

Planning For Bushfire Protection Pty Ltd




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Reference: 971
19/05/2015

Bushfire Risk Assessment

In relation to proposed development at:

No 1B The Serpentine, Bilgola Beach

<i>This Assessment has been prepared and Certified by: Ronald Coffey BPAD – A Certified Practitioner FPAA Cert. No: BPD-PA 09328</i>	
What is the recommended level of compliance AS3959, 2009?	AS3959, 2009 BAL FZ
Can this proposal comply with AS3959, 2009 + addendum to Appendix 3 of PBP?	<u>NO</u> - BAL FZ is beyond the scope of AS3959, 2009
Does this development comply with the requirements of PBP?	<u>YES</u> By Alternate Solution
Does this development comply with the Aims and objectives of PBP?	<u>YES</u>
Is referral to the NSW RFS required?	<u>YES</u>

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Introduction

The purpose of this report is to determine the category of bushfire attack and subsequent construction standard for the proposed development of alterations and additions at No 1B The Serpentine, Bilgola Beach.

The site is identified as 'bush fire prone land' for the purposes of Section 146 of the *Environmental Planning and Assessment Act 1979* and the legislative requirements for building on bushfire prone lands are applicable.

The proposed development is an infill development as defined within Chapter 4.3.5 of Planning for Bushfire Protection 2006 and this report has been prepared in accordance with the requirements of section 79BA of the Environment Planning and Assessment Act. This assessment includes an analysis of the hazard, threat and subsequent risk to the development proposal and provides recommendations that satisfy the Objectives and Performance requirements of the Building Code of Australia, Planning for Bushfire Protection 2006 [PBP] and Australian Standard AS3959, 2009.

The site was inspected: 19/05/2015

Summary of Assessment

- Building construction and design – AS3959, 2009 BAL FZ
- Asset Protection zones - Do not conform to the requirements of PBP; however, construction standards have been increased to the highest level for the flame zone category of bushfire attack
- Landscaping - Conforms to the requirements of PBP
- Access and egress arrangements – Conforms to the requirements of PBP
- Water supply and utilities - Conforms to the requirements of PBP
- Defendable space - Conforms to the requirements of PBP

1) Location

No 1B The Serpentine, Bilgola Beach
Lot 1, DP 232164
LGA – Pittwater



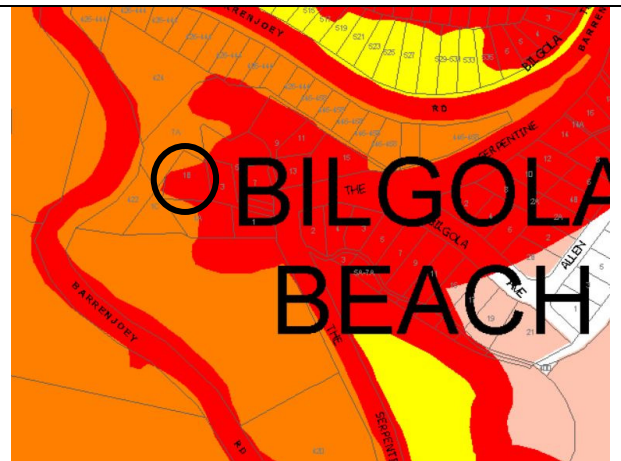
2) Development Proposal and Building Classifications

The proposal is for alterations and additions to an existing class 1A dwelling.

3) Description of the Subject

Property

The development site is a residential lot.
The following sections 4-8 describe in detail the vegetation, slope, access and egress, availability of water supplies and environmental considerations for the site.
The adjacent image is the bushfire prone land map for the area.



Legend

- Bush Fire Prone Land: Vegetation Category 1
- Bush Fire Prone Land: Vegetation Category 2
- Bush Fire Prone Land: Buffer - 100m & 30m

BUSH FIRE PRONE LAND MAP - LEGEND

- Bush Fire Prone Land ~ Vegetation Category 1
- Bush Fire Prone Land ~ Vegetation Category 2
- Bush Fire Prone Land ~ Vegetation Buffer - 100m & 30m
- LGA Boundaries

4) Classification of the Vegetation on and surrounding the Site

The site is developed and maintained and there is no threat from bushfire attack on the site.



