risk Management Measures

7.1 Siting of Buildings and Allowable BAL's

Future buildings on the proposed lots 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 and subject to a maximum Bushfire Attack Level of BAL-29.

The proposed development is unlikely to be approved if the assessed BAL rating is either BAL-40 or BAL-FZ, as this is unacceptable on planning grounds. The exception will be if it meets the definition of minor or unavoidable development.

The assessment for this proposal is detailed in Section 5 of this Plan which includes how the intent will be met in Section 5.5 'Bushfire Protection Criteria – Assess and Demonstrate Compliance'. The assessment of the subject property has identified an area of the property where buildings can be located to BAL-29 or lower.

7.2 Vegetation Management

An Asset Protection Zone (APZ) creating a low fuel area will be incorporated into the landscaping surrounding any future buildings (refer to Appendix 4 for specifications). This will decrease the potential bushfire intensity, minimise the likelihood of direct flame contact and reduce the exposure of the buildings to radiant heat. It will also be important for firefighter and occupant's safety during fire suppression activities.

Where possible a Hazard Separation Zone (HSZ) will also be established (refer to Appendix 4 for specifications). If this is not practical or achievable then any proposed construction will meet the standard appropriate to the BAL for that location (refer to Section 7.5).

At least the stated minimum separation distance from any classified vegetation, that corresponds to a particular lot's assessed BAL, will be maintained as either a non-vegetated area or as low threat vegetation managed in 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 (e) and (f) (refer Appendix 3 of this Plan).

Where the existing or planned re-vegetation has been assessed as "low threat" (meeting AS 3959-2009 Section 2.2.3.2 requirements), excluded from classification and directly resulted in the assessed BAL for a given lot or building being BAL-LOW, then this area will be managed to continue to meet those requirements and BAL rating.

Any classified vegetation that has directly contributed to the determined BAL rating for a given lot or building, will be managed such as to not change that vegetation to a higher risk classification.

The requirements of the local government's annual firebreak notice will be complied with.

7.3 Vehicular Access

The necessary requirements to allow safe private and emergency vehicles access and egress in the subdivision/development at all times will be established. These requirements and actions have been detailed in Section 5.4 of this Plan. Private driveways on the subject property will need to be upgraded and constructed to the standard outlined in Table 4 of the Appendices of the *Guidelines for Planning in Bushfire Prone Areas* (2015: 64)

7.4 Firefighting Water Supply

The required water tanks with appropriate couplings are installed and will be maintained such that the development is provided with a permanent and secure water supply that is sufficient for firefighting purposes. Access to these tanks needs to be upgraded to meet the standard as detailed in Appendix 6 and Section 5.5 of this Plan.

7.5 Required Building Construction Standards

The future residential buildings (Class 1, 2, 3 and associated Class 10a buildings and decks) in this Proposal will be subject to a Bushfire Attack Level greater than BAL-LOW as the required separation distances from classified vegetation are unable to be met.

As a result the future residential buildings in this Proposal will be constructed to the requirements corresponding to their assessed BAL as set out in *AS 3959-2009 Construction of buildings in bushfire prone areas* or *(NASH) Standard – Steel Framed Construction in Bushfire Prone* Areas (for Class 1a and 1b buildings).

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.

7.6 Existing Habitable Buildings on Subject Site

For any existing structures, within designated bushfire prone areas, the building standards are generally not retrospective. Complying with the required construction standards corresponding to a determined BAL, can only be a recommendation in order to improve the buildings performance when subject to a bushfire attack.

To improve the bushfire resistance of the existing building/s it is recommended to lower the BAL rating by increasing the separation distance between the building and the areas of classified vegetation determining the BAL rating (refer Section 5.3.4). The target BAL and the required separation distances are presented below.

HOUSE - TARGET BAL	Vegetation Area					
	1	**2**	**3**	**4**	**5**	**6**
Assessed separation distance (m)	94	152	106	178	48	15
Assessed BALs	BAL-12.5	BAL-LOW	BAL-LOW	BAL-LOW	BAL-12.5	BAL-FZ
Target Building BAL	BAL-29					
Minimum required separation distance (m)	42	21	33	22	10	21
Is removal of vegetation required to achieve the "Target" BAL?	No	No	No	No	No	Yes

Notes:

1. *A target 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.*
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 Bushfires Act 1954.*

8 Statements of Proposal Compliance and Justification

Appendix 1 sets out and summarises the key purpose of the applicable policies, guidelines, regulations, documents, and associated bushfire risk assessment tools that form the WA framework for bushfire risk management.
The content of this Bushfire Management Plan will reference and where applicable, comply with these. This section of the Plan contains the statements of compliance and justification against these requirements.

