




Reference number 2752

Member of the Fire Protection Association of Australia

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## **Lot 6, DP 31216, 48 Beacon Avenue, Beacon Hill, NSW 2100.**

**Monday, 17 February 2020**

Prepared and certified by:	Matthew Willis <b>BPAD – Level3 Certified Practitioner</b> Certification No: BPD-PA 09337		17/02/2020
Can this proposal comply with AS3959-2009 (inc PBP addendum 3)?	<b>Yes</b>		
What is the recommended AS 3959-2009 level of compliance?	<b>BAL-29</b>		
Is referral to the RFS required?	<b>Yes</b>		
Can this development comply with the requirements of PBP?	<b>Yes</b>		
Plans.	<b>Attached</b>		

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# **Bushfire Risk Assessment**

***Monday, 17 February 2020***

### **Contact**

*Richard Wulff*

*48 Beacon Ave*

*Beacon Hill NSW 2100*

*0414699370*

### **Subject Property**

*Lot 6, DP 31216*

*48 Beacon Avenue*

*Beacon Hill NSW 2100*

## BUSHFIRE RISK ASSESSMENT CERTIFICATE

**THIS FORM IS TO BE COMPLETED BY A RECOGNISED CONSULTANT IN BUSHFIRE RISK ASSESSMENT IN ACCORDANCE WITH SECTION 79BA 1(b) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 NO 203**

Property Address	Lot 6, DP 31216, number 48 Beacon Avenue Beacon Hill
Description of the Proposal	Alterations and additions to an existing dwelling
Plan Reference	Attached as appendix 1
BAL Rating	BAL-29
Does the Proposal Rely on Alternate Solutions?	Yes

**I, Matthew Willis of Bushfire Planning Services Pty Ltd** have carried out a bushfire risk assessment on the above-mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in Appendix 4 of Planning for Bushfire Protection 2006 together with recommendations as to how the relevant Specifications and requirements are to be achieved.

I hereby certify, in accordance with Section 79BA of the Environmental Planning and Assessment Act 1979 No 203:

1. That I am a person recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements\*

\*The relevant specifications and requirements being specifications and requirements of the document entitled Planning for Bush Fire Protection prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by Section 79 BA(1)(a) of the Environmental Planning and Assessment Act 1979 No 203.

I am aware that the Bushfire Assessment Report, prepared for the above-mentioned site is to be submitted in support of a development application for this site and will be relied upon by Northern Beaches Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with Planning for Bushfire Protection 2006.

<b>REPORT REFERENCE</b>	Monday, 17 February 2020
<b>REPORT DATE</b>	Monday, 17 February 2020
<b>CERTIFICATION NO/ACCREDITED SCHEME</b>	FPA A BPAD A BPD-PA 09337

### Attachments:

- Bushfire Risk Assessment Report
- Recommendations

**SIGNATURE:** ---  ----- **DATE:** -----Monday, 17 February 2020

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# 1 Executive Summary

Bushfire Planning Services has been requested by Mr Richard Wulff to supply a bushfire compliance report on lot 6, DP 31216, 48 Beacon Avenue, Beacon Hill.

The works proposed for the subject lot are for the alterations and additions to an existing dwelling, see attached plans for details.

The subject lot is on the south-eastern side of Beacon Avenue and at its closest point to the hazard the proposed new work has a separation distance to the east of approximately 87m.

The vegetation that is considered to be the hazard to this proposal is situated on land that slopes down slope away from the property at an angle of approximately 28.18° deg.

The slope beneath the hazard to this proposal is greater than the Deemed to Satisfy tables of AS3959-2009 resulting in the need to undertake a performance based assessment on this proposal.

For the purposes of this assessment this vegetation is considered to be Forest.

The remaining vegetation within the study area is contained within the boundaries of established residential allotments and is managed land and of low threat to this proposal.

The calculations and assumptions outlined in this report show that the development will be required to comply with the construction requirements of AS 3959-2009 BAL-29 on all aspects.

