Planning For Bushfire Protection

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BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Bushfire Risk Assessment

In relation to

Proposed Development at

No 45 Oxford Falls Road, Beacon Hill

This Assessment has been prepared and Certified by: Ronald Coffey
BPAD – A, Level 3, Certified Practitioner
FPAA Cert. No: BPD-PA 09328

This assessment confirms that the proposal conforms to the specifications and requirements, that are relevant to the development, of the version (as prescribed by the regulations) of the document entitled Planning for Bushfire Protection prepared by the NSW Fire Service in co-operation with the NSW Department of Planning.

Contents:

Introduction

The purpose of this report is to provide a bushfire risk assessment for the proposed development of a one into two lot subdivision at No 45 Oxford Falls Road, Beacon Hill. In accordance with section 146 of the Environmental Assessment Legislation Amendment Act 2007 [EP&A Act] the subject site has been identified as bush fire prone land and the legislative requirements for building and development on bushfire prone lands are applicable.

This assessment will address each of the heads of consideration listed under Clause 44 of the Rural Fires Regulation 2008 to provide them with the necessary information to allow for the issue of a Bushfire Safety Authority pursuant to the provisions of Section 100B of the *Rural Fires Act 1997*.

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 and Australian Standard AS3959, 2009.

This report will demonstrate that the proposed development can comply with the Specific Objectives for Subdivision in accordance with the requirements of PBP and therefore qualifies for a Bushfire Safety Authority.

Additionally, this report will include a recommended construction level and consider bushfire mitigation measures in combination for the existing dwelling on proposed lot 1 and the proposed new dwelling on proposed lot 2.

1) Description of the Subject Property

a) Description

The development site is an existing residential lot facing north onto Oxford Falls Road and is accessed by way of an access driveway off Dareen Street, Beacon Hill.

The total site area is 1,126m^2.

	**Figure 1** The adjacent image is of the subject site viewed from Oxford Falls Road. The image gives the impression the site is overgrown with vegetation; however, a site inspection confirmed only the verge and escarpment require some maintenance.
	**Figure 2** The adjacent image is the access driveway to the subject site off Dareen Street.

b) Location

No 45 Oxford Falls Road, Beacon Hill

Lot 1, DP 206 629

LGA – Northern Beaches Council

b) Zoning of Proposed Development Site and Adjoining Properties

The site is zoned R2 – Low Density Residential

Properties adjoining south, east and west boundaries of the subject site are similarly zoned R2 – Low Density Residential. Across Oxford Falls Road to the north properties are zoned DM [Zone Description – Deferred Matter]

c) Development Proposal and Building Classifications

The proposal is for a one into two lot subdivision of No 45 Oxford Falls Road. Beacon Hill. The proposal includes some alterations and additions to the existing class 1a dwelling on proposed lot 1 and a new class 1a dwelling and class 10a carport on proposed lot 2.

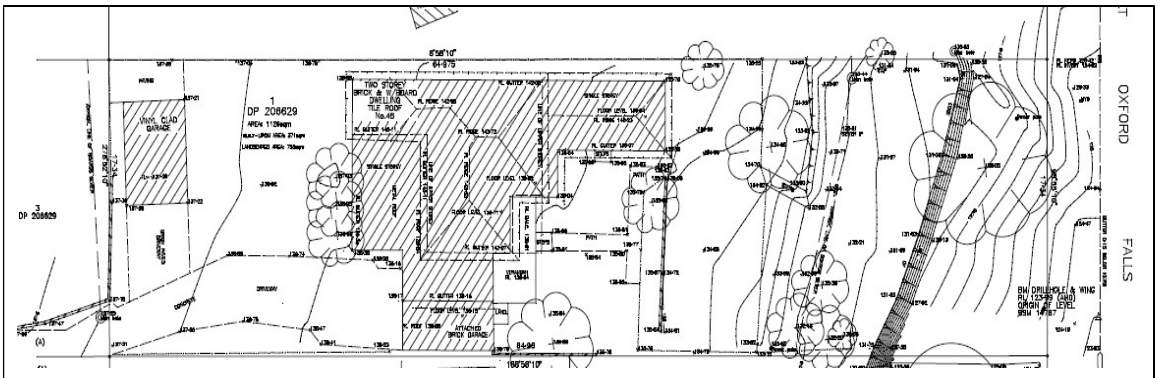

Figure 3 The above image is a recent survey plan. The proposal includes the removal of a section of the existing Class 1a dwelling to provide site coverage and boundary setbacks in accordance with council requirements.