Properties east of the subject site are developed and maintained and there is no threat of bushfire attack from these directions for more than 100m.

Adjoining the north, south and west boundaries of the subject site, is an area of bushland considered a threat from bushfire attack to the site. With reference to PBP and the bushfire prone land map for the area the classification of vegetation for this hazard is Shrubland.

5) Assessment of Effective Slope

Effective slope away from the development site:

North: 0-5 degrees upslope

South: 0-5 degrees downslope

East: No hazard for >100m

West: 10-15 degrees upslope

6) Access and Egress

The site has direct access to The Serpentine, which is a public road, and access and egress for emergency vehicles and evacuation is in opposite directions and appears adequate.

7) Adequacy of water supply

The area has reticulated water supply and hydrants are spaced at regular distances along The Serpentine; however, the nearest street hydrant is greater than 90m from the most distant point of the dwelling. This report will include recommendations that an additional water supply for protection from bushfire attack shall be provided and permanently available.

8) Environmental Considerations

The scope of this assessment has not been to provide an environmental assessment; however, the subject site is a small residential lot that has been developed for many years and it appears that the proposed development will have no adverse environmental effect.

9) Bushfire Risk Assessment

Table 1; Reference AS3959, 2009 Table 2.4.2

Determination of category of bushfire attack for the site and subsequent required building standards

Direction	Distance of APZ	Vegetation Classification	Assessment of Effective Slope	Anticipated Radiant heat	Bushfire Attack Level (BAL)
North	32m	Shrub	<5 degrees upslope	<12.5kw/m ²	BAL 12.5
South	12m	Shrub	<5 degrees downslope	<29kw/m ²	BAL 29
East	>140m	Developed sites	n/a	-	-
West	4m	Shrub	10-15 degrees upslope	>40kw/m ²	BAL FZ

Summary: Based upon the relevant provisions of PBP the category of bushfire attack is for the site is 'Flame zone' which is considered beyond the scope of AS 3959-2009. To determine construction standards to allow development to proceed, alternate solutions must be introduced which satisfy the performance requirements Part 2.3.4 of the BCA Volume 2.

The principle of shielding allows for the next lower BAL level than that determined for the site to be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack. In this instance the north, south and west elevations must be BAL FZ and the east elevation can be reduced by one level to BAL 40.

[There can only be a reduction of one BAL level and this can only apply to the elevation directly opposite the exposed side]

10) Assessment of the extent to which the construction conforms or deviates from Chapter 4 of 'Planning for Bushfire Protection 2006'

The proposed development conforms to the requirements of PBP for bushfire protection measures for infill development in relation to:

Performance Criteria	Acceptable Solutions	Meets Performance Criteria
The intent may be achieved where:		
<u>In relation to APZ's:</u> - Defendable space is provided - An APZ is provided and maintained for the life of the building	Defendable space is provided on all sides of the building Asset protection zones are provided partially on site and by adjoining development and public roads. APZ's cannot be provided on all sides of the dwelling in accordance with the minimum requirements of PBP; however, construction standards for development in the flame zone category of bushfire attack have been recommended.	Yes
<u>In relation to siting and design:</u> Buildings are sited and designed to minimise the risk of bushfire attack	The siting of the building has been previously determined in accordance with local council requirements and the proposed additions and alterations will not involve a re-siting of the building [no advantage could be gained by recommending a re-siting of the building].	Yes
<u>In relation to construction standards:</u> It is demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Construction standards have been recommended in accordance with the requirements of PBP. Variations to the construction standard for those elevations of the building that do not directly face the hazard will be recommended in this assessment.	Yes
<u>In relation to access requirements:</u> Safe operational access is provided [and maintained] for emergency services personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire.	The site has direct access to public roads, and access and egress for emergency vehicles and evacuation appears adequate.	Yes
<u>In relation to water and utility services:</u> - Adequate water and electricity services are provided for fire-fighting operations - gas and electricity services are located so as to not contribute to the risk to a building.	The nearest street hydrant is greater than 90m from the most distant point of the proposed development. This report will include recommendations that an additional water supply reserve for protection from bushfire attack is available. This report shall recommend compliance with PBP 4.1.3 for services including electricity and gas.	Yes

