

Bushfire Hazard Assessment Report

Proposed:
Alterations & Additions

At:
**828 Barrenjoey Road,
Palm Beach**

Reference Number: 160581

Prepared For:
Fadi Khoury

20th January 2016



Prepared By:
**Building Code & Bushfire
Hazard Solutions Pty Limited**

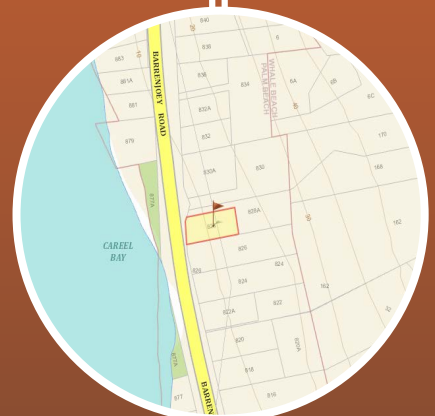
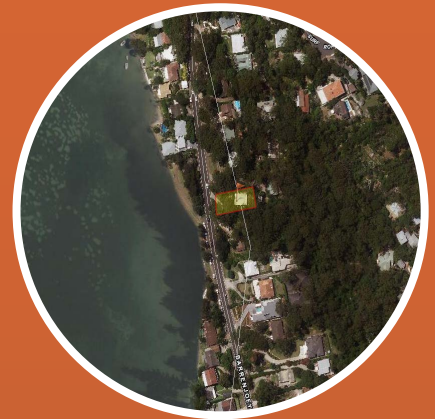
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Fire Protection
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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMS	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Pittwater Council
DA	Development Application
EP&A Act	<i>Environmental Planning and Assessment Act - 1979</i>
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection – 2006</i>
ROW	Right of Way
RF Act	<i>Rural Fires Act - 1997</i>
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to the alterations and additions to an existing dwelling and the construction of a granny flat within an existing residential allotment at 828 Barrenjoey Road, Palm Beach (Lot 41 DP 771130).

The subject property has street frontage to Barrenjoey Road to the west and abuts similar residential allotments to the remaining three aspects. The vegetation identified as being the hazard is to the east of the proposed development within neighbouring residential allotments.

Pittwater Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre Buffer zone to Category 1 Vegetation, therefore the application of *Planning for Bush Fire Protection* - 2006 (PBP) must apply in this instance.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide the owners and Council with an independent bushfire hazard determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

Where Council considers a bushfire risk is associated with surrounding private lands or lands owned by an authority, Council could seek to issue notice under Section 66 of the *Rural Fires Act* on any or all surrounding properties for the purposes of reducing and maintaining safe levels of vegetation and thus reducing the possibility of bushfire impact to the subject property and any adjoining properties.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act), the RFS document known as '*Planning for Bush Fire Protection* 2006' for the purposes of bushfire hazard determination and Australian Standard 3959 - 2009 titled 'Construction of buildings in bushfire-prone areas'.

A company representative has made a site inspection of the subject property and the surrounding area. The plans by Sarkis Hill Architects have been relied upon for this assessment.

5.0 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

	North	East	South	West
Vegetation Structure	Maintained Curtilages	Forest	Maintained Curtilages	Maintained Curtilages
Slope	N/A	>20 degrees up	N/A	N/A
Minimum Required Asset Protection Zone	N/A	20 metres	N/A	N/A
Proposed Asset Protection Zone	N/A	>35 metres	N/A	N/A
Significant Environmental Features	Neighbouring residential allotments	Neighbouring residential allotments	Neighbouring residential allotments	Barrenjoey Road
Threatened Species	APZ existing	APZ existing	APZ existing	APZ existing
Aboriginal Relics	APZ existing	APZ existing	APZ existing	APZ existing
Bushfire Attack Level	N/A	BAL 19	N/A	N/A
Required Construction Level	BAL 19	BAL 19	BAL 19	BAL 12.5

Asset Protection Zones Compliance

The minimum required APZ under Table A2.4 of PBP – 2006 for the proposed granny flat is 20 metres to the east.