It is my considered opinion that this development can comply with the requirements of AS 3959-2009 and Planning for Bushfire Protection 2009.

Table 1 is a summary of the relevant findings of this assessment.

Aspect	North	East	South	West
<b>Vegetation type</b>	Managed land	Managed land/forest	Managed land	Managed land
<b>Slope</b>	N/A	Greater than 20 degrees	N/A	N/A
<b>Setback within lot 6</b>	N/A	6m	N/A	N/A
<b>Setback outside lot 6</b>	N/A	81m	N/A	N/A
<b>Total setback</b>	N/A	87m	N/A	N/A
<b>Bal level</b>	N/A	29	N/A	N/A

*Table 1 - Any aspect marked with "N/A" in the table above indicates that it is considered there is no hazard in that direction. Only the details for the aspect that is considered to be at the greatest risk from bushfire is shown in the table above. THIS TABLE IS NOT CONSTRUCTION ADVICE.*

## 2 General

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This proposal relates to the alterations and additions to an existing dwelling on the subject lot and its ability to comply with the rules and regulations for building in a bushfire prone area.

The methodology used on this report is based on Planning for Bushfire Protection 2006 (PBP) as published by the New South Wales Rural Fire Service.

Any wording that appears in *blue italics* is quotes from Planning for Bushfire Protection 2006. Some of the measurements used in this report have been taken from aerial photographs and as such are approximate only.

## 3 Block Description

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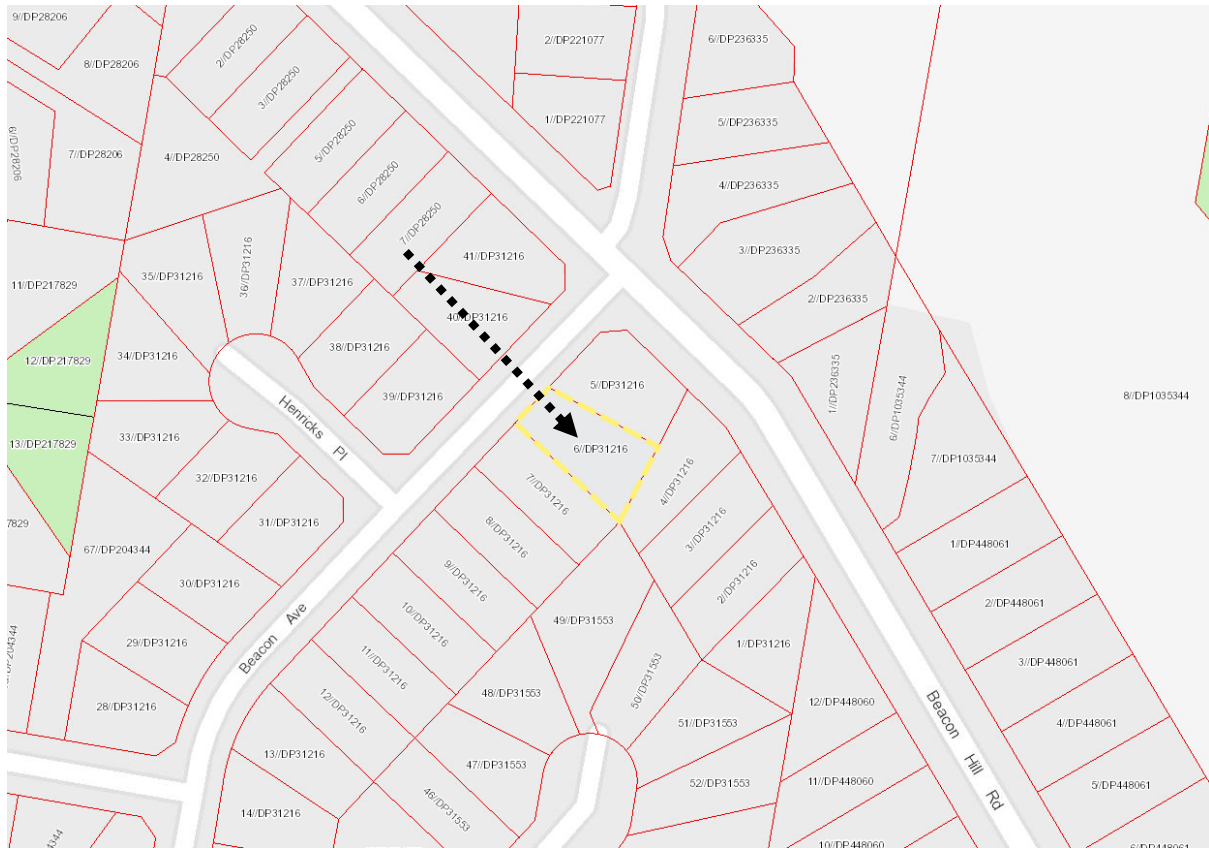
The subject block is situated on the south-eastern side of Beacon Avenue in an established area of Beacon Hill.