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

SPP 3.7 Objectives and Justification for Compliance Response		Proposal Meets Objective
5.1	Avoid any increase in the threat of bushfire to people property and infrastructure	**Yes**

Implementation of the bushfire risk management measures as set out in this Plan, including meeting the requirements of the bushfire protection criteria; will avoid any increase in the threat of bushfire.

5.2	Identify and consider bushfire risks in decision-making at all stages of the planning and development process (to reduce vulnerability to bushfire).	**Yes**

The bushfire risks have been identified and assessed, as relevant for the stage of this planning submission, using the tools prescribed in *SPP 3.7* (and the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*). Refer to Section 5 'Assessment of Bushfire Risk'.

5.3	Ensure that all stages of planning submissions take into account bushfire protection requirements and include specified bushfire protection methods.	**Yes**

The bushfire protection requirements and any specified protection methods, relevant for the stage of this planning submission, have been taken into account and presented in Section 6 'Bushfire Risk Management Measures'.

5.4	Achieve an appropriate balance between bushfire risk management measures; biodiversity conservation values; environmental protection and biodiversity management; and landscape amenity, with consideration of climate change.	**Yes**

The components of this objective have been considered along with the requirements set out in the 'Guidelines' s2.3. Identifying and addressing issues relevant for the stage of this planning submission is presented in this Plan in Section 6 'Environmental Considerations'.

SPP 3.7 Policy Measures and Justification for Compliance Response		Proposal Compliant
6.1	Higher order strategic planning documents in bushfire prone areas	**N/A**
6.2	Strategic planning proposals, subdivision and development applications (given the assessed bushfire risk, the application may be considered for approval where it can be undertaken in accordance with policy measures 6.3, 6.4 or 6.5 i.e. provide required information).	**Yes**

The proposal relates to land that has a BHL of low and a BAL above BAL-Low **BUT** has or will on completion be subject to a BAL of less than BAL-29.

6.3	Information to accompany strategic planning proposals	**Yes**

A Bushfire Hazard Level assessment, BAL Assessment and BAL contour map are included as part of this BMP.

6.4	Information to accompany subdivision applications	**N/A**
6.5	Information to accompany development applications	**N/A**
6.6	Vulnerable or high risk land uses.	**N/A**
6.7	Strategic planning proposals, subdivision or development applications in areas where an extreme BHL and/or BAL-40 or BAL-FZ applies	**N/A**
6.8	Advice of State/relevant authority/s for emergency services to be sought	**N/A**

SPP 3.7 Policy Measures and Justification for Compliance Response		Proposal Compliant
6.9	Advice of State/relevant agencies/authorities for environmental protection to be sought	**N/A**
6.10	Bushfire conditions may be imposed	**N/A**

8.2 Guidelines for Planning in Bushfire Prone Areas (WAPC 2015 as amended)

The 'Guidelines' are designed to assist in the interpretation of SPP3.7's objectives and policy measures. As such they have been referenced and complied with in compiling this Bushfire Management Plan which is to accompany the planning submission. This Plan contains, as a minimum, the information required as per the 'Guidelines' checklist.

8.3 Bushfire Protection Criteria (WAPC 2015 'Guidelines')

The proposed land use has been assessed against the bushfire protection criteria. The assessment of the bushfire risk management measures (i.e. those relevant to each element) and the demonstration of how the proposal meets the criteria are presented in Section 5.5 of this Plan - 'Bushfire Protection Criteria - Assess and Demonstrate Compliance'.

Where the proposal has not been able to fully meet an acceptable solution for a given element or an alternative solution is proposed, then Section 7 'Risk Management Measures', demonstrates how the Proposal will comply with the performance principle and the intent of that element. Any required advice and recommendations from DFES and other referral authorities will be included in this section. A summary of the outcome is presented below.