The proposed APZ for the both the alterations and additions to the existing dwelling and the proposed secondary dwelling is >35 metres to the east. The separation from the hazard interface includes maintained land within the subject property and land “*equivalent to an Asset Protection Zone*” within maintained neighbouring allotments.

Construction Level Compliance

The highest Bushfire Attack Level was determined from table 2.4.2 of AS3959 – 2009 to be BAL 19. The new works are required to comply with BAL 19 Section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006. In accordance with s3.5 of AS3959 – 2009 the new works on the western elevations can be downgraded to BAL 12.5.

Retrofitting recommendations are also required to prevent the entry of smoke and embers into the existing dwelling. This is to be achieved by enclosing all openings or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.

Access and Services

Guideline Ref.	Development Determinations	Compliance
Property Access (Driveway)	The most distant external point of the proposed secondary dwelling is less than 70 metres from a public road supporting a hydrant network and therefore the Property Access requirements detailed in section 4.1.3 (2) of PBP are not applicable. The existing access is being improved as part of this DA.	Yes
Water Supply	The most distant external point of the building footprint will be less than 70 metres from a public road supporting a hydrant network and therefore a Static Water Supply is not required.	Yes
Evacuation	Evacuation is possible by utilising existing road infrastructure. It is encouraged that the occupants complete a Bush Fire Safety Plan addressing "Prepare, Act, Survive" as advocated by the NSW RFS http://www.rfs.nsw.gov.au/publications / bushfire safety	Yes
Electrical Supply	Supply provided.	N/A

