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PO Box 363 Balgowlah, NSW, 2093

Bush Fire Assessment Report

In relation to a proposed development at:

16 Amaroo Avenue, Elanora Heights, NSW


This assessment has been prepared and certified by: Matthew Toghil. BPAD certified practitioner FPAA Accreditation No: BPAD31642 Report No: 16Ama-01 Date: 07/06/2021	
Architectural plans provided by:	Walsh Architects Dated: 06.04.2021 (No. A)

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Executive Summary

The purpose of the report is to determine the category of bushfire attack and subsequent construction standard for the proposed alterations and additions to the existing dwelling at No 16 Amaroo Avenue, Elanora Heights, NSW

The site had been identified as 'bush fire prone land' for the purpose of Section 146 of the *Environmental Planning and Assessment Act 1979* and the Legislative requirements for building on bush fire prone lands are applicable.

The proposed development is in infill development as defined within Chapter 7 of *Planning for Bushfire Protection 2019* and this report has been prepared in accordance with the requirements of Section 4.14 of the Environment Planning and Assessment Act.

This assessment includes an analysis of the hazard, threat and subsequent risk of the development proposal and provides recommendations that satisfy the Objective and Performance requirements of the Building Code of Australia, Planning for Bushfire Protection 2019 [PBP] and Australian Standard AS3959, 2018.

The Bushfire Attack Level (BAL) was determined to be Flame Zone (BAL-FZ), in accordance with the methodology described in PBP.

1. Description of the subject property

Property address: Lot 173 DP 224239, No 16 Amaroo Avenue, Elanora Heights

Local Government Area: Northern Beaches

The development site is a residential block on the northern side of Amaroo Avenue. The following sections 4-8 describe in detail the vegetation, slope, access and egress, availability of water supplies and environmental considerations for the site.

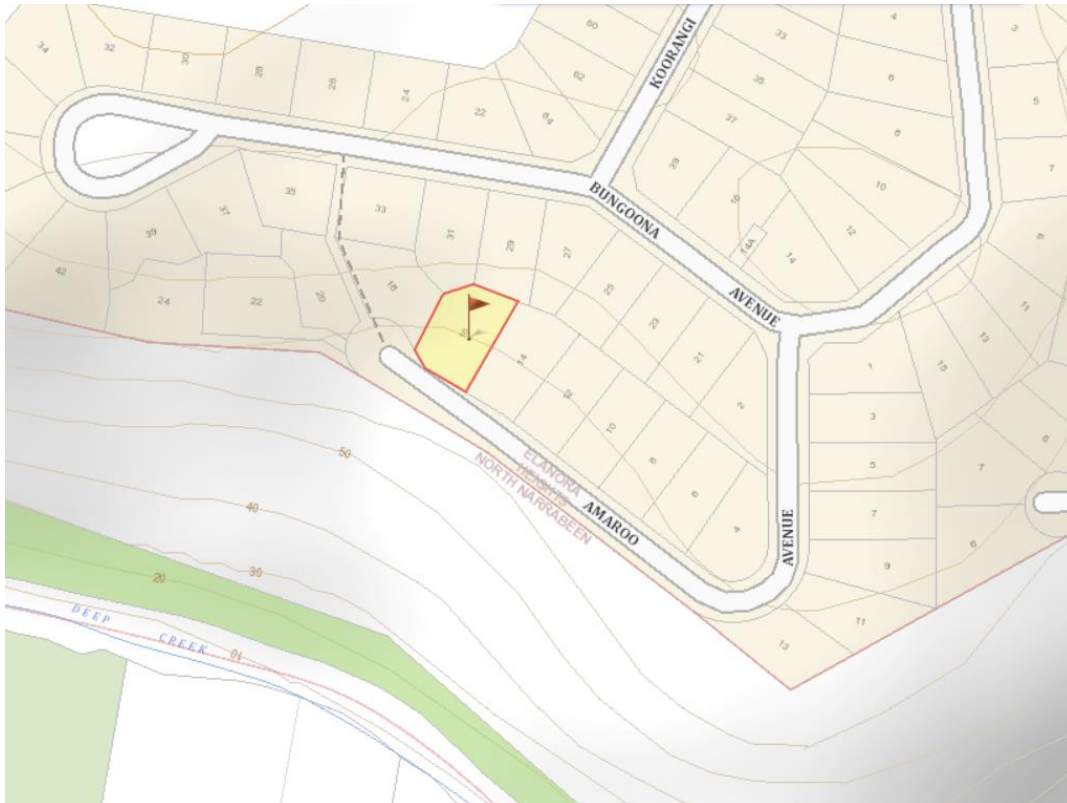


Figure 1: Location of the subject site

3. Classification of the Vegetation on and surrounding the site

For the purpose of a Bush Fire Risk Assessment, vegetation within 140m of the site is assessed and classified.

In this instance there are two are within this area.

1. There is an area of Category 1 vegetation that lies to the south of the site. The vegetation formation within this area consists of North Coast Wet Sclerophyll Forest (Refer to Figure 5) and for the purpose of this assessment will be classified as 'Forest'.
2. There is an area of Category 1 vegetation that lies to north of the site. The vegetation formation within this area consists of Sydney Coastal Dry Sclerophyll Forest (Refer to Figure 5) and for the purpose of this assessment will be classified as 'Forest'.