The lot currently contains a multi-level class 1a dwelling.

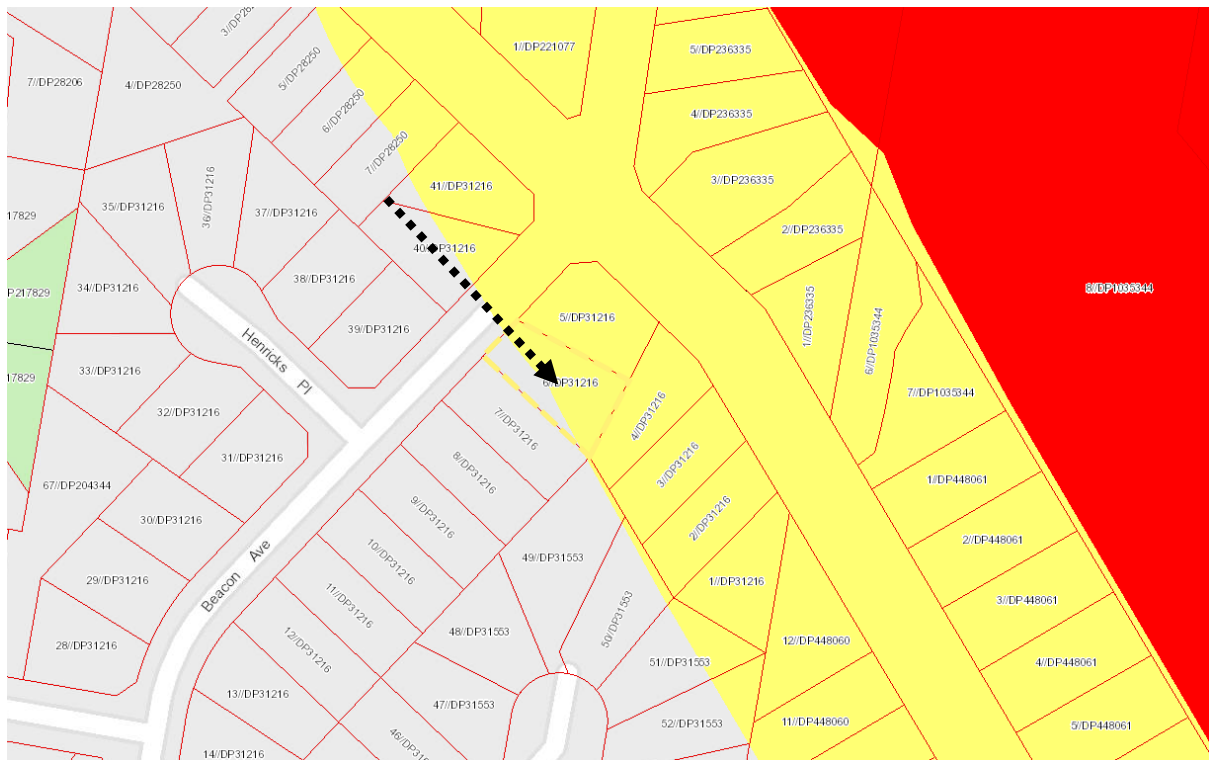
The lands surrounding the proposed site on the subject lot to a distance of at least 87m contain existing residential development and associated gardens or land that is otherwise not considered to be a significant bushfire hazard.