<p><u>In relation to landscaping:</u> It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions</p>	<p>The development application shall include recommendations that the site is managed in accordance with Inner Protection Area requirements of PBP.</p>	<p>Yes</p>
<p><u>In relation to Emergency and Evacuation Planning:</u></p>	<p>The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a <i>Bush Fire Survival Plan</i> as formulated by the NSW Rural Fire Service and the NSW Fire Brigades. An emergency evacuation plan is not recommended as a condition of consent.</p>	<p>Yes</p>

11) Recommendations

The following recommendations are made for the bushfire protection measures for the proposed residential development of alterations and additions at No 1B The Serpentine, Bilgola Beach and are based upon the relevant provisions of the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006*.

<p>1) <u>New Construction</u> East elevation</p>	<p>New construction shall comply with a minimum standard of section 3 [construction general] and section 8 (BAL 40), AS3959, 2009 + Section A3.7 of the NSW Rural Fire Service Addendum to Appendix 3 of Planning for Bushfire Protection 2006.</p>
<p>2) <u>New Construction</u> North, south and west elevations</p>	<p>New construction shall comply with section 3 [construction general] and section 9 (BAL FZ) Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas". However, any material, element of construction or system when tested to the method described in Australian Standard AS1530.8.2 "Methods for fire tests on building materials, components and structures Part 8.2: Tests on elements of construction for buildings exposed to simulated bushfire attack—Large flaming sources" shall comply with Clause 13.8 of that Standard except that flaming of the specimen is not permitted.</p>
<p>3) <u>External Exposed Timber</u></p>	<p>There shall be no external exposed timber used on the development.</p>
<p>4) <u>New Windows</u> North, south and west elevations</p>	<p>Windows: Window assemblies shall comply with modified Section 9 AS3959, 2009 [as above] or the following:</p> <ol style="list-style-type: none"> I. The entire of the new glazing and window system of the proposed new development shall be completely protected by a non-combustible and non-perforated bushfire shutter that complies with Section 3.7 of AS3959 excluding parts [e] & [f]; and II. They shall comply with the following: <ol style="list-style-type: none"> a) The window frames and hardware shall be metal; b) Glazing shall be toughened glass, minimum thickness 6mm; c) Seals to stiles head and sills or thresholds shall be manufactured