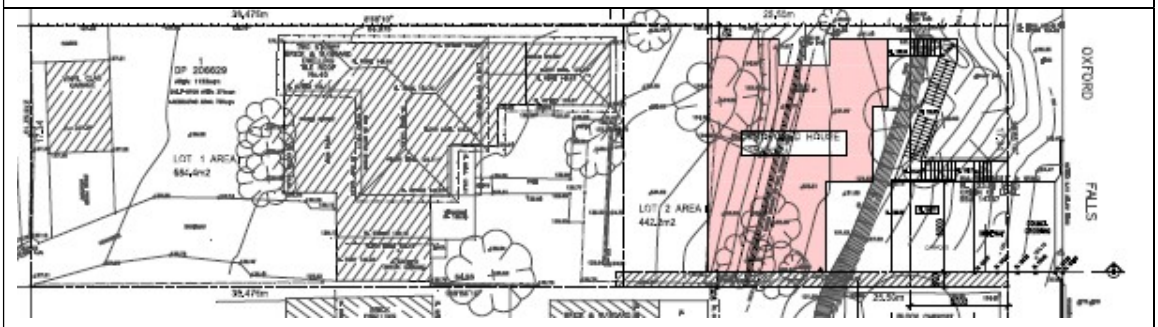

Figure 4 The above image is the proposed plan of the two newly created lots.
The siting and dimensions of the proposed new dwelling [highlighted], the new access driveway and carport are detailed on this plan.

2) Classification of the Vegetation on and surrounding the Site

The site is developed and maintained.

Figure 5
Aerial and BFPLM

South, East and West: Properties south east and west of the subject site for more than 100m are developed and maintained.

North: 90m north of the subject site, along the either side of Oxford falls Road, is an area of vegetation considered a hazard. With reference to PBP and the bushfire prone land map for the area, the vegetation structure is forest.

3) Assessment of Slope on and surrounding the Site

The site slopes downslope from north to south and is generally level across the site from east to west.

Slope away from the development site:

- North: Effective slope - 0-5 degrees upslope
- South: upslope
- East: 0-5 degrees downslope
- West: upslope

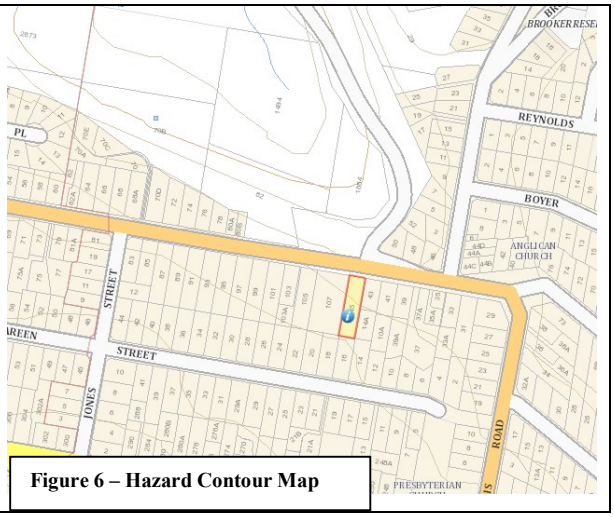

Figure 6 – Hazard Contour Map

4) Identification of Significant Environment Features

A statement of environmental effects has been provided and no significant environmental features have been identified.

5) Threatened Species Identification

The statement of environmental effects concludes there are no environmental instruments applying to the site.

6) Aboriginal Relic or Place detail and Location known to exist on the property

There has been no Aboriginal Relic or Place detail identified on the site.

7) Bushfire Risk Assessment

7a) the extent to which the development is to provide for setbacks, including Asset Protection Zones

This Bushfire Assessment includes Table 1, 2 and 3 which summarize the extent to which the development is to provide for setbacks, including asset protection zones and minimum construction standards.