- Lot; 6
- DP; 31216.
- LGA; Northern Beaches.
- Area; 560.6m<sup>2</sup>.
- Address; 48 Beacon Avenue, Beacon Hill.

*This section has been left blank.*



*Map 1 shows the cadastral layout around the subject lot.*



*Map 2 is an extract from the councils' bushfire prone land map. The map shows lot 6 to be within the buffer zone of category 1 bushfire vegetation.*



## 4 Vegetation

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The study area for the vegetation is 140m surrounding the subject block.

The vegetation within the study area for this development is considered to be largely managed land.

The major potential hazard to this development is the vegetation within an area of undeveloped land to the east.

For the purpose of this assessment and compliance with AS3959 this area of undeveloped land is considered to be Forest and is the hazard to this proposal.



*Photo 1 - An overview of the vegetation within the general area.*

*This area has been left intentionally blank.*





*Photo 2 is a closer view of the vegetation in the area.*

Table 2 outlines the vegetation orientation and distance from the development area.

Aspect	North	East	South	West
<b>Vegetation type</b>	Managed land	Managed land/forest	Managed land	Managed land
<b>Setback within lot 6</b>	N/A	6m	N/A	N/A
<b>Off-site setback</b>	N/A	81m	N/A	N/A
<b>Total setback</b>	N/A	87m	N/A	N/A

*Table 2 - Any aspect marked with "N/A" in the table above indicates that it is considered there is none or only a secondary hazard in that direction.*

*This area has been left intentionally blank.*

## 5 Known constraints on subject block

I have not been informed or know of any places of cultural or environmental significance within the boundaries of the subject block.

Given the nature of the surrounding land it is considered highly unlikely that anything of significance will be affected by this development.

## 6 Slope

The slope of the land beneath the hazard that is most likely to influence bushfire behaviour has been calculated by topographical map analysis to a distance of 100m from the subject lot.

An extract of the topographical map for the area is shown below and the relevant slope analysis is shown in

Run	Starting height (m)	Finish height (m)	Length of run (m)	Height difference (m)	Slope (deg)
<b>Site slope</b>	106.73	97.53	80.22	-9.19	-6.54
<b>Effective slope</b>	97.26	37.04	112.45	60.22	-28.17





**Table 3**



Run	Starting height (m)	Finish height (m)	Length of run (m)	Height difference (m)	Slope (deg)
Site slope	106.73	97.53	80.22	-9.19	-6.54
Effective slope	97.26	37.04	112.45	60.22	-28.17

*Table 3 – The above details show the variables and outcomes use in each “run” as shown in the previous map.*