6.0 Aerial view of the subject allotment

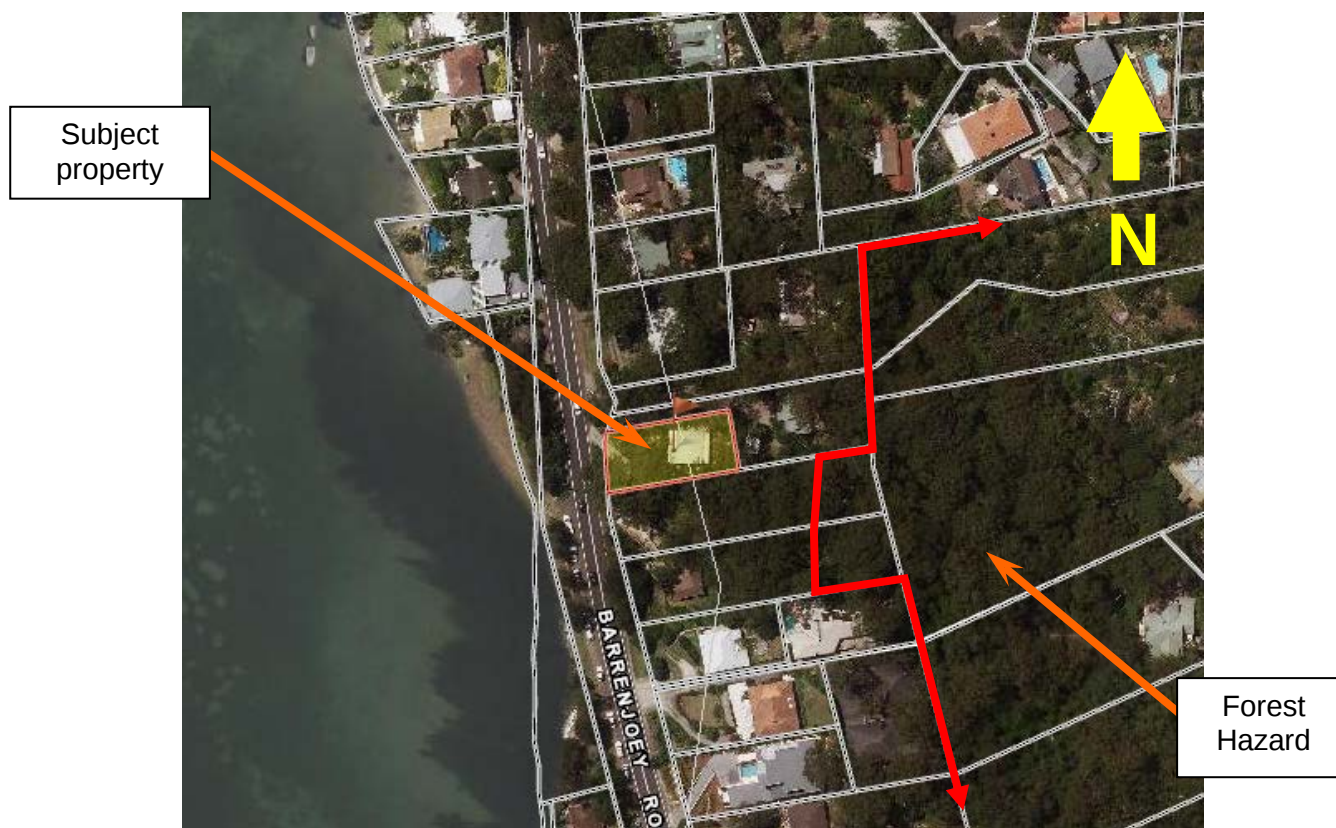


Image 01: Aerial view of the subject area Land and Property Management Authority 2016

7.0 Bushfire Hazard Assessment

7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bush Fire Protection - 2006' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2009 'Construction of buildings in bushfire prone areas'.

Planning for Bush Fire Protection – 2006, (PBP) formally adopted on the 1st March 2007 and amended May 2010 (Appendix 3) provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject development relates to the alterations and additions to an existing dwelling and the construction of a granny flat, effectively a dual occupancy arrangement within an existing residential allotment. To accord with PBP the development is classified as infill development and assessed as a 79ba application under the *Environmental Planning and Assessment Act 1979*.

