AUSTRALIAN BUSHFIRE CONSULTING SERVICES



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Bush Fire Assessment Report



Residential alterations and additions

57 Nandi Avenue Frenchs Forest NSW 2086

2nd September 2019 Reference 19-232

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Abbreviations:

ABCS	Australian Bushfire Consulting Services Pty Ltd
APZ	Asset Protection Zone
AS2419.1 2017	Fire hydrant installations System design, installation and commissioning
AS3959 - 2009	Australian Standard 3959 – 2009 Construction of buildings in bushfire prone areas including amendments 1-3
AS3959 - 2018	Australian Standard 3959 – 2018 Construction of buildings in bushfire prone areas
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FR NSW	Fire & Rescue NSW
IPA	Inner Protection Area
LGA	Local Government Area
NCC	National Construction Codes
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP 2006	Planning for Bush Fire Protection – 2006
PBP 2018	pre-release Planning for Bushfire Protection – 2018
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEARs	Planning Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply
URA	Urban Release Area

1.0 Introduction.

The development seeks approval for the alterations and additions to an existing dwelling house within an existing allotment at 57 Nandi Avenue, Frenchs Forest, NSW. The subject site is mapped as bushfire prone land and therefore the application of Planning for Bush Fire Protection 2006 (PBP 2006) is relevant to the development proposal.

The aims of PBP 2006 are to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment. This is achieved by determining available asset protection zones (APZs), applying the relevant construction requirements, ensuring adequate access and egress has been considered, providing safe service supply and adequate water provisions for occupants and attending emergency services.

2.0 Property details.

Address:57 Nandi Avenue, Frenchs Forest, NSW 2086Lot/DP:Lot 58 DP 221359Zoned:R2 Low Density ResidentialLGA:Northern Beaches Council

The site has street frontage to Nandi Avenue to the east and abuts similar developed residential properties to the remaining three aspects. A large Reserve is located to the north and west of the subject site beyond neighbouring properties and Nandi Avenue. I undertook an inspection of the property on 22/8/2019, at that time free access was available within the subject site and the Reserve to the north of the subject site. There was limited access into the Reserve to the east, however clear views into this area were available.

3.0 Legislative context.

The development is classified as infill development and assessed under Section 4.14 of the Environmental Planning and Assessment Act 1979. Under this Act Council can determine a development application on bushfire prone land providing;

Council is satisfied that the development conforms to the specifications and requirements of *Planning for Bush Fire Protection* that are relevant to the development or

Council has been provided with a certificate by a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment stating that the development conforms to the relevant specifications and requirements *Planning for Bush Fire Protection*.

If the Council is satisfied that the development does not conform to the relevant specifications and requirements of *Planning for Bush Fire Protection* Council may grant consent but only if it has consulted with the Commissioner of the NSW Rural Fire Service concerning measures to be taken with respect to the development to protect persons, property and the environment from danger that may arise from a bush fire.

The highest bushfire attack level (BAL) to the proposed new works has been determined to be BAL 12.5. Suitable recommendations have been made herein to enable Council to issue development consent inclusive of conditions required to ensure compliance with both *AS3959 – 2009 Construction of buildings in bushfire prone areas* (AS3959-2009) and *Planning for Bush Fire Protection 2006* (PBP 2006).

The proposal meets the aims and objectives of PBP 2006 by means of compliance with the deemed to satisfy provisions of this document. I am a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment and I have attached a certificate to this report satisfying the requirements of s4.14. As such Council can approve the application without referral to the NSW Rural Fire Service.

4.0 Referenced documents and people.

The following documents have been referenced in the preparation of this report;

- Warringah Local Environmental Plan 2011,
- Warringah Development Control Plan 2011 (amended May 2016),
- Northern Beaches Council's Bushfire Prone Land Map,
- AS3959 2009 Construction of buildings in bushfire prone areas,
- Planning for Bush Fire Protection 2006,
- Rural Fires Act 1997
- Rural Fires Regulation 2013
- 10/50 Vegetation Clearing Code of Practice,
- NSW RFS Guide for bush fire prone land mapping V5b Nov 2015,
- Ocean Shores to Desert Dunes David Andrew Keith 2004,

The Site Plan, Floor Plan & Elevations by Blue Sky Building Design Ref 2019016 Sheets A101-103 & A107-108 have been reviewed and relied upon in preparation of this report.