Bushfire Protection Criteria Element	Basis of Proposal Assessment			Proposal Satisfies All Criteria
	Acceptable Solutions	Performance Principle		
		Variation on Acceptable Solutions Justification presented in Section 7	Alternative Solution Presented in Section 7. Includes advice from the relevant referral authorities	
Location	✓			Yes
Siting and Design of Development	✓			Yes
Vehicular Access	✓			Yes
Water	✓			Yes

8.4 Local Variations to Bushfire Protection Criteria

Are there any endorsed local variations to the bushfire protection criteria (e.g. through a local planning policy) that are to apply to the proposed land use and therefore addressed in Section 7 'Bushfire Risk Management Measures' of this Plan?	No
Does the proposal satisfy the local variations to the bushfire protection criteria?	N/A

8.5 WA Building Act 2011

Relevant regulations associated with the Act are the *Building Regulations 2012* and the *LPS Amendment Regulations 2015*. The legislation also adopts the Building Code of Australia as the minimum technical requirements for the design and construction of buildings and certain other structures in WA.

Is this planning submission a required development application for construction of any Class of building?	No

If the response is 'No', then this planning submission is for a planning stage where direct compliance with the Act for the land use proposal is not required. However, the BAL Contour Map and/or the BAL

assessment contained in this Plan will apply for any future planning application at the applicable planning stage i.e. construction of buildings.

If the response is 'Yes', then one of the situations below will apply to this proposal.

This Planning Submission – the Land Use Proposal	Applicable
A proposal for a single house or ancillary dwelling (Class 1 and associated Class 10a building or deck) located in a bushfire prone area on a lot less than 1100m2 or on a lot equal to or greater than 1100m2 but subject to a BAL of BAL-29 or less, does not need to lodge a development application (rather it goes direct to the Building Permit Process). However, the relevant local government additionally requires a development application to be submitted for planning approval. Bushfire construction requirements will apply in both cases.	No
A proposal for a single house or ancillary dwelling (Class 1 and associated Class 10a building or deck) located in a bushfire prone area on a lot equal to or greater than 1100m2 but subject to BAL-40 or BAL-FZ must lodge a development application and bushfire construction requirements will apply.	No
A proposal, regardless of lot size, for residential or accommodation buildings, other than a house (i.e. Class 2 or 3 and associated Class 10a building or deck), located in a bushfire prone area, must lodge a development application and bushfire construction requirements will apply.	No
A proposal, regardless of lot size, for mixed use, commercial, industrial buildings or public facilities (i.e. Class 4-9 buildings), located in a bushfire prone area, must lodge a development application and bushfire construction requirements will not apply (unless the local government additionally requires them to apply).	No

This Proposal complies with the *WA Building Act 2011* and associated regulations by creating a BAL Contour Map and conducting a bushfire attack level assessment (refer Section 5 of this Plan 'Assessment of Bushfire Risk') and noting the obligation for buildings to be constructed to the standard corresponding to the determined bushfire attack levels in Section 9 of this Plan 'Responsibilities for Implementation and Maintenance'.

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

This Proposal complies with the methodology set out in *AS 3959* to classify vegetation that is a bushfire threat and to calculate the bushfire attack levels presented as a BAL Contour Map and/or a BAL assessment in Section 5 of this Plan 'Assessment of Bushfire Risk'.

For the construction of applicable buildings this land use proposal will comply with the construction requirements, set out in *AS 3959,* that correspond to the determined bushfire attack level/s for the

subject site. This obligation is stated in Section 9 of this Plan 'Responsibilities for Implementation and Maintenance'.

8.7 Local Government Fire Break Notice

This Proposal complies with the requirements of the relevant local government by stating the landowner's obligations in Section 9 of this Plan 'Responsibilities for Implementation and Maintenance.' Additionally the obligation is noted as part of meeting the requirements of the bushfire protection criteria Section 5.5 'Element 2 – Siting and Design'.

8.8 Other Applicable Local Government Documents

This Plan provides the required information such that this Proposal can comply with the requirements of:

- The Local Planning Scheme provisions with respect to bushfire risk management

9 Responsibilities for Implementation & Maintenance

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'.

9.1 Landowner / Proponent Responsibilities (and those acting on their behalf)

Implementation

- Ensure anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information (future landholders if the Plan was prepared as part of a subdivision application), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).

- Construction of private driveways and battle axes must comply with the standards (Appendix 5 'Vehicular Access')

- For a non-reticulated water supply, ensure that the emergency water supply structure for firefighting purposes (tanks, couplings and access) is constructed to comply with the standards (s7.4 'Fire Fighting Water Supply' and Appendix 6 'Water').

- Implement the low fuel Asset Protection Zone (APZ) and where applicable the Hazard Separation Zone (HSZ) as per s7.2 'Vegetation Management' and Appendix 4 'APZ and HSZ'.