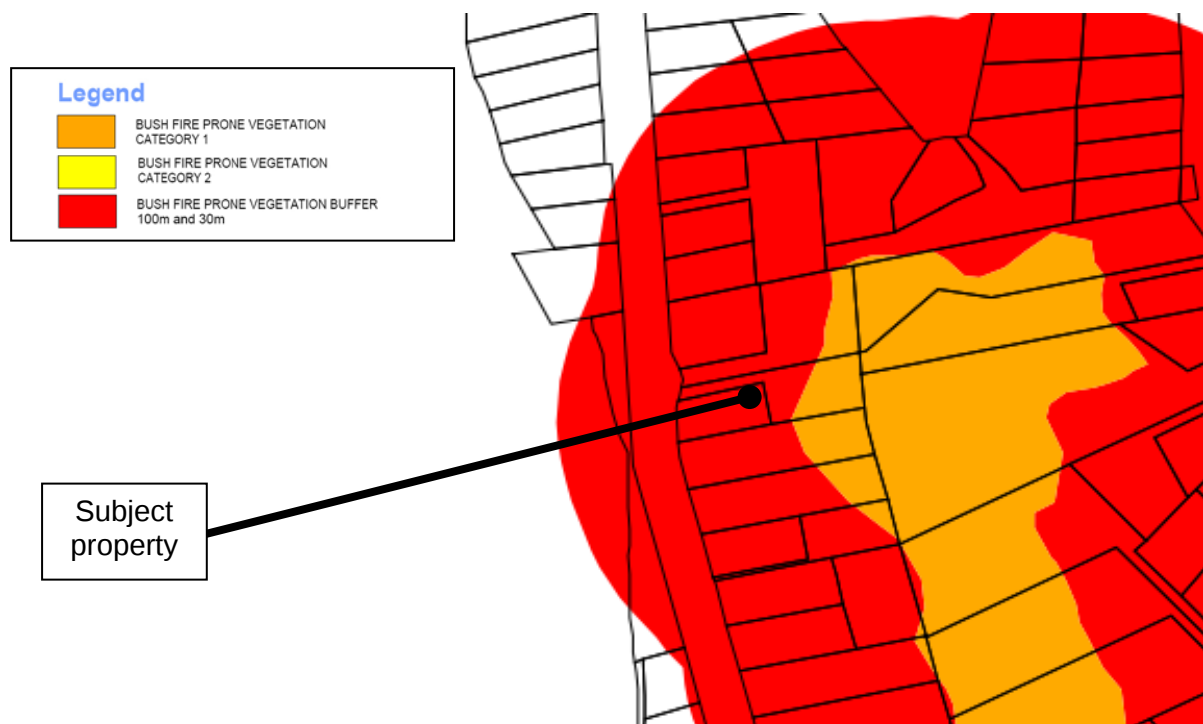


Image 02: Extract from Pittwater Council's Bushfire Prone Land Map

7.02 Location

The subject property is known as 828 Barrenjoey Road, Palm Beach (Lot 41 DP 771130) and is a residential allotment located within Pittwater Councils Local Government Area. The subject property has street frontage to Barrenjoey Road to the west and abuts similar residential allotments to the remaining three aspects. The vegetation identified as being the hazard is to the east of the proposed development within neighbouring residential allotments.



Photograph 01: View east from Barrenjoey Road toward the subject property



Image 03: Extract from street-directory.com.au

7.03 Vegetation

The vegetation within the subject property and the front portion of the neighbouring properties to the north and south was found to be managed land with landscaped gardens and mown lawns. The vegetation identified as being the hazard is to the east of the proposed development within neighbouring residential allotments.

The vegetation posing a hazard was found to consist of trees 10 – 30 metres in height with 30-70% canopy cover and an understorey of weeds, low shrubs and grasses. For the purpose of assessment under *Planning for Bush Fire Protection*, the vegetation posing a hazard has been determined to be Forest.



Photograph 02: View east within the neighbouring allotment to the south



Photograph 03: View southeast into the neighbouring allotment

7.04 Slope and Topography

The slope that would most significantly influence bushfire behaviour must be assessed for a distance of 100 metres.

The most significant bushfire impact from the east is expected to be a bushfire travelling down slope toward the subject property.

The slope that would most significantly influence fire behaviour was measured onsite using an inclinometer and verified from topographic imagery of the subject area and found to be:

- >20 degrees up slope within the hazard to the east



Image 06: Extract from Land and Property Management Authority Spatial Information Exchange

7.05 Asset Protection Zones

The alterations and additions and proposed granny flat will be located >35 metres from the hazard interface to the east. The separation from the hazard interface includes maintained land within the subject property and land equivalent to an APZ within neighbouring allotments.

All grounds within the subject property not built upon are required to be maintained as an Asset Protection Zone (Inner Protection Area) in accordance with Appendix 2 of PBP.



Photograph 04: View west along the southern neighbouring property, forming part of the APZ

7.06 Fire Fighting Water Supply

The subject dwelling is connected to the reticulated town's water main for its domestic needs. There are in ground hydrants along Barrenjoey Road for the replenishment of firefighting vehicles. The most distant external point of the building footprint will be less than 70 metres from a public road supporting a hydrant network and therefore a static water supply is not required.

The existing water supply is considered adequate for the replenishment of attending fire services.

7.07 Property Access – Fire Services & Evacuation

The subject property has street frontage to Barrenjoey Road to the west. Persons seeking to egress the subject dwelling are able to do so via the existing access drive and road infrastructure.

The most distant external point of the building footprint will be less than 70 metres from a public road supporting a hydrant network and therefore the Property Access requirements detailed in section 4.1.3 (2) of PBP are not applicable. The existing access is not being altered as part of this DA.

Fire services will have free pedestrian access around the building footprint. Attending fire crews can access the hazard via the neighbouring allotments for hazard reduction or fire suppression activities.

Access for fire services and opportunities for occupant evacuation are considered adequate for this property.

