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8/13 Fairway Close, Manly Vale, NSW, 2093

## Bushfire Risk Assessment

In relation to a proposed development at:

60 Binalong Avenue, Allambie Heights, NSW

Report No: 60Bin-02 Date: 25/1/2018

Plans provided by: Walsh Architects

Dated: 7/1/2018

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## **Executive Summary**

The purpose of this report is to provide a bushfire risk assessment for the proposed boarding house development at No 60 Binalong Avenue, Allambie Heights, NSW.

In accordance with Section 146 of the environmental Assessment Legislation Act, 2007 [EP&A Act] the subject site has been identified as bushfire prone land and the legislative requirements for building and development on bushfire prone lands are applicable.

This report has been prepared in accordance with the format of Clause 44 of the Rural Fire Regulation 2008 for consideration of a Bushfire Safety Authority under 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 2006 and AS3959-2009 Construction of buildings in bushfire prone areas.

Following a site assessment, it was determined the asset protection zone of the development will exceed minimum requirements, and keep radiant heat levels below 29kW/m<sup>2</sup> and therefore, with the recommendations stated in this report, can achieve the requirements for the issue of a Bushfire Safety Authority.

The site was inspected on 17/12/2017.

## 1. Description of the subject property

Property address: Lots 2211 and 2223 DP752038, No 60 Binalong Ave, Allambie Heights, NSW.

Local government area: Northern Beaches

### a) Description

The development site is a residential site on the eastern side of Binalong Ave. This report describes in detail the vegetation, slope, access and egress, availability of water supply and environmental considerations for the site.



Figure 1: Map showing location of the subject site.

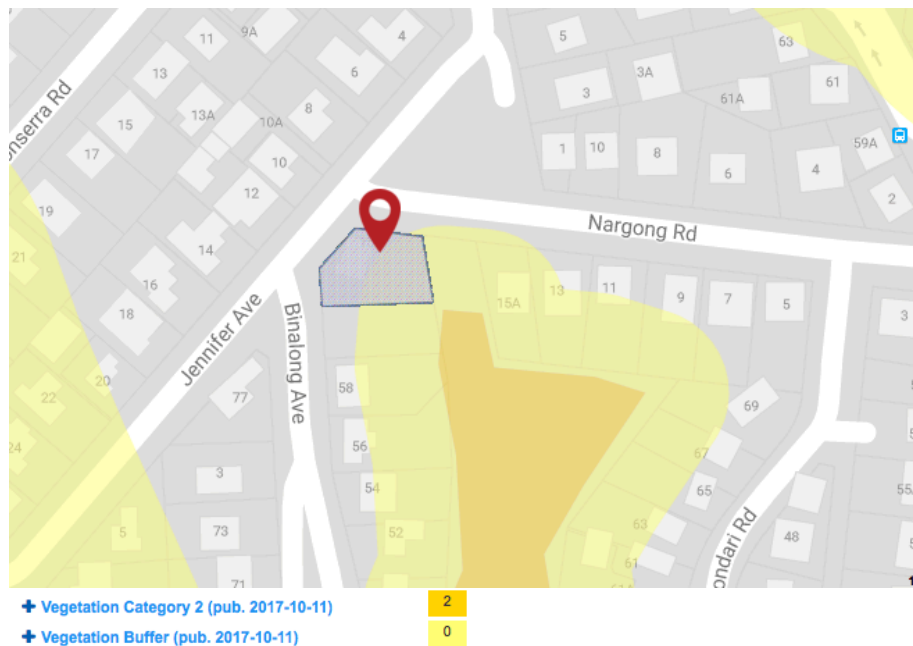


Figure 2: Bushfire prone land map showing the location of the subject site.

#### b) Zoning of the proposed development site and adjoining properties

This site is Zoned R2, Low density residential.

Properties adjoining the site are similarly Zoned R2.