5.0 Copyright, scope and disclaimer.

This assessment of possible bushfire impact (including smoke, ember, radiant heat and flame contact) and compliance with matters such as Asset Protection Zones, access and service supply is pertinent to the subject site only. Where reference has been made to the surrounding lands, this report does not assess impact to those lands rather it is an assessment of possible bushfire progression and impact on or from those lands towards the subject site.

Apart from any use permitted under the Copyright Act 1968 no part of this document, including any wording, images, or graphics, can be modified, changed or altered in any way without written permission from Australian Bushfire Consulting Services Pty Ltd. This report may only be referenced, distributed or forwarded to other parties in its original format.

This report has been prepared as a submission document in support of a development application to Council and cannot be relied upon for commencement of works or construction until it has been included within the consent conditions issued by Council as part of the DA determination. The onus is on the applicant to cross reference this document with any conditions of consent issued by Council or any comments provided by the NSW Rural Fire Service. I can review and cross reference these documents however the onus is on the applicant / client to provide them to me and request this review.

Where any difference between this document and the development consent (or the NSW Rural Fire Service comments) is found, the conditions of consent always take precedence until an application to review, amend or vary those conditions is approved.

The statements and opinions contained in this report are given in good faith and in the belief that such statements and opinions are correct and not misleading. AS3959 – 2009 states that "...there can be no guarantee that a building will survive a bushfire event of every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions". The NSW RFS state "Homes are not designed to withstand fires in catastrophic conditions". Correspondingly any representation, statement of opinion, or advice expressed or implied in this document is made on the basis that Australian Bushfire Consulting Services Pty Ltd is not liable 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 made by Australian Bushfire Consulting Services Pty Ltd.

6.0 Assessment summary table.

Aspect	North	West	East	South	
Vegetation Structure	Forest	Forest	Maintained land	Maintained land	
Hazard slope	0-5° downslope	0° & upslope	n/a	n/a	
Existing APZ	≥100 metres	≥73 metres	n/a	n/a	
Features that may mitigate the impact of bush fire on the proposed development.	The separation from the hazard interface includes maintained land within the subject property and existing maintained land within neighbouring residential allotments and Nandi Avenue road reserve.				
Noteworthy landform & environmental features.	Neighbouring dwellings & Nandi Avenue	Neighbouring dwellings & Nandi Avenue	Nandi Avenue & neighbouring dwellings	Neighbouring dwellings	
Bushfire Attack Level	BAL 12.5	BAL 12.5	n/a	n/a	
Required Construction Level	The highest Bushfire Attack Level to the proposed new works was determined from Table 2.4.2 of AS3959 – 2009 to be 'BAL 12.5'. The proposed new works are required to comply with section 3 and 5 BAL 12.5 of AS 3959 – 2009 and the additional requirements detailed within Addendum Appendix 3 under PBP 2006.				

Guideline Ref.	Proposed Development Determinations			
Property Access	The most disadvantaged point of the existing dwelling and proposed new works is less than 70 metres from a public through road that supports the operational use of fire appliances (hydrants) and therefore the property access requirements of s4.1.3 (2) of PBF 2006 are not applicable.			
Water Supply	The subject site is connected to reticulated water mains for domestic needs. Hydrants are located along Nandi Avenue and surrounding streets available for the replenishment of firefighting appliances, with the nearest hydrant located northeast of the subject site on the eastern side of Nandi Avenue. Existing water supply is considered satisfactory for this development and a static water supply is not required.			
Gas & Existing above ground electrical supply is provided to the subject site and nature available in this area. Recommendations will be included that any new electric connection to the dwelling complies with s4.1.3 of PBP 2006.				
Evacuation Occupants are encouraged to complete a Bush Fire Safety Plan addressing "Prepare Survive" as advocated by the NSW RFS http://www.rfs.nsw.gov.au/ under publication bushfire safety.				

7.0 Images and maps.



Image 01: Aerial image from NSW Gov SIXMaps dataset



Image 02: 10 metre Topographic image from NSW Gov SIXMaps dataset



Image 03: Extract of Councils Bushfire Prone Land Map from Dept. Planning Property Information



Image 04: Extract from street-directory.com.au



Image 05: Extract from Council LEP Zone Maps from Dept. Planning Property Information

8.0 Bushfire hazard assessment

Properties considered to be bushfire prone land are identified on Councils Bushfire Prone Land Map as being:

- within or within 100 m of Category 1 (high) hazards or,
- within or within 30 m of Category 2 (low) hazards or,
- within or within 30 m of Category 3 (medium) hazards.