8.0 Site & Bushfire Hazard Determination

8.01 Planning for Bush Fire Protection - 2006

Planning for Bush Fire Protection – 2006 (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- *within or within 100m of high or medium bushfire hazards; or*
- *within or within 30m of low bushfire hazards.*

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP as follows:

Eastern Aspect:

- a) Vegetation Structure Forest
- b) Slope >20 degrees up slope
- c) A >35 metre APZ is proposed
- d) The Bushfire Attack Level was determined to be 'BAL 19'

8.02 Australian Standard AS 3959 – 2009 'Construction of buildings in bushfire –prone areas'

The Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The standards specify construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2006 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under both standards.

8.02 Correlation between bushfire impact and BAL Rating

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

8.04 Site Specific Bushfire Hazard Determination

All property development must be assessed on an individual basis as broad-brush approaches of documents such as PBP may not be applicable in every instance. The development located at 828 Barrenjoey Road, Palm Beach was assessed against the requirements of *Planning for Bush Fire Protection* 2006 noting the following:

- a) The existing water supplies for firefighting purposes are adequate.
- b) Access to the subject property is available via Barrenjoey Road.
- c) Access to the hazard is available via Barrenjoey Road and neighbouring allotments without the need to enter the subject site.
- d) Recommendations for ongoing maintenance of the Asset Protection Zones within the subject property will be included.
- e) Retrofitting recommendation to upgrade the existing dwelling for protection from smoke and ember attack are required and will be included within this report.

8.05 Viable Construction Method

The objectives of Planning for Bush Fire Protection – 2006 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

The highest Bushfire Attack Level to the proposed secondary dwelling was determined from table 2.4.2 of AS3959 – 2009 to be BAL 19. The new works are required to comply with BAL 19 Section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006. In accordance with s3.5 of AS3959 – 2009 the new works on the eastern elevations can be downgraded and BAL 12.5.

Retrofitting recommendations are also required to prevent the entry of smoke and embers into the existing dwelling. This is to be achieved by enclosing all openings or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.

8.06 Risk Rating

In assessing the bushfire threat to the site and its structures it is important to have a holistic approach and assess the risk of a bushfire occurring and impacting the subject property. It is also important to include the risk the site poses to neighbouring properties.

Table 01 is an overview of risk to the subject dwelling. This model takes a holistic approach and assesses the risk of a bushfire occurring and impacting the site. This risk level can be reduced by either an increase in preparedness by the owners/occupants of the dwelling (e.g. good house keeping, maintained lawns & bushfire awareness) and/or hazard reduction activities by local fire agencies. Alternatively this risk level can increase if the preparedness level decreases and/or hazard reduction activities are neglected for the area.

The below matrix is for risk only, it does not reflect the Bushfire Attack Level determined within PBP 2006. Note: All new work will comply with the requirements of *Planning for Bush Fire Protection* 2006.

		CONSEQUENCE			
		Minor	Moderate	Major	Catastrophic
L I K E L I H O O D	Almost Certain	Moderate	High	Very High	Very High
	Likely	Low	Moderate	High	Very High
	Possible	Insignificant	Low	Moderate	High
	Unlikely	Insignificant	Insignificant	Low	Moderate

Table 01: Risk Matrix

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2006. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

Asset Protection Zones

1. That all grounds not built upon within the subject property to be maintained as an Asset Protection Zone (Inner Protection Area) as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 2 of *Planning for Bush Fire Protection* 2006.

Construction

2. That any new roofing and works facing north, south and east are to be constructed to comply with BAL 19 Section 6 under AS 3959 – 2009.
3. That the new works facing west are to be constructed to comply with BAL 12.5 Section 5 under AS 3959 – 2009.
4. That the proposed works be constructed to that of the 'Additional Construction Requirements' detailed in A3.7 of the Addendum to Appendix 3 of Planning for Bush Fire Protection 2006 and NSW Rural Fire Service Fast Facts, Development Control Notes and Practice Notes.
5. That the existing dwelling be upgraded for smoke and ember protection. This is to be achieved by enclosing all openings or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.