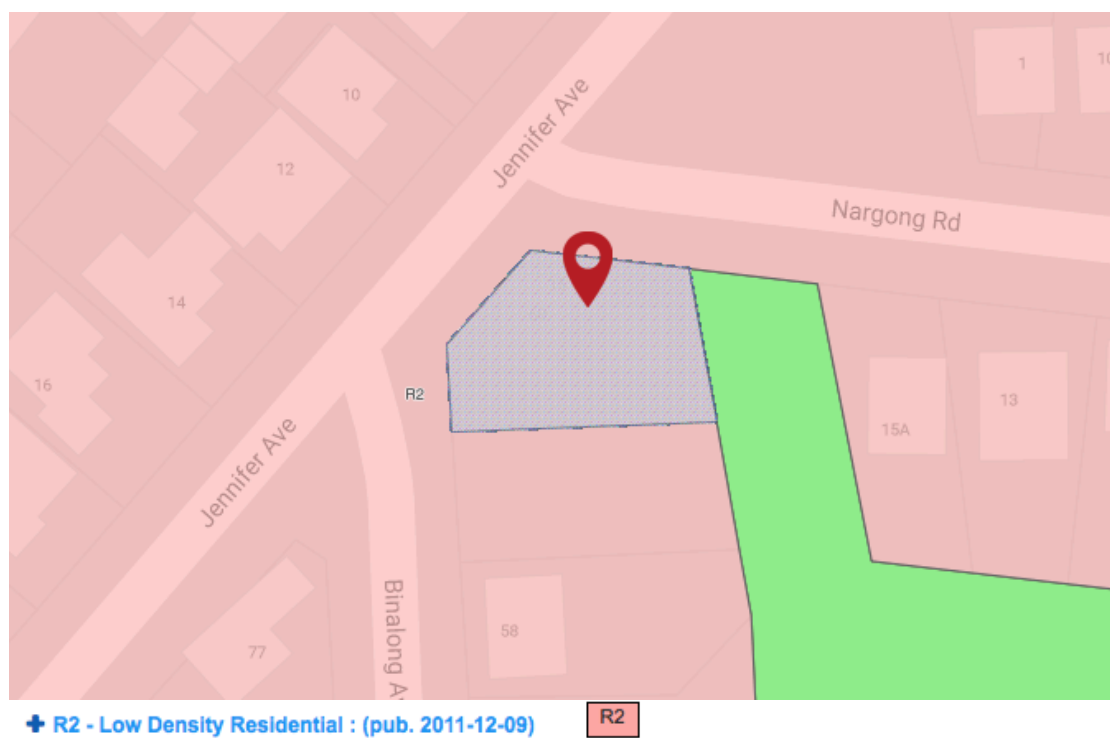


Figure 3: Land zoning map showing the subject site is Zoned R2, Low density residential.

### c) Development proposal and building classifications

The development proposal is for the construction of new boarding house as shown on figure 4.



Figure 4: Site plan showing proposed new boardinghouse.



## 2. Classification of the vegetation on and surrounding the site

The site is located within an existing residential subdivision. The site has been cleared and there is no threat from bushfire attack on the site. For the purpose of assessing the bushfire hazard to the subject site, there is an area of vegetation to the southeast which is of significance.



Figure 5: Aerial photo showing the location of the site and surrounding vegetation.

**North:** Properties to the north of the site are developed and maintained and there is no threat of bushfire attack from this direction for more than 140m.

**East:** Properties to the east of the site are developed and maintained and there is no threat of bushfire attack from this direction for more than 140m.

**South (southeast):** Adjoining the southeast boundary of the site boundary there is an area of vegetation that is considered a threat for bushfire attack to the site. This is a small area of vegetation that remains in between residential developments.

This vegetation has been identified as Category 2 vegetation on the Bushfire Prone Land Map which is of less risk from bushfire attack than Category 1 vegetation, and for the purpose of this assessment will be assessed as Remnant Forest vegetation (Rainforest).

There is a narrow strip of vegetation that continues up the eastern boundary. This is very narrow and is used as a drainage easement. Upon a site inspection, this strip appears to be of low threat to the site and will be assessed as such.

**West:** Properties to the west of the site are developed and maintained and there is no threat of bushfire attack from this direction for more than 140m.