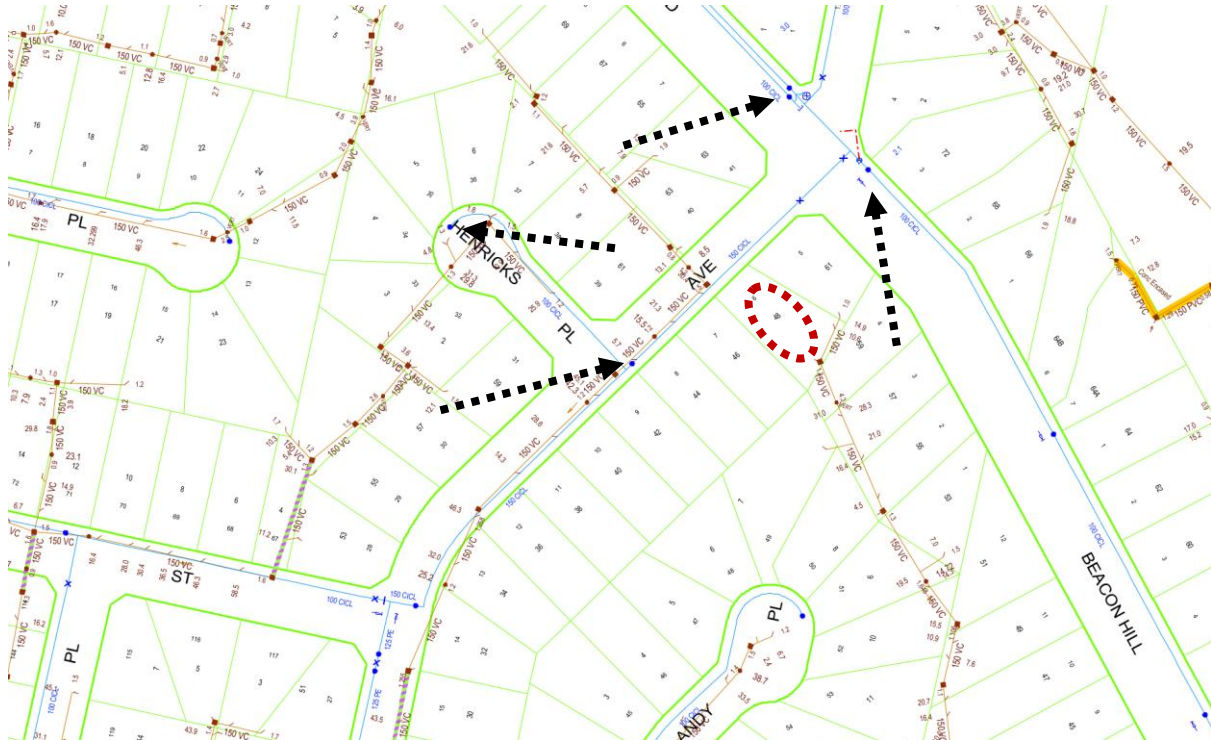
## 7 Utilities

### 7.1 Water

The subject block will be serviced by a reticulated water supply.



The following map is an extract from Sydney waters hydrant map. Hydrants are indicated by a blue dot on a blue line. As can be seen there is at least one hydrant point indicated within close proximity of the property.



## 7.2 Electricity

Mains electricity is available to the block.

## 7.3 Gas

It is unknown if either bottled or mains gas is to be altered or installed in this proposal.

## 8 Access/Egress

Access to the development site will be via a short private driveway from Beacon Avenue.

All roads in the vicinity are considered to be capable of carrying emergency services vehicles and pedestrian access onto the lot is also considered to be adequate.

## *Analysis of development and recommendation.*

## 9 Compliance with AS 3959-2009

The following variables were used in the calculations.

- Fire Danger Index – 100
- Effective Slope – 28 deg downslope.
- Site slope – 6.5° deg downslope
- Separation distance – 80m
- Wind Speed - 45 km an hour
- Elevation of Receiver – 2.8m
- Ambient Temperature - 308° kelvin.
- Flame temperature - 1090° kelvin.
- Relative humidity - 25%
- Vegetation Type -DSF as per PBP-2006.
- Surface and elevated fuel – 20 ton per hectare
- Overall fuel -25 ton per hectare

*This section has been left blank.*

Fully Developed Fire				Maximum View Factor and Corresponding Flame Angle			
Variable	Description	Value	Units	Fh	Flame height	7853397.4	m
	Forward Rate of Spread	16567.927	m/h		Default Elevation of Receiver	3926698.7	m
	Length/Breadth ratio	5.3671791				55.351164	m
	Head fire / backfire spread ratio	113.21761		$\alpha$	Flame angle	34	deg
	Full ellipse length	146.33701	m/h	$\alpha$	Flame angle	0.5934119	rad
	Full spread	16714.264	m/h	$\phi$	View factor	0.4392465	
	Ellipse breadth	3114.1619	m				
				L	Path length	34.111806	m
FDWf	Calculated Head Width	100	m		a0	9.050E-01	
					a1	-4.552E-03	
	Intensity	214772.8	kW.m		a2	4.768E-05	
FI	Flame length	110.70233	m		a3	-2.540E-07	
	Radiant heat	35.480766	kW.m <sup>2</sup>		a4	4.987E-10	
	Flank spread	1557.0809	m/h	$\tau$	Transmissivity	0.7957503	
	Flank spread	1.5570809	km/h				
					FDF Calculated Radiant Heat	26.576497	kW/m <sup>2</sup>