- Ensure all new buildings the landowner/proponent has responsibility for, are designed and constructed in full compliance with the requirements of the WA Building Act 2011 and the referenced Building Code of Australia; and additional requirements of the local government. This will include compliance with AS 3959-2009 *3959 Construction of Buildings in Bushfire Prone Areas* (2009 as amended) and/or the National Association of Steel Housing – *(NASH) Standard – Steel Framed Construction in Bushfire Prone Areas,* whereby construction standards corresponding to the assessed BAL will be applied (Appendix 2 'Bushfire Risk Assessment – Methodology Explained').

Maintaining Compliance

- Ensure the ongoing review and implementation of the Plan to ensure that the bushfire risk management measures remain effective. This includes amending the Plan to detail changes with any future development ('Guidelines s4.6.4)

- Respond to and comply with fire protection or hazard management notices issued by the local government. This includes compliance with the Shire of Kalamunda Fire Break Notice issued under s33 of the Bushfires Act 1954 as directed by the 'Guidelines' s6.1 and referenced in this Plan s5.5 'Bushfire Protection Criteria', s8.7 'Local Government Firebreak Notice' and Appendix 4 'APZ and HSZ'. View the current requirements on the Shire of Kalamunda website.

- Maintain the low fuel Asset Protection Zone (APZ) and where applicable the Hazard Separation Zone (HSZ) as per s7.2 'Vegetation Management' and Appendix 4 'APZ and HSZ'.

- At least the stated minimum separation distance (refer to s5.4) from any classified vegetation, that corresponds to a particular lot's assessed BAL, must be maintained as either a non-vegetated area or as low threat vegetation managed in 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 (e) and (f)* (refer to Appendix 3 of this Plan 'Vegetation Classification Exclusions').

- If existing or planned re-vegetation has been assessed as "low threat" (meeting *AS 3959-2009 Section 2.2.3.2* requirements), excluded from classification and directly resulted in the assessed BAL for a given lot or building being BAL-LOW – then this area must be managed to continue to meet those requirements and BAL rating.

- Any classified vegetation that has directly contributed to the determined BAL rating for a given Lot or building, must be managed such as to not change that vegetation to a higher risk classification.

- For a non-reticulated water supply, ensure that the emergency water supply (tank) for firefighting purposes is maintained in good condition and has the specified couplings (s7.4 'Fire Fighting Water Supplies' and Appendix 6 'Water').

- The landowner/occupier has responsibility for water tank/s on a single lot for the purposes of firefighting. A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times. This could be in the form of an agreement with the local government and the fire service ('Guidelines' Appendix 6 'Water', this Plan s7.4 'Fire Fighting Water Supplies').

9.2 Builder Responsibilities

The builder (generally named on the building permit) is responsible for ensuring that the building or incidental structure to which a building permit applies is, on completion, compliant with the Building Code of Australia (BCA).

For Classes 1a, 1b, 2, 3 and associated 10a buildings or decks located in a designated bushfire prone area, compliance with the BCA requires that these buildings are constructed to the requirements corresponding to their bushfire attack level rating.

The construction standards for Class 1a and 1b buildings are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas; or*
- National Association of Steel Housing – *(NASH) Standard – Steel Framed Construction in Bushfire Prone Areas*.

The construction standards for Classes 2, 3 and associated 10a buildings or decks are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas*

The building/s must also comply with any additional local government requirements.

9.3 Local Government Responsibilities

Implementation

- For Proposals that do not comply with the acceptable solutions of the bushfire protection criteria, the local government request a performance based assessment, liaising with the Department of Fire and Emergency Services for advice ('Guidelines' s6.2).

- Referring proposals that have significant environmental implications to the Environmental Protection Authority; and proposals abutting Department of Parks and Wildlife (DPAW) managed land to DPAW; and proposals abutting waterways or which have other water resource implications to the Department of Water

- Providing advice where the clearing of locally significant vegetation is proposed

- Local government to register this Bushfire Management Plan and keep a record of the sites referred to for the purpose of identify servicing and infrastructure gaps. ('Guidelines' s4.6.4).

Maintaining Compliance

- Develop and maintain district bushfire fighting services and facilities.