### 3. Assessment of effective slope

Direction	Hazard Type	Effective slope
North	No hazard >140m	N/A
East	No hazard >140m	N/A
South (Southeast)	Remnant Forest	Downslope >10-15 degrees
West	No hazard >140m	N/A

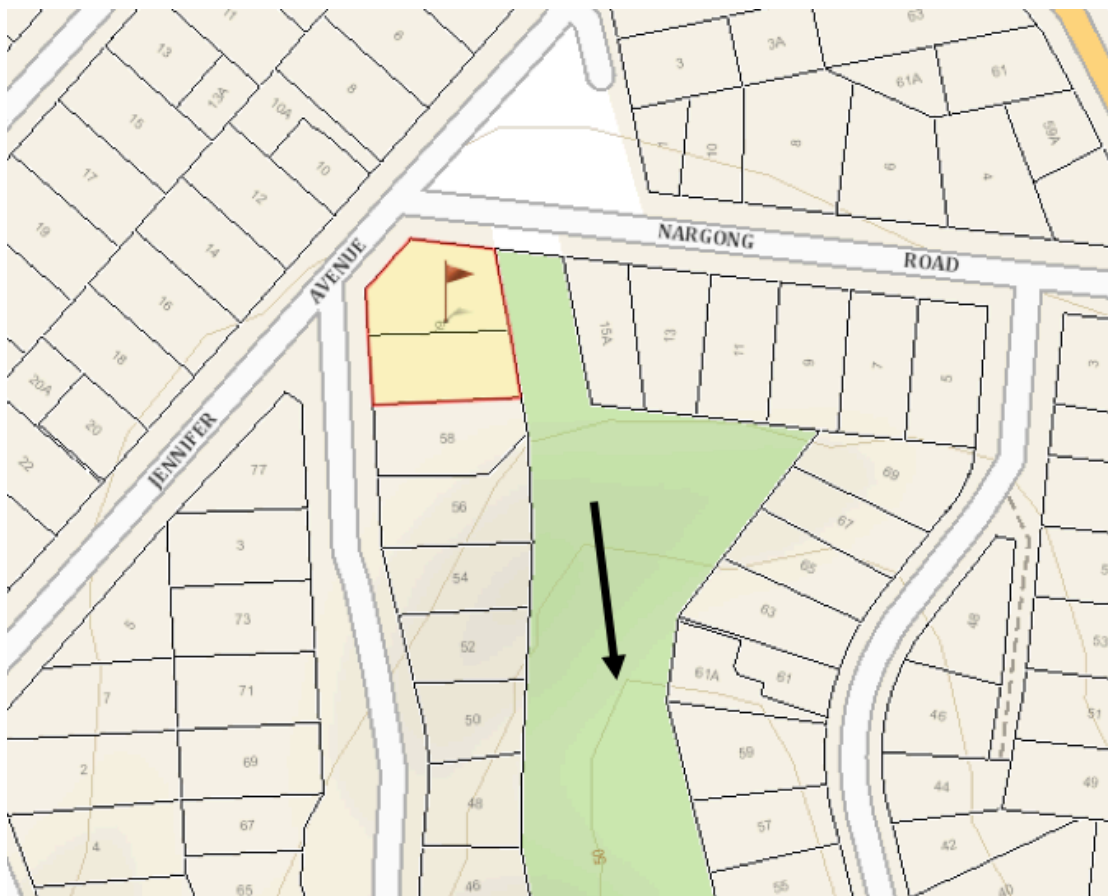


Figure 6: Topographic map showing direction of effective slope.



## 4. Bushfire risk assessment

### a) The extent to which the development is to provide for setbacks and APZ's

**Table 1:** Reference to *Planning for Bushfire Protection 2006* Table A2.4, minimum specifications for asset protection zones (m) for residential and rural residential subdivision.

Direction	FDI	Vegetation classification	Effective slope	Required APZ with reference to Table A2.4 in PBP	Actual distance to classified vegetation
North	100	No hazard >140m	N/A	N/A	N/A
East	100	No hazard >140m	N/A	N/A	N/A
South (Southeast)	100	Remnant Forest	Downslope >10-15 degrees	20m	23m
West	100	No hazard >140m	N/A	N/A	N/A

**Summary:** Asset protection zones can be provided for in excess of the requirements of Table A2.4 of PBP.



Figure 7: Aerial photo showing required APZ to achieve BAL-29.