It is noted that the calculated flame length is greater than the available separation distance. This is not considered to alter the outcome of this assessment by raising the BAL to Flame Zone.



Planning for Bushfire Protection 2019 describes Flame Zone as “*The distance from a bush fire at which there is considered to be significant potential for sustained flame contact to a building. The flame zone is determined by the calculated distance at which the radiant heat from the design fire exceeds 40kW/m<sup>2</sup>.*”

## 10 Siting

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The current site provides adequate separation between the proposed building and surrounding vegetation for a compliant structure to be built.

**Recommendation;**

Nil

## 11 Construction and design.

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All new work is to be undertaken in accordance with the relevant requirements of the BCA and AS3959 2009. The following recommendations are a minimum level of construction. Constructing the proposal to a higher level than that recommended is allowable under AS3959.

### Recommendation; all new work.

1. New construction shall comply with the requirements of section 3 of Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas" and,
2. New construction shall also comply with the requirements of BAL-29 Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas" and section A3.7 Addendum Appendix 3 of "Planning for Bush fire Protection".
3. Any new fencing to be property should be in accordance with Rural Fire Service "Fast Fact 2/06".

## 12 Utilities

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### 12.1 Water

The proposed development will have access to a reticulated water supply. There is at least one hydrant indicated within the required distance from the dwelling.

### Recommendation;

Nil

### 12.2 Electricity and Gas

### Recommendation;

4. Any new electricity or gas connections are to comply with the requirements of section 4.1.3 of Planning for Bushfire Protection.

## 13 Asset Protection Zone (APZ)

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The Asset Protection Zone is *"An area surrounding a development managed to reduce the bushfire hazard to an acceptable level. The width of an APZ will vary with slope, vegetation and construction level"*.

### Recommendation;

5. At the commencement of building works and in perpetuity the entire property shall be managed as an Asset Protection Zone in accordance with the requirements of Planning for Bushfire Protection, the RFS document Standards for Asset Protection Zones and in a manner that does not create a bushfire hazard to the property.

## 14 Landscaping

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No specific landscaping plan has been provided as part of this assessment.

### Recommendation;

6. Any new landscaping to the site is to comply with the principles of Appendix 5 of Planning for Bush Fire Protection 2006. In this regard the following landscaping principles are, where applicable, to be incorporated into the development:
  - Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
  - Grassed areas/mowed lawns/ or ground cover plantings being provided in close proximity to the building;
  - Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come in contact with the building;
  - Maximum tree cover should be less than 30%, and maximum shrub cover less than 20%;
  - Planting should not provide a continuous canopy to the building (i.e. trees or shrubs should be isolated or located in small clusters);
  - When considering landscape species consideration needs to be given to estimated size of the plant at maturity;
  - Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;
  - Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
  - Avoid planting of deciduous species that may increase fuel at surface/ ground level (i.e. leaf litter);
  - Avoid climbing species to walls and pergolas;
  - Locate combustible materials such as woodchips/mulch, flammable fuel stores away from the building;
  - Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and
  - Use of low flammability vegetation species.

## 15 Constraints on the subject block

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None known.

### Recommendation;

Nil

## 16 Access/Egress

All roads in the area are considered to be capable of handling emergency service vehicles. Access from the roadway onto the property is also considered to be adequate for firefighting purposes.