The NSW RFS document PBP – 2006 is applicable to all development on bushfire prone land, this includes an assessment of the proposals adequacy in providing an appropriate combination of bushfire protection measures in terms of asset protections zones, landscaping, access and service supply. This document also provides a means of determining the necessary level of building construction under AS3959 - 2009. All infill development on bushfire prone land must be accompanied with a bushfire hazard assessment that includes;

- a statement that the site is bush fire prone land, where applicable,
- the location, extent and vegetation formation of any bushland on or within 100 metres of the site,
- the slope and aspect of the site and of any bush fire prone land within 100 metres of the site, which may determine the likely path of any bush fires,
- any features on or adjoining the site that may mitigate the impact of a high intensity bush fire on the proposed development, and
- a statement assessing the likely environmental impact of any proposed Bush Fire Protection Measures.
- whether any building is capable of complying with AS 3959-2009 in relation to the construction level for bush fire protection.

By incorporating bush fire protection measures into a development, the six objectives of PBP 2006 are addressed:

- 1. afford occupants of any building adequate protection from exposure to a bush fire
- 2. provide for a defendable space to be located around buildings
- 3. provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition
- 4. ensure that safe operational access and egress for emergency service personnel and residents is available
- 5. provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)
- 6. ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush firefighting).



Image 06: Extract from PBP 2006 illustrating bush fire protection measures in combination.

8.1 Site

The site has street frontage to Nandi Avenue to the east and abuts similar developed residential properties to the remaining three aspects.

Councils Bushfire Prone Land Map identifies this property as being partly within the 100 metre buffer zone from Category 1 Vegetation and therefore it is appropriate to apply PBP 2006. The Bushfire Prone Land Map is not an indication of risk and is simply a trigger for a detailed site assessment and bushfire hazard analysis to be undertaken.





8.2 Vegetation

The vegetation must be assessed for a distance of 140 metres from the proposed development. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

The vegetation identified as the bushfire threat to the proposed new works is located within large Reserve to the north and west of the subject site beyond neighbouring properties and Nandi Avenue. The vegetation was found to consist of trees 15-25 metres tall with an understory of smaller trees and shrubs. To the north there was also found mown lawns along the perimeter of the Reserve. For the purpose of assessment under Addendum Appendix 3 PBP 2006 and AS3959 – 2009 the Vegetation has been determined to be a Forest.



Photograph 02: View north within the Reserve to the north of the subject site



Photograph 03: View of mown lawns within the Reserve to the north of the subject site

8.3 **Topography**

The slope must be assessed over a distance of at least 100 m from the existing property boundary (or proposed building footprint) towards the various vegetation communities constituting the hazard. In assessing the slope, it may be found that there are a variety of slopes covering different distances. The gradient within the hazard (vegetation) which will most significantly influence the fire behaviour must be determined.

The most influential slope within the hazard has been assessed onsite using an inclinometer and verified by contour topographic mapping to be;

- > 0-5° downslope to the north
- > 0° and upslope to the west

8.4 Asset Protection Zones

The subject site and neighbouring residential allotments contained maintain land around the built assets. The separation from the hazard interface has been measured to be \geq 100 metres to the north and > 73 metres to the west and includes land within the subject property and land considered equivalent to an asset protection zone being existing maintained land within the northern neighbouring properties.

The APZ is in essence existing and no tree removal is necessary to create it, as such there is no significant impact on the environment from the proposed bushfire protection measures. Onsite maintenance that is required is management of the fuels at the shrub and ground levels. This includes removal of dead and fallen leaf litter, dead palm fonds etc. Recommendations for ongoing property maintenance within the subject site will be included within this report.

8.5 Services

Existing above ground electrical supply is provided to the subject site and natural gas is available in this area. Recommendations will be included that any new electrical or gas connection to the dwelling complies with s4.1.3 of PBP 2006.

The subject site is connected to reticulated water mains for domestic needs. Hydrants are located along Nandi Avenue and surrounding streets available for the replenishment of firefighting appliances, with the nearest hydrant located northeast of the subject site on the eastern side of Nandi Avenue. Existing water supply is considered satisfactory for this development and a static water supply is not required.