- Any existing and planned revegetation areas that have been assessed in this Plan to have:

    1. Met the Australian Standard *AS 3959-2009 s2.2.3.2 (f)* requirements and has been excluded from classification (refer to Appendix 3 'Vegetation Classification Exclusions'); and

    2. Has directly resulted in the assessed BAL-LOW rating and/or forms part of the minimum required classified vegetation separation distance that that corresponds to a particular structure's assessed BAL; and

    3. Is an area whose maintenance is the responsibility of the Local Government (i.e. the subject land is vested in the control of the local government - 'Guidelines s6.2); such areas of vegetation must be maintained to be low threat as specified in *AS 3959-2009 Section 2.2.3.2* (refer to Appendix 3 'Vegetation Classification Exclusions').

10 Appendices

Appendix 1
The WA Framework for Bushfire Risk Management

This section of the Bushfire Management Plan sets out the applicable policies, guidelines, regulations, documents, and associated bushfire risk assessment tools, that a Bushfire Management Plan will need to reference and where applicable, comply with.

Statements of compliance against these requirements are presented in Section 8 of this Plan.

Background

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***.

As part of the ***Planning and Development Act 2005*** the *Planning and Development (Local Planning Schemes) Regulations 2015* have been amended (*LPS Amendment Regulations 2015*) to introduce 'Part 10A Bushfire risk management' which establishes the ***deemed bushfire provisions*** (being the parts of Clause 78).

The ***deemed bushfire provisions*** provide a mechanism to require a development approval and apply to all local planning schemes prepared under the ***Planning and Development Act 2005***, to ensure that bushfire risk is appropriately managed in new development throughout the state.

The ***deemed bushfire provisions***:

- Only apply to development that is proposed on a site in a designated bushfire prone area.
- Can be supplemented by a local planning scheme may but not varied or exempted.
- Are applied and work through the following policies, guidelines, regulations 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 2015 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; and
- 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 2015)* 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 2015 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:

- Bushfire Hazard Level assessment;
- Bushfire Attack Level (BAL) Contour Map;
- Bushfire Attack Level (BAL) assessment;
- Bushfire Protection Criteria; and
- 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.
- The majority of 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 particular construction details for buildings to reduce the risk of ignition from a bushfire, appropriate to the:

a) Potential for ignition caused by burning 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 ***Fire Break 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 e.g. Shire of Mundaring Local Natural Areas
- 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 2015*) 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

"A Bushfire Hazard Level assessment provides a 'broad-brush' means of determining the potential intensity of a bushfire for a particular area. The Bushfire Hazard Level assessment assists in informing the suitability of land contained within strategic planning proposals for future subdivision and development The Bushfire Hazard Level assessment categorises land within a designated bushfire prone area as having a low, moderate or extreme bushfire hazard level. Different hazard levels may be assigned to different parts of individual lots ('Guidelines' s4.1)".

The hazard levels are assessed primarily based on defined fuel characteristics. These characteristics include:

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

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.

Method 1 – Summarised Procedure

- Determination of the area to be assessed
- Determine predominant vegetation type(s) within 100 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 BALs - Forest Fire Danger Index (FFDI) of 80 is used for WA

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**
BAL - LOW	There is insufficient risk to warrant specific construction requirements but there is still some risk.	4
BAL - 12.5	There is risk of ember attack. 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 some likelihood of 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

Method 2 – Summarised Procedure

- Determine the relevant FDI or wind speed
- Determine classified vegetation type(s), height and fuel loads
- Determine the effective slope under the classified vegetation
- Determine the slope of the land between the site and classified vegetation
- Determine the distance of the site from classified vegetation
- Calculate the flame length and determine the flame width
- Determine the elevation of receiver/buildings
- Calculate the radiant heat flux
- Determination of BALs - Forest Fire Danger Index (FFDI) of 80 is used for WA

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 the bushfire attack for example short cropped grass to 100mm), maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

Appendix 4
Technical Requirements – Bushfire Protection Criteria (APZ & HSZ)

A vital and effective component of managing the potential bushfire risk to people, property and infrastructure is creating bushfire protection zones in which fire fuel loads are reduced and maintained. They are an integral part of subdivision and development design and appropriately designed will greatly assist with bushfire prevention and suppression operations.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015, Appendix 4)* set out the requirements to create an Asset Protection Zone (APZ) and a Hazard Separation Zone (HSZ). The aim of these bushfire protection zones is to have a fire of diminishing intensity and flame length as it approaches development. These reduced fuel loads will reduce the intensity of radiant heat onto the buildings, thereby increasing their survivability.