**Table 2;** reference AS 3959, 2009 table 2.4.2

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

Direction	Distance to classified vegetation	Vegetation Classification	Assessment of effective slope	FDI	Bushfire Attack Level
North	>140m	N/A	N/A	N/A	BAL-19
East	>140m	N/A	N/A	N/A	BAL-29
South (Southeast)	23m	Remnant Forest	Downslope >10-15 degrees	100	BAL-29
West	>140m	N/A	N/A	N/A	BAL-19

Summary: Based upon the relevant provisions of PBP the anticipated radiant heat attack for the site is <29kW/m<sup>2</sup> and the subsequent minimum construction standard is BAL-29 AS 3959- 2009.

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 east and south elevation must be BAL-29, and the north and west elevations can be reduced by one level to BAL-19.

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

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

The area and site has reticulated water supply. Hydrants are spaced at a regular distance along Binalong Avenue.

**c) The capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bushfire 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.

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

There are no fire trails in the vicinity. The subject site has direct access to public roads.

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

Binalong Avenue is a public two-way Road. Access and egress for emergency vehicles appears to be adequate

**f) The adequacy of bush fire maintenance plans and fire emergency procedures for the development site**

Bushfire maintenance plan: Minimum APZ requirements shall be managed in accordance with asset protection zone requirements of PBP. A bushland management and maintenance plan has not been recommended.

Fire emergency procedures: Fire emergency procedures for the site consist of passive fire protection measures that provide a safe refuge, defensible space, asset protection zones and adequate access and egress paths for occupants and fire fighting authorities. It is advised the residents should complete a *Bushfire Survival Plan* as formulated by the NSW Rural Fire Service and Fire and Rescue NSW. An emergency evacuation is not recommended as a condition of consent.

**g) Construction standard to be used for building elements in the development**

The development proposal is for the construction of a new boarding house development. Proposed APZ's will keep radiant heat at the building below 29kW/m<sup>2</sup> and subsequent minimum construction standard is BAL-29 AS 3959- 2009.

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 east and south elevations must be constructed to BAL-29 requirements and the north and west elevations can be reduced by one level to BAL-19.

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

The use of sprinkler systems is not required for this development

The fire protection measures that have been included include;

- Asset protection zones that satisfy the requirements of Chapter 4 of PBP and provide appropriate defendable space for fire fighting.
- 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.
- Water and utility services that comply with the requirements of 4.1.3 of PBP.
- Recommendations that the landscaping complies with the principles of Appendix 5 of PBP.

## 5. Assessment of proposed new landscaping

Based on the plans provided, the proposed new landscaping on the site conforms to the requirements of Chapter 5 of PBP and is in accordance with guidelines of an Asset Protection Zone.

Plans provided by: Banksia Design Group (Job No: C01 180109, Dated: 24/1/18).



Figure 8: Landscape plan.

## 6. 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	How this development meets acceptable solutions
<p><u>Asset Protection zones</u></p> <ul style="list-style-type: none"> <li>-Radiant heat levels at any point of the proposed building will not exceed 29 kW/m<sup>2</sup>.</li> <li>-APZ's are managed and maintained to prevent the spread of fire towards the building.</li> <li>-APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.</li> </ul>	<ul style="list-style-type: none"> <li>-The separation between the hazard and the proposed development is in excess of the requirements of Table A2.4 of PBP.</li> <li>-Defendable space can be provided for around the new dwelling.</li> <li>-APZ's are located on land with slope less than 18 degrees.</li> </ul>
<p><u>Property Access</u></p> <ul style="list-style-type: none"> <li>-Access to properties is provided in recognition of the risk to fire fighters and/or evacuating occupants.</li> <li>-The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles.</li> <li>-All weather access is provided.</li> <li>-Road widths and design enable safe access for vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>-All roads to the property are sealed, two-way public roads and appear to be adequate for fire brigade equipment and residential evacuation.</li> <li>-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 fire fighting equipment.</li> </ul>
<p><u>Services- Water, electricity and gas</u></p> <ul style="list-style-type: none"> <li>-Water supplies are easily accessible and located at regular intervals.</li> <li>-Location of electrical services limits the possibility of ignition of surrounding bushland or the fabric of the building.</li> <li>-Location of gas services will not lead to ignition of surrounding bushland or the fabric of the building.</li> </ul>	<ul style="list-style-type: none"> <li>-The area has reticulated water supply. No additional water supply has been recommended.</li> <li>-This report shall recommend compliance with PBP 4.1.3 for services including electricity and gas.</li> </ul>
<p><u>Construction standards</u></p> <ul style="list-style-type: none"> <li>- It is demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.</li> </ul>	<ul style="list-style-type: none"> <li>-Construction standards have been recommended in accordance with the requirements of PBP and AS 3959-2009.</li> </ul>