Photograph 04: View of southwest from an existing hydrant in Nandi Street towards the subject site

8.6 Access & egress

Fire services will have free pedestrian access around the existing and future building footprints. Access to the hazard interface is available via neighbouring private allotments and Nandi Avenue without the need to enter the subject site.

The most disadvantaged point of the existing dwelling and proposed new works is less than 70 metres from a public through road that supports the operational use of fire appliances (hydrants) and therefore the property access requirements of s4.1.3 (2) of PBP 2006 are not applicable.

Occupants are encouraged to complete a Bush Fire Safety Plan addressing "Prepare, Act, Survive" as advocated by the NSW RFS http://www.rfs.nsw.gov.au/ under publications / bushfire safety.

8.7 Construction

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 Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bushfire 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 AS3959 - 2009.

The highest Bushfire Attack Level to the proposed new works was determined from Table 2.4.2 of AS3959 – 2009 to be 'BAL 12.5'. The proposed new works are required to comply with section 3 and 5 BAL 12.5 of AS 3959 – 2009 and the additional requirements detailed within Addendum Appendix 3 under PBP 2006.

8.8 Risk

The level of risk is determined using the combination of likelihood and consequences. The purpose of analysing risk is to establish an understanding of the level of bushfire threat and will help to evaluate the appropriateness of bushfire protection measures recommended for a development application.

This section of the report is a predictive risk evaluation only and assumes development consent includes the recommendations contained within this report. It has been based on an abridged version of the assessment process detailed within the Bush Fire Risk Management Planning Guidelines for Bushfire Risk Management Committees. This evaluation does not reflect the Bushfire Attack Level determined under PBP 2006 or AS3959 - 2009.

The likelihood of a bush fire occurring can be determined using fire history data or local knowledge. The likelihood must be considered in the context of long term planning and not simply if a bush fire is likely to occur during the next five years. The consequences of a bush fire event can be determined by considering the vulnerability of the asset. Vulnerability is related to the capacity of an asset to cope with or recover from the impacts of a bush fire.

Likelihood Rating	Description and indicative probability				
Almost certain	Expected to occur, many recorded incidents, strong anecdotal evidence, high opportunity, reason or means to occur; may occur or be exceeded once in every 5 years.				
Likely	Will probably occur; consistent record of incidents and good anecdotal evidence; considerable opportunity, reason or means to occur; may occur or be exceeded once in every 10 years.				
Possible	Might occur; a few recorded incidents in each locality and some anecdotal evidence; some opportunity, reason or means to occur; may occur or be exceeded once in every 20 years.				
Unlikely	Is not expected to occur; isolated recorded incidents in this community, anecdotal evidence in other communities; little opportunity, reason or means to occur;				

Consequence Rating	Description and indicative result		
Minor	Inconsequential or no damage. Little or no disruption to occupation. Little or no financial loss.		
Moderate	Localised damage that is rectified by routine arrangements. Normal functioning with some inconvenience. Localised displacement of people who return within 24 hours. Personal support satisfied through local arrangements.		
MajorSignificant damage that requires external resources. Displacement for 24 hours duration. Extensive resources required for personal support.			
Catastrophic	Extensive damage. Extensive personal support. General and widespread displacement for extended durations.		

Consequence Likelihood	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	Extreme
Possible	Insignificant	Low	Medium	High
Unlikely	Insignificant	Insignificant	Low	Medium

The bushfire risk to this development is determined to be <u>insignificant</u> and the package of bushfire protection measures recommended in section 9 of this report for the proposed new works are considered <u>satisfactory</u>.

9.0 **Recommendations**

9.1 Asset Protection Zones / landscaping

- 1. That all grounds within the subject property are 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 Bushfire Protection 2006.
- 2. That any new landscaping is to comply with Appendix 5 'Landscaping and Property Maintenance' under Planning for Bushfire Protection 2006.

9.2 Construction

- 3. That all new construction shall comply with section 3 and 5 (BAL 12.5) of Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas'.
- 4. That all new construction shall also comply section A3.7 Addendum Appendix 3 of "Planning for Bush Fire Protection (2010).

9.3 Services

Electricity

- 5. That any new electricity supply to the is to comply with section 4.1.3 of Planning for Bush Fire Protection 2006, in particular;
 - 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).