Services

6. Electricity and gas are to comply with section 4.1.3 of Planning for Bush Fire Protection 2006.

Gas:

- Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities.
- Metal piping is to be used.
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation.
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion.
- Connections to and from gas cylinders are metal.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

Electricity:

- Where practicable, electrical transmission lines are underground.
- Where overhead electrical transmission lines are proposed:
 - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

10.0 Conclusion

Given that the property is deemed bushfire prone under Pittwater Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2006. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The subject property has street frontage to Barrenjoey Road to the west and abuts similar residential allotments to the remaining three aspects. The vegetation identified as being the hazard is to the east of the proposed development within neighbouring residential allotments. The vegetation posing a hazard was determined to be Forest on a >20 degree up slope.

The proposed alterations and additions and granny flat will be located >35 metres from the hazard interface to the east. The separation from the hazard interface includes maintained land within the subject property and land equivalent to an APZ within neighbouring allotments.

The new works are required to comply with BAL 19 Section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006. In accordance with s3.5 of AS3959 – 2009 the new works facing west can be downgraded to BAL 12.5 under Section 5 under AS 3959 – 2009 and Appendix 3 under PBP 2006.

Proposed access and existing water supply are considered adequate.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development and also satisfy both the Rural Fire Service's concerns and those of Council in this area.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions



Duncan Armour

Reviewed and endorsed by
Building Code & Bushfire Hazard Solutions



Wayne Tucker

G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Ass Dip Applied Science
Manager - Bushfire Section
Building Code and Bushfire Hazard Solutions
Fire Protection Association of Australia BPAD – A Certified Practitioner
Certification number – BPD – PA-09399



Disclaimer:

Quote from *Planning for Bush Fire Protection* 2006, 'Any representation, statement opinion, or advice expressed or implied in this publication is made in good faith on the basis that the State of New South Wales, the NSW Rural Fire Service, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above..'

Similarly the interpretations and opinions provided by Building Code and Bushfire Hazard Solutions in regard to bushfire protection are also given in the same good faith.

11.0 Annexure 01

List of Referenced Documents

- a) *Environmental Planning and Assessment Act* - 1979
- b) 'Planning for Bush Fire Protection'- 2006 - NSW Rural Fire Services & Planning NSW
- c) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2009 (as - amended) – Standards Australia
- d) 'Pittwater Council's Bushfire Prone Land Map'
- e) Plans by Sarkis Hill Architects
- f) Acknowledgements to:
NSW Department of Lands – SIXMaps
Street-directory.com.au

Attachments

Attachment 01: 79BA Compliance Certificate



Building Code & Bushfire Hazard Solutions

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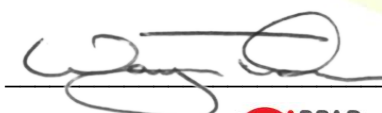
BUSHFIRE RISK ASSESSMENT CERTIFICATE UNDER s79BA OF THE EP&A Act 1979

PROPERTY ADDRESS:	828 Barrenjoey Road, Palm Beach
DESCRIPTION OF PROPOSAL:	Alterations and Additions
PLAN REFERENCE: (relied upon in report preparation)	Plans by Sarkis Hill Architects
BAL RATING:	BAL 19 (If the BAL rating is FZ the application is to be referred to NSW RFS for assessment)
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	YES ☐ NO ☒ (Circle the relevant response) (If YES the application is to be referred to NSW RFS for assessment)
BUSHFIRE ASSESSMENT REPORT REFERENCE:	160581
REPORT DATE:	20 th January 2016
CERTIFICATION NO/ACCREDITED SCHEME	BPAD9399

I Wayne Tucker of Building Code and Bushfire Hazard Solutions Pty Ltd 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 Bushfire Risk Assessment Report the proposed development conforms specifications and requirements of the documents entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other documents as prescribed by Section 79BA 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 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*.

Signature:  Date: 20th January 2016