Table 1: Reference to 'Planning for Bushfire Protection 2006' Table A2.4 Minimum Specifications for Asset Protection Zones for residential developments in bushfire prone areas.

Direction	Distance of asset protection zone from subject site	Vegetation classification	Effective slope away from the development	Required asset protection zone with reference to Table A2.4
North	90m	Forest	upslope	20m
South	>140m	Developed sites	upslope	n/a
East	>140m	Developed sites	downslope	n/a
West	>140m	Developed sites	upslope	n/a
Summary: Asset protection zones can be provided in excess of the requirements of Table A2.4 Planning for Bushfire Protection 2006				

Table 2: Construction Standard Lot 1: Reference Table 2.4.2 AS3959, 2009 Determination of Category of Bushfire Attack for the site and subsequent required building standards for proposed Lot 1.

Direction	Distance of APZ from proposed lot 1	Vegetation Classification	Assessment of Effective Slope	Anticipated Radiant heat	Bushfire Attack Level (BAL)
North	>100m	Developed sites	Upslope	Low	BAL Low
South	>140m	Developed sites	upslope	n/a	Low
East	>140m	Developed sites	0-5 degrees downslope	n/a	Low
West	>140m	Developed sites	upslope	n/a	Low
The entire site and existing building are not within the 100m buffer zone, the bushfire attack level is 'Low' and in accordance with section 2.2.3.2 and Table 3.1 of AS3959, 2009, there is insufficient risk to warrant specific construction requirements.					

Table 3: Construction Standard Lot 2: Reference Table 2.4.2 AS3959, 2009 Determination of Category of Bushfire Attack for the site and subsequent required building standards for proposed Lot 2.

Direction	Distance of APZ from proposed lot 2	Vegetation Classification	Assessment of Effective Slope	Anticipated Radiant heat	Bushfire Attack Level (BAL)
North	90m	Forest	Upslope	<12.5 kw/m2	BAL 12.5
South	>140m	Developed sites	upslope	n/a	Low
East	>140m	Developed sites	$0\text{-}5^0$ downslope	n/a	Low
West	>140m	Developed sites	upslope	n/a	Low
Summary: Based upon the relevant provisions of PBP the anticipated radiant heat attack for the site is <12.5 kw/m2 and the subsequent minimum construction standard is BAL 12.5 AS3959, 2009.					

7b) Siting and adequacy of water supplies for fire fighting

The area has a reticulated water supply; however, the closest hydrant is >70m from the most distant part of proposed lot 1. This assessment will include a recommendation that a minimum dedicated water supply required for firefighting purposes shall be provided for proposed lot 1 in accordance with Table 4.2 of PBP.

7c) the capacity of public roads in the vicinity to handle increased volume of traffic in an emergency

The public roads in the vicinity of the subject site are all two way, with no restrictions to impede the flow of traffic and appear to be adequate to handle increased traffic in an emergency.

7d) Whether or not public roads in the vicinity that link with the fire trail network have two-way access

The are no known fire trails in the immediate vicinity; however, this is not an issue as the proposed development has direct access to public roads.

7e) the adequacy of arrangements for access to and egress from the development site for the purpose of an emergency response

The proposed development has direct access to adjoining public roads and access and egress for emergency vehicles and evacuation appears adequate. The exiting driveway to lot1 from Dareen Street has provided effective access and egress for more than 50 years and proposed lot 2 will have a new access provided directly off Oxford Falls Road.

7f) the adequacy of bushfire maintenance plans and fire emergency procedures for the development site

Bushfire maintenance plans: The entire of the both newly created lots shall be landscaped and managed in accordance with asset protection zone requirements of PBP. A bushland management & maintenance plan have not been recommended.

Fire emergency procedures for the site consist of passive fire protection measures that provide a safe refuge, defendable space, asset protection zones and adequate access and egress paths for occupants and fire-fighting authorities. The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a *Bush Fire Survival Plan* 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.

7g) the construction standards to be used for building elements in the development

Construction standards have been determined [Ref. Table 2 and 3 of this report] in accordance with the requirements of PBP.