The APZ is a low fuel area immediately surrounding a habitable or specified building and is designed to prevent direct flame contact with buildings and it improves safety for firefighters and occupants during fire suppression activities. Maintaining this zone in a minimal fuel condition is essential and firefighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

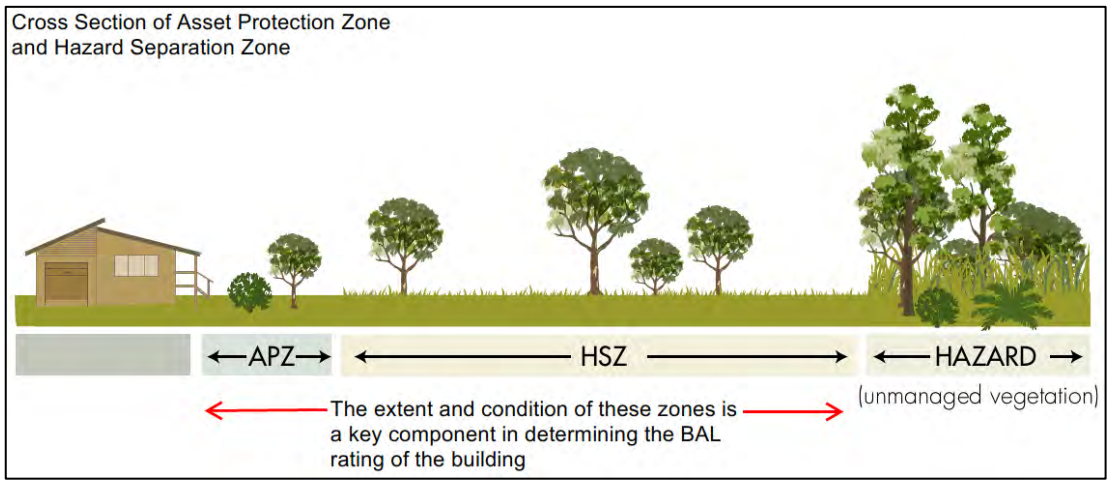
Asset Protection Zone (APZ) Requirements (source: 'WAPC Guidelines')

- **Width:** 20 metres measured from any external wall of the building or building envelope. Where the slope increases above 10^0, the APZ should be increased to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m^2 (i.e. a BAL-29 rating on the building).
- **Location:** the APZ should be accommodated within the boundaries of the lot on which the building is situated. Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m^2 (i.e. a BAL-29 rating on the building).
- **Fine Fuel Load:** reduced to and maintained at 2 t/ha. (DFES guidance-keep grasses short, remove leaves, twigs, dead material within shrubs and trailing bark, and prune branches to 2 metres above the ground).
- **Trees:** crowns are a minimum distance of 10 metres apart (a small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species) and no crowns overhang the building.
- **Shrubs/Trees:** no tall shrubs or tree foliage within two metres of a building
- **Sheds and Fences:** within the APZ are constructed using non-combustible materials (e.g. iron, brick, limestone, metal post and wire) and sheds do not contain flammable materials.

Additional DFES Guidance

a) Do not clump shrubs close to a building. Ensure there is a gap between shrubs and buildings of three times their mature height.
b) Store firewood at least 20 metres away from the building.
c) Keep gutters free of leaves and other combustible material.

d) Roof mounted evaporative coolers to be fitted with ember screens.
e) Gas cylinders to vent away from a building and be tethered to prevent falling over.
f) Driveways and access ways must allow for safe passage of a fire appliance to all buildings on the land.
g) Land owners/occupiers must maintain compliance with the local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.
h) Barriers such as driveways, lawns, ovals, orchards and pathways surrounding dwellings can form part of a APZ. Locate them to maximise building protection.



Hazard Separation Zone (HSZ) Requirements (source: 'WAPC Guidelines')

The 'Guidelines' set out the requirement for a physical separation between extreme bushfire hazard areas and development in low and moderate hazard areas both around and within subdivisions.

- **Width:** a minimum of 80 metres measured from the outer edge of the APZ for any vegetation classified in AS3959 as forest, woodland, closed shrub, open shrub, mallee/mulga and rainforest OR 30 metres, measured from the outer edge of the APZ, for unmanaged grassland.
- **Location:** within the boundaries of the lot on which the building is situated or, where this is not possible or desirable, within the boundaries of the development precinct in which the building is proposed to be located.
- **Fine Fuel Load:** dead material <6mm diameter and live material <3mm is to be reduced to and maintained at 5 - 8 t/ha for jarrah/marri dominated forest and woodlands, below 12 -15 t/ha in mallee heath and below 15 t/ha in karri forest.
- **Exception -** a HSZ may not be required if the proposed construction meets the standard appropriate to the assessed BAL for that location/building and that BAL does not exceed BAL-29.