### Recommendation

Nil

## 17 Compliance or non compliance with the specifications and requirements for bushfire protection measures

<b>APZ</b> A defensible space is provided onsite. An APZ is provided and maintained for the life of the development.	Achievable with the implementation of the recommendations in section 13
<b>SITING AND DESIGN:</b> Buildings are sited and designed to minimise the risk of bush fire attack.	Achievable with the implementation of the recommendations in section 10
<b>CONSTRUCTION STANDARDS:</b> It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Achievable with the implementation of the recommendations in section 11
<b>ACCESS</b> Safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire, (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7).	Achievable with the implementation of the recommendations in section 17
<b>WATER AND UTILITY SERVICES:</b> <ul style="list-style-type: none"> <li>adequate water and electricity services are provided for firefighting operations</li> <li>Gas and electricity services are located so as not to contribute to the risk of fire to a building.</li> </ul>	Achievable with the implementation of the recommendations in section 12
<b>LANDSCAPING:</b> <ul style="list-style-type: none"> <li>it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause Ignitions.</li> </ul>	Achievable with the implementation of the recommendations in section 14

## 18 Conclusions

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Based on the above report and with the implementation of the recommendation contained within this report the consent authority should determine that this development can comply with the requirements of AS 3959-2009 and 'Planning for Bushfire Protection' guidelines.

The recommendations contained within this report are to be implemented in their entirety. Changing one aspect may have an adverse effect on the rest of the recommendations.

Bushfires are affected by many external influences such as climactic conditions, vegetation type, moisture content of the fuel, slope of the land and human intervention to name a few and are difficult to predict.

This report does not intend to provide a guarantee that the subject property will survive if a bushfire should impact the surrounding area. The purpose of this report is to show the developments level of compliance or in some cases non-compliance with the New South Wales legislation regarding building in bushfire prone areas.

Where non-compliance is found measures will be suggested that should make the building less susceptible to the various attack mechanisms of a bushfire and comply with the performance requirements of the Building Code of Australia.

The opinions expressed in this report are based on the writers' experience and interpretation of the relevant guidelines and standards. Notwithstanding the above, these guidelines and standards are open to interpretation. All care has been taken to ensure that the opinions expressed in this report are consistent with past successful outcomes.

Some of the information used in the compilation of this assessment has been provided by the proponent or the proponent's representatives. While we believe this information to be true and have accepted the information in good faith however this company or its representatives will not accept any responsibility if the provided information is determined to be incorrect.

This document is to assist the consenting authorities with their assessment of this proposal. The recommendations contained in this assessment reflect the normal conditions that are typically applied by the consent authority for a proposal such as this however the conditions of consent for the proposal will be supplied by the certifying authority on approval of the development and may not necessarily be the same as the recommendations of this assessment.

The recommendations in this assessment are for planning guidance only, construction details and compliance with all building requirements are the responsibility of the Architect/Designer, Builder and Certifier.

To avoid confusion, unless specifically referenced by the consenting authority, it is strongly recommended that once this proposal has been approved that this document is no longer referenced and that only the official conditions of consent as reflected in documentation by the certifying body are used for construction guidance.



If any further clarification is required for this report, please do not hesitate to contact me using the details above.

Yours Sincerely



**Matthew Willis**

*Grad Dip Planning for Bushfire Prone Areas*

*Bushfire Planning Services Pty Limited*

## **19 References**

---

***Australian Building Codes Board***

*National Construction Code*

*Volumes 1&2*

*Canprint*

***NSW Government Environmental Planning and Assessment Act [1979]***

*Part 79BA – Consultation and development Consent – Certain Bushfire Prone Land*

*NSW Government Printer*

***Planning NSW [2006]***

*Planning for Bushfire Protection*

*A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*

***Ramsay C & Rudolph L [2003]***

*Landscape and Building Design for Bushfire Prone Areas*

*CSIRO Publishing*

***Standards Australia [2009]***

*Australian Standards 3959 (amendments 1, 2 and 3)*

*Standards Australia*

## 20 Appendix 1 - Plans