The proposed construction standard for the existing dwelling on lot 1 is BAL Low and BAL 12.5 for proposed Lot 2.

7h) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development

A sprinkler system is not required and not recommended.

Bushfire specific fire protection measures that have been addressed include:

- Asset protection zones that satisfy the requirements of chapter 4 of PBP and provide appropriate defendable space for fire-fighting authorities.
- Construction standards that do not deviate from the requirements of PBP.
- Access and egress paths designed, established and maintained that are adequate to provide safe and effective evacuation from the site.
- Preparation of a Bushfire Survival Plan in accordance with the NSW RFS Guidelines;
- Water and utility services that comply with the requirements of 4.1.3 of PBP.

8) Assessment of the extent to which the development proposal conforms or deviates from the specifications set out in Chapter 4 of Planning for Bushfire Protection 2006

Performance Criteria	Acceptable Solutions	Meets Performance Criteria
The intent may be achieved where:		
In relation to APZ's: - Defendable space is provided - An APZ is provided and maintained for the life of the building. - The separation provided by the APZ is such that radiant heat levels at any point on a proposed building will not exceed 29kw/m2	Defendable space is provided on all sides of existing and proposed buildings Asset protection zones are provided partially on site and by adjoining development and public roads. The separation between the hazard and proposed development is in excess of the requirements of Table 2.4 of PBP	Yes

In relation to siting and design: Buildings are sited and designed to minimise the risk of bushfire attack	The siting of the buildings shall be determined in accordance with local council requirements and no advantage could be gained by recommending a re-siting.	Yes
In relation to construction standards: 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	Yes
In relation to access requirements: 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 access and egress requirements have been designed to provide safe and effective evacuation from the subject site and appear to be adequate for fire brigade personnel and firefighting equipment.	Yes
In relation to water and utility services: - 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 area has reticulated water supply and the nearest street hydrant is within the minimum required distance from the most distant point of lot 2 in accordance with the requirements of PBP and AS2419.1 2005. Additional water supplies are recommended for Lot 1. This report shall recommend compliance with PBP 4.1.3 for services including electricity and gas.	Yes
In relation to landscaping: It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions	The development application shall include recommendations that the entire site is managed in accordance with Inner Protection Area requirements of PBP. This will ensure the landscaping on the entire site complies with the principles of Appendix 5 of PBP.	Yes
In relation to Emergency and Evacuation Planning: The intent of emergency and evacuation planning is to ensure occupants are aware of the need to prepare adequately for any bushfire emergency.	The need to formulate an emergency evacuation plan has been discussed; however, an emergency evacuation plan is not recommended as a condition of consent.	Yes

9) Recommendations

The following recommendations are made for the bushfire protection measures for the Proposed Residential Development of a one into two lot subdivision at No 45 Oxford Falls Road, Beacon Hill. The proposal includes some alterations and additions to the existing Class 1a dwelling on proposed lot 1 and a new Class 1a dwelling and Class 10a carport on proposed lot 2. The recommendations are based upon the relevant provisions of the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006.*

1) Bushfire Safety Authority: The proposed development complies with the Specific Objectives for subdivision in accordance with the requirements of PBP and therefore qualifies for a Bushfire Safety Authority.
2) Construction Standard Lot 1: The entire of the existing building and the proposed alterations and additions are not within the 100m buffer zone, the bushfire attack level is 'Low' and in accordance with section 2.2.3.2 and Table 3.1 of AS3959, 2009, there is insufficient risk to warrant specific construction requirements.
3) Construction Standard Lot 2: The proposed development shall be constructed to a minimum standard of Section 3 [construction general] and Section 5 [BAL 12.5] of AS3959, 2009 *'Construction of Buildings in Bushfire Prone Areas'* and Section A3.7 of the NSW Rural Fire Service Addendum to Appendix 3 of '*Planning for Bushfire Protection 2006'*.
4) Electricity and Gas Supplies: As far as practical, new electricity and gas supplies shall be installed in accordance with the requirements of 4.1.3 of PBP. 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'*.
5) Construction Standard Class 10a Buildings: The development proposal includes the construction of a new carport on lot 2. The proposed carport shall comply with the requirements of AS3959, 2009 Part 3.2. *Construction Requirements for Specific Structures*. In this instance the proposed carport is within 10m of the main building and shall be constructed to BAL 12.5 AS3959, 2009.