Gas

6. That the location of any new gas services will not lead to ignition of surrounding bush land or the fabric of buildings by;

Bottled Gas;

- Bottled gas is installed and maintained in accordance with AS 1596 2002 and the requirements of relevant authorities. Metal piping is to be used.
- All fixed LPG tanks are kept clear of all flammable materials and located on the non-hazard side of the development.
- If gas cylinders need to be kept close to the building, the release valves must be directed away from the building and away from any combustible material, so that they do not act as catalysts to combustion.

Reticulated gas;

- Reticulated gas is installed and maintained in accordance with AS 1596-2002 and the requirements of relevant authorities.
- Metal piping is to be used. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

10.0 Conclusion

The National Construction Code 2016 (NCC) Volume 2 requires that a Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and intensity of the bushfire attack on the building.

The subject property is determined to be bushfire prone land and the proposal must achieve compliance with the NCC by meeting the aims and objectives of PBP 2006. This is achieved by providing construction measures to mitigate against the impacts from bush fire including smoke, embers, radiant heat and flame contact, and also including suitable access, services supply and means of maintaining the bushfire protection measures for the life of the development.

This bushfire hazard and determination has been made on a site-specific basis which includes an assessment of the local bushland area and its possible impact to the subject property. The highest Bushfire Attack Level to the proposed new works was determined from Table 2.4.2 of AS3959 - 2009 to be 'BAL 12.5'. Suitable recommendations have been made herein to enable Council to issue development consent inclusive of conditions required to ensure compliance with the construction requirements of AS3959 – 2009 and all other requirements of PBP 2006.

The proposal meets the aims and objectives of PBP 2006 and AS3959-2009 by means of compliance with the deemed to satisfy provisions of these documents. I am a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment and I have attached a certificate to this report satisfying the requirements of s4.14. As such Council can approve the application without referral to the NSW Rural Fire Service.

In consideration of the bushfire risk posed to the proposed development and in conjunction with the recommended bushfire protection measures contained within this report I am satisfied they will provide a reasonable and satisfactory level of bushfire protection to the proposed development.

I am therefore in support of the development application.

Australian Bushfire Consulting Services Pty Ltd

Wayne Tucker Managing Director G. D. Design in Bushfire Prone Areas. Certificate IV Fire Technology Ass Dip Applied Science FPA Australia BPAD Level 3 Accredited Practitioner BPAD Accreditation No. BPAD9399



List of attachments

Attachment 01: s4.14 Certificate

USTRALIAN BUSHFIRE ONSULTING SERVICES



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BUSH FIRE RISK ASSESSMENT CERTIFICATE

Issued in accordance with Section 4.14 of the Environmental Planning Act 1979 No.203

PROPERTY DETAILS	57 Nandi Avenue, Frenchs Forest, NSW 2086 Lot 58 DP 221359				
DEVELOPMENT TYPE	Infill – alterations and additions to existing sole occupancy dwelling house				
PLAN REFERENCE	Site Plan, Floor Plan & Elevations by Blue Sky Building Design Ref 2019016 Sheets A101-103 & A107-108				
BAL RATING	BAL 12.5	<u>NOTE</u> - If BAL FZ the application is to be referred to the NSW RFS.			
ARE ALTERNATE SOLUTIONS REQUIRED	No	NOTE - If YES the application is to be referred to the NSW RFS.			
IS REFERRAL TO NSW RFS REQUIRED	No	ABCS REF.	19-232	Issue date:	2 nd September 2019

I *Wayne Tucker,* of Australian Bushfire Consulting Services Pty. Ltd., hereby certify in accordance with Section 4.14 of the Environmental Planning Act 1979 No.203 that –

- 1. I am a person recognized by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment and
- 2. Subject to the recommendations contained in the Bushfire Risk Assessment Report, the proposed development conforms to specifications and requirements of the document entitled Planning for Bushfire *Protection* (prepared by the NSW Rural Fire Service in co-operation with the Department of Planning) and any other documents as prescribed by Section 4.14 of the Environmental Planning and Assessment Act 1979 No.203.

Further, I am aware that the Bushfire Risk Assessment Report prepared for the abovementioned site is to be submitted in support of a Development Application for this site. This report 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 the document entitled Planning for Bushfire Protection 2006.

Australian Bushfire Consulting Services;

RPAD

Wayne Tucker Managing Director. G. D. Design in Bushfire Prone Areas. Certificate IV Fire Technology Ass Dip Applied Science FPA Australia BPAD Level 3 Accredited Practitioner BPAD Accreditation No. BPAD9399