<u>Siting &amp; design</u>  -Buildings are sited and designed to minimise the risk of bushfire attack.	-The siting and design of the lots has been determined in accordance with local council requirements. No advantage could be gained by recommending a re-siting of the building.
<u>Landscaping</u>  -Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignition.	- Based on the plans provided, the proposed new landscaping on the site conforms to the requirements of Chapter 5 of PBP and is in accordance with guidelines of an Asset Protection Zone.
<u>Emergency and evacuation planning</u>  -The intent of emergency and evacuation planning is to ensure occupants are aware of the need to prepare adequately for a bushfire emergency.	-The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a <i>Bushfire Survival Plan</i> as formulated by the NSW Rural Fire Service and Fire and Rescue NSW.  An emergency evacuation plan is not recommended as a condition of consent.

## 7. Recommendations

The following recommendations are made for the bushfire protection measures for the proposed boarding house development at No 60 Binalong Avenue, Allambie Heights, and are based upon the relevant provisions of the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006*.

This report has been formulated to support consideration of a Bushfire Safety Authority under Section 100B of the Rural Fires Act 1997.

### 1) **Construction Standard:**

**North and west elevations:** New construction shall comply with a minimum standard of section 3 [construction general] and section 6 (BAL-19), AS3959-2009 and Addendum to Appendix 3 of *Planning for Bushfire Protection 2006*.

**East and south elevations:** New construction shall comply with a minimum standard of section 3 [construction general] and section 7 (BAL-29), AS3959-2009 and Addendum to Appendix 3 of *Planning for Bushfire Protection 2006*.

**Note:** There is a small area where the underground carpark and outdoor area extends into the proposed APZ for the dwelling. It is recommended this underground parking and outdoor area be constructed of non-combustible materials.

**2) Construction Standard Class 10a Buildings:** Class 10a buildings shall comply with the requirements of AS3959, 2009 Part 3.2. *Construction Requirements for Specific Structures*.

**3) 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.]

**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 bush land or the fabric of the building'.

**5) Asset Protection Zones:** At the commencement of building works and in perpetuity, APZ's shall be managed in accordance with PBP and the NSW RFS document 'Standards for asset protection zones'.

**6) 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 and the NSW Fire Brigades. An emergency evacuation plan is not recommended as a condition of consent.

**7) Water Supplies:** The site is serviced by a reticulated water supply. No additional water supply is recommended.

## 8. Summary

This report consists of a bushfire risk assessment for the proposed boarding house development at No 60 Binalong Avenue, Allambie Heights, NSW.

This report has been formulated to support consideration of a Bushfire Safety Authority under Section 100B of the Rural Fires Act 1997.

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.

This report has considered all of the elements of bushfire attack and the compensation measures listed are only of value and capable of providing the required protection from bushfire attack if they are considered as a complete package.

Provided the proposed development is constructed in accordance with the recommendations included in section 6 of this report, the development proposal is considered to satisfy the Objectives and Performance requirements of the Building Code of Australia, Planning for Bushfire Protection and Australian Standard AS3959, 2009.

***NOTE:** 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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## 9. References

### **Australian Building Codes Board**

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### **Australian Building Codes Board [2001]**

Fire Safety Engineering Guidelines

Edition 2001

ABCB Canberra

### **D. Drysdale D. [1998]**

Introduction to Fire Dynamics 2<sup>nd</sup> Edition

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

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