The intent is to create a combined minimum separation distance of 100 metres between the buildings and the hazard (50 metres if unmanaged grassland). This separation distance may be reduced if the development is compliant with AS 3959 (i.e. as the distance from classified vegetation is reduced, the construction standard must be increased) or by using a performance principle assessment.

Appendix 5
Technical Requirements - Bushfire Protection Criteria (Vehicular Access)

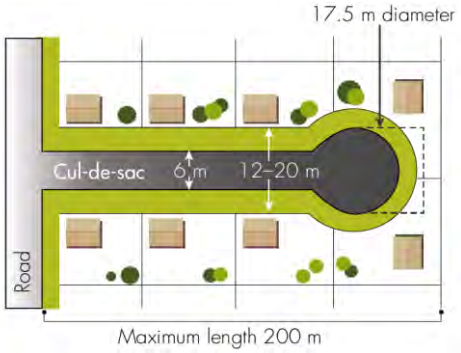
Vehicular Access – Technical Requirements of Acceptable Solutions - Part 1

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*

A3.3 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:

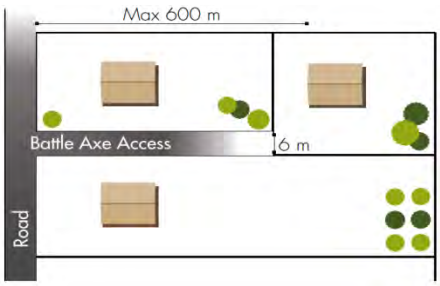
- Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length; and
- Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely; and
- 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.



A3.4 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.



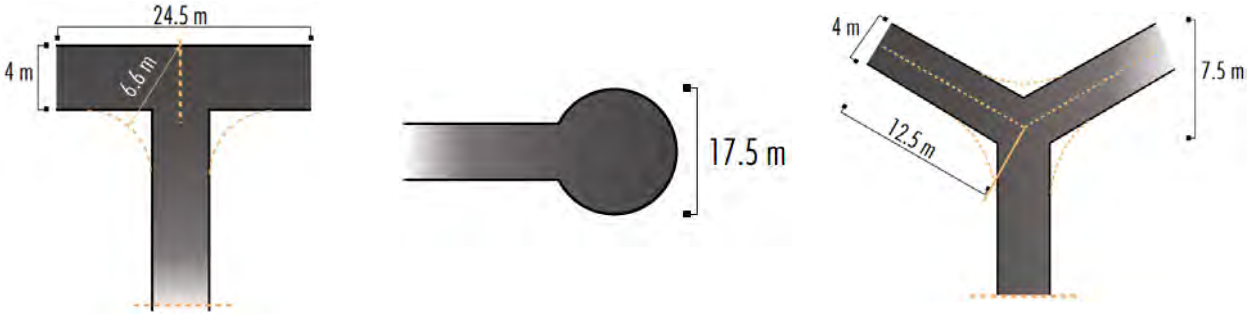
A3.5 Private Driveways

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:

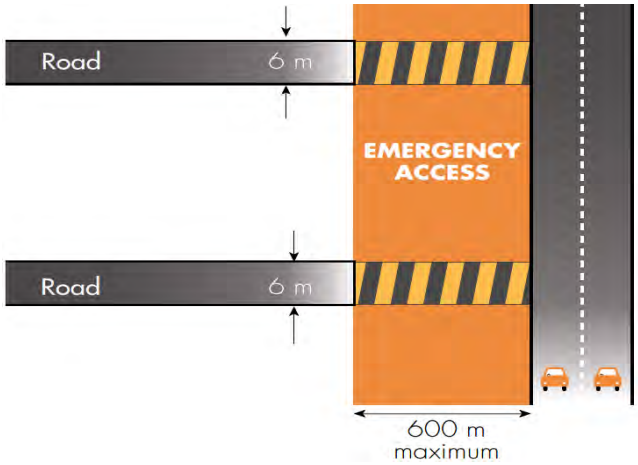
- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres); and
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres); and
- 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).



A3.6 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; and
- Must be signposted including where they ajoin public roads; and
- Provided as a right of way or public access easement in gross; and
- 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.