6) Construction Standard Class 10b: PBP 4.3.6 [f] At the planning stage, class 10b buildings in bushfire prone areas should be non-combustible. [Class 10b buildings include a retaining or free-standing wall, swimming pool or the like.]
7) Fences and Gates: All new fencing and gates shall be constructed in accordance with the NSW Rural Fire Service guideline: Fast Fact – *Fences or Gates in Bushfire Prone Areas*. [Refer Appendix 1 of this report]
8) Electricity and Gas Supplies: As far as practical, new electricity and gas supplies shall be installed in accordance with the requirements of 4.1.3 of PBP. 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'*.
9) Asset Protection Zones: At the commencement of building works and in perpetuity, the entire property shall be managed as an inner protection area as outlined within PBP and the NSW RFS document 'Standards for asset protection zones.'

   The following points are a guide to Inner Protection area requirements.

   The Inner Protection Area should comprise of the following:

   - Minimal fine fuel on the ground;
   - Vegetation that does not provide a continuous path to the building for the transfer of fire;
   - 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.
10) Emergency and Evacuation Planning: The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should

complete a *Bush Fire Survival Plan* as formulated by the NSW Rural Fire Service.

An emergency evacuation plan is not recommended as a condition of consent.

11) Water Supplies Lot 2: Reticulated water supply is located on the adjoining road at regular intervals and is easily accessible. No additional water supplies have been recommended.

12) Water Supplies Lot 1: In recognition that reticulated water supply exists, but the closest hydrant is >70m from the most distant part of the existing dwelling, a 5,000 litre water supply tank and a minimum of 3kW (5hp) petrol or diesel-powered pump shall be provided. A 65mm Storz fitting and ball or gate valve shall be installed in the tank. The water supply tank, if located externally, shall be constructed of non-combustible material [metal or masonry]. There is no requirement for the tank to be a dedicated water supply.

10) Summary

This report consists of a bushfire risk assessment for the proposed development of a one into two lot subdivision at No 45 Oxford Falls Road, Beacon Hill. The proposal includes some alterations and additions to the existing Class 1a dwelling on proposed lot 1 and a new Class 1a dwelling and Class 10a carport on proposed lot 2.

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

This report has demonstrated that the proposed development can comply with the Specific Objectives for Subdivision in accordance with the requirements of PBP and therefore qualifies for a Bushfire Safety Authority.

This report has considered all the elements of bushfire attack and provided new buildings are constructed in accordance with the recommendations included in section 9 of this report, the development is considered to satisfy 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.

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Grad I Fire E [Institute of Fire Engineers - 1973]
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Grad Dip Building in Bushfire Prone Areas [UWS – 2005]
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14) References

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11th February 2002

Appendix 1 – A Guide to Fences and Gates in Bushfire Prone Areas

BAL 12.5 & BAL 19

1. Where a timber fence does not connect to a dwelling and has a minimum of 1 metre separation from the dwelling then a fence may be constructed from hardwood, or non-combustible material.
2. Where a fence connects directly to or has less than 1 metre separation from a dwelling it should be constructed from non-combustible materials only.
3. In all cases where timber fences are proposed, care should be taken in the selection, location and maintenance of landscaping adjoining the fence. Unmanaged landscaping could promote fire activity due to ember, radiant heat and direct flame contact and then further impact timber fencing.

The above is based on the premise that construction for level 1 & 2 dwellings is sufficiently removed from the main fire front and won't be subjected to direct flame contact or extreme levels of radiant heat that may cause ignition of combustible materials. However, dwellings could still be exposed to significant levels of ember attack and relatively high levels of radiated heat that may cause fences to ignite.

BAL 29, BAL 40 &/or Flame Zone

Dwellings assessed as requiring these construction levels shall have fencing constructed from non-combustible materials e.g. Sheet metal or masonry. This is due to the increased likelihood of direct flame contact causing ignition of combustible materials which may provide a fire path to the dwelling.