	<p>from material having a flammability index no greater than 5;</p> <p>d) The openable portion of the window shall be screened internally or external with a mesh with a maximum aperture of 2mm, made from corrosion resistant steel or bronze. The frame supporting the mesh shall be metal.</p> <p><i>Note: BAL 40 window systems with no external timber and a shutter as recommended in this section satisfy the requirements of this section.</i></p>
<p>5) <u>New Doors</u> North, south and west elevations</p>	<p>External Doors: New doors shall comply with modified Section 9 AS3959, 2009 [as above] or the following:</p> <p>I. External doors [not including garage doors] on the proposed new development shall be completely protected by a non-combustible and non-perforated bushfire shutter that complies with Section 3.7 of AS3959 excluding parts [e] & [f]; and</p> <p>II. They shall comply with the following:</p> <p>a) Doors shall be non-combustible;</p> <p>b) Externally fitted hardware that supports the panel in its function of opening and closing shall be metal;</p> <p>c) Where doors incorporate glazing, the glazing shall be toughened glass minimum thickness 6mm;</p> <p>d) Seals to stiles, head and sills or thresholds shall be manufactured from silicone;</p> <p>e) Doorframes shall be metal;</p> <p>f) Doors shall be tight fitting to the doorframe or an abutting door;</p> <p>g) Weather strips, draught excluders or draught seals shall be installed if applicable.</p> <p><i>Note: BAL 40 window systems with no external timber and a shutter as recommended in this section satisfy the requirements of this section.</i></p>
<p>6) <u>Bushfire shutters</u></p>	<p>Bushfire Shutters: Note; a bushfire shutter installed as above shall:</p> <p>a) be fixed to the building and be non-removable;</p> <p>b) when in the closed position, have no gap greater than 3mm between the shutter and the wall, sill or the head;</p> <p>c) be readily manually operable from either inside or outside;</p> <p>d) protect the entire window assembly;</p> <p>e) be non-combustible and non-perforated.</p>
<p>7) <u>Electricity and gas supplies</u></p>	<p>As far as practical, new electricity and gas supplies shall be installed in accordance with the requirements of 4.1.3 of PBP.</p> <p><i>Note: 4.1.3 of PBP requires that ‘where practical, electrical transmission lines should be underground’ and ‘the location of gas services will not lead to ignition of surrounding bushland or the fabric of the building’.</i></p>
<p>8) <u>Asset Protection Zones</u></p>	<p>At the commencement of building works and in perpetuity, the entire property shall be managed as an inner protection area as outlined within PBP 2006 and the NSW RFS document ‘Standards for asset protection zones’.</p> <p>The following points are a guide to Inner Protection area requirements. The Inner Protection Area should comprise of the following:</p> <ul style="list-style-type: none"> • Minimal fine fuel on the ground; • Vegetation that does not provide a continuous path to the

	<p>building for the transfer of fire;</p> <ul style="list-style-type: none">• Shrubs and trees that do not form a continuous canopy and vegetation is planted in clumps rather than continuous rows;• Species that retain dead material or deposit excessive quantities of ground fuel are avoided;• Shrubs and trees are pruned so that they do not touch or overhang the building; and• Vegetation is located far enough away from the building so that plants will not ignite the building by direct flame contact or radiant heat emission.
9) <u>Water Supplies</u>	To supplement the available reticulated water supply a minimum 5,000 water supply tank shall be provided. In accordance with RFS advice the water tank is not required to be solely dedicated for fire fighting purposes. A Storz fittings and ball or gate valve shall be installed in the tank.
10) <u>Emergency Risk Management</u>	The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a <i>Bush Fire Survival Plan</i> as formulated by the NSW Rural Fire Service. An emergency evacuation plan is not recommended as a condition of consent.

12) Summary

This report consists of a bushfire risk assessment for the proposed residential development of alterations and additions at No 1B The Serpentine, Bilgola Beach.

The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.

The proposed development will be constructed to the minimum standards required in accordance with the guidelines of *Planning for Bushfire Protection 2006*.

This report has considered all of the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations included in section 11 of this report, it is my considered opinion that the development satisfies the Objectives and Performance requirements of the *Building Code of Australia, Planning for Bushfire Protection 2006 and Australian Standard AS3959, 2009*.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such

buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

This Report is a Bush Fire Hazard Assessment that provides the required information to assist Local Council and the Rural Fire Service in determining compliance in accordance with Planning for Bushfire Protection and AS 3959, 2009. The Local Council is the Final Consenting Authority and the construction of the building must comply with the recommendations included in the Council's conditions of consent.



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13) References

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Fire Safety Engineering Guidelines
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ABCB Canberra

D. Drysdale D. [1998]

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John Wiley & Sons Ltd

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 2006

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

This document provides the necessary planning considerations when developing areas for residential use in residential, rural residential, rural and urban areas when development sites are in close proximity to areas likely to be affected by bushfire events and replaces Planning for Bushfire Protection 2001.

[This document is essential reading: Download a copy from the RFS website or purchase a copy through the NSW Government Online Shop or phone 9228 6333](#)

Ramsay C & Rudolph L [2003]

Landscape and Building Design for Bushfire Prone Areas
CSIRO Publishing

Standards Australia [2009]

Australian Standards 3959
Australian Building Code Board