A3.7 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; and
- Dead end roads not permitted; and
- Allow for two-way traffic (i.e. two 3.4 fire appliances); and
- 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); and
- All weather surface (i.e. compacted gravel, limestone or sealed) and have erosion control measures in place; and
- Must be adequately sign posted; and
- 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; and
- 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 2015*					
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	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum 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 metre wide paving and one metre wide 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.

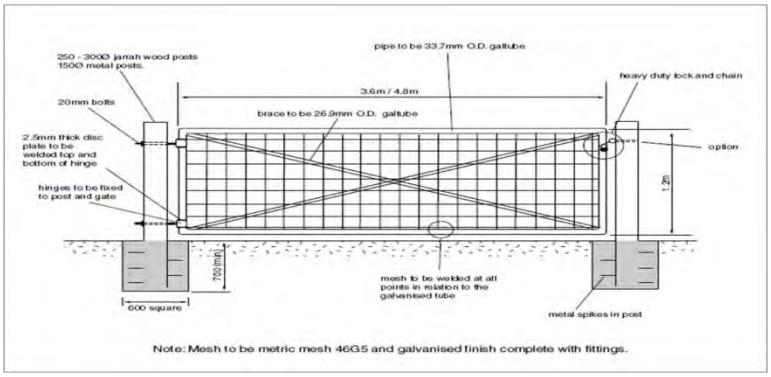
Vehicular Access - Technical Requirements of Acceptable Solutions

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 2015* and DFES website

A4.1 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 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.

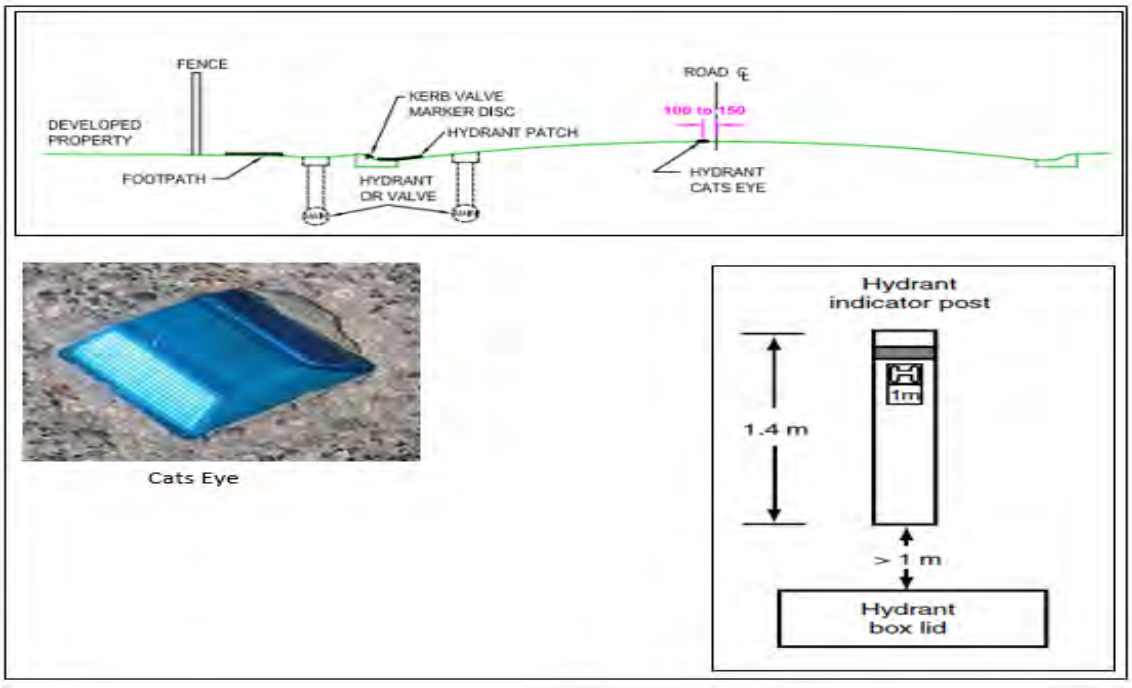


Figure A4.1: Hydrant Location and Identification Specifications

A4.2 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 2015) 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 s7.4.

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 furthermost 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 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. This could be in the form of an agreement with the local government and the fire service.

A4.3 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 2015 Appendix 4)*.

Single lots above 500 m^2 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 2015)*.

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 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. This could be in the form of an agreement with the local government and the fire service.

Recommended coupling 50mm