Figure 4: Aerial photo showing vegetation within 140m of the site.

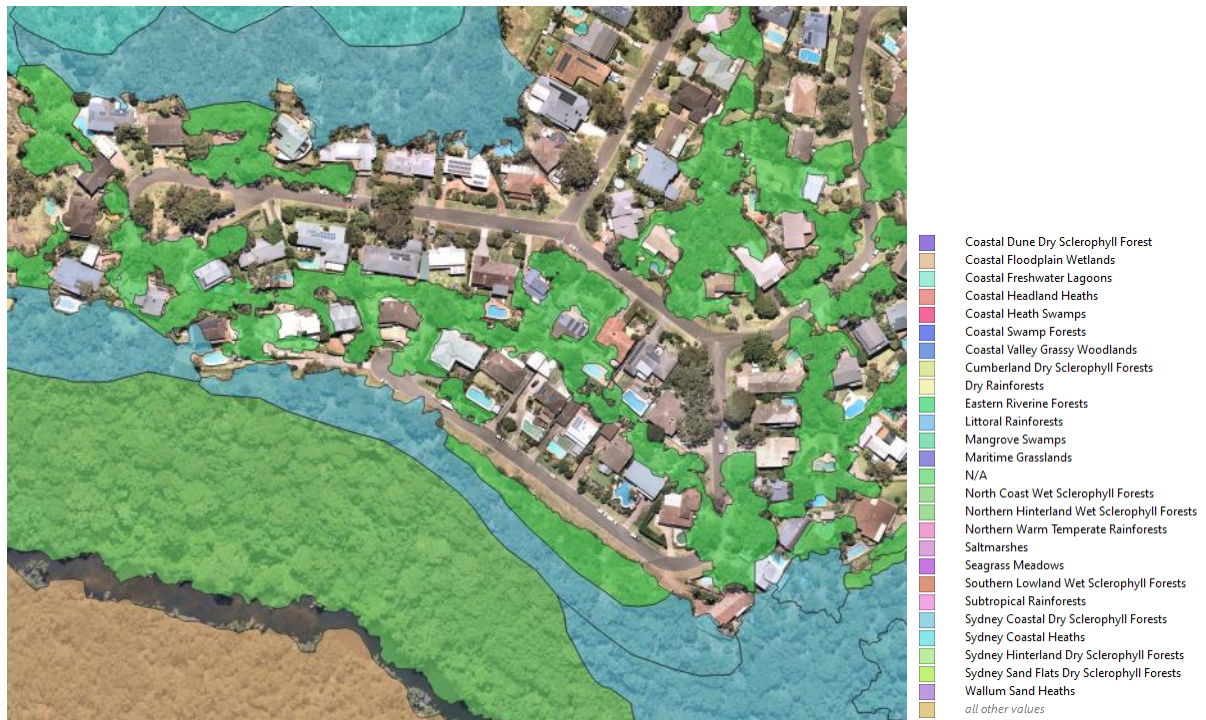


Figure 5: Aerial photo showing vegetation formations surrounding the subject site (Source: NSW Government Central Resource for Sharing and Enabling Environment Data)

4. Assessment of effective slope



Legend:

 Direction of effective slope

Figure 5: Contour map.

Transect Line	Effective slope
T1	Downslope 24 degrees*
T2	Downslope >5-10 degrees

**With reference to Clause A1.4 of Planning for Bush Fire Protection 2019, as the slope for T1 is greater than 20 degrees a performance-based assessment has been performed (Refer to Appendix 1).*

5. Access and Egress

The site has direct access to Amaroo Avenue, which is a public road, access and egress for emergency vehicles appears adequate.

6. Adequacy of water supply

The area has reticulated water supply and hydrants are spaced at a regular distance along Amaroo Avenue.

7. Features that may mitigate the impact of a high intensity bushfire

There are no significant features on or adjoining the site that may mitigate the impact of a high intensity bushfire on the proposed development.

8. Environmental impact of any proposed bushfire protection measures.

The scope of this report has not been to provide an environmental assessment. However, the bushfire protection measures that are proposed will have no adverse environmental effects. All protection measures are either within the boundaries of the allotment or part of the constructed building.

9. Bushfire Risk Assessment



Figure 6: Aerial photo showing subject site and distance to surrounding vegetation.

Table 1; reference Table A1.12.5 *Planning for Bush Fire Protection 2019*

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

Transect	Distance to classified vegetation	Vegetation Classification	Assessment of effective slope	FDI	Bushfire Attack Level
T1	24.95m	Forest	Downslope 22 degrees	100	BAL-FZ
T2	>100m	Forest	Downslope >5-10 degrees	100	BAL-Low

Summary: Based upon the relevant provisions of PBP the anticipated radiant heat attack for the site is >40kW/m² and the subsequent minimum construction standard is Flame Zone.

10. The extent to which the construction conforms or deviates from Chapter 7 of 'Planning for Bushfire Protection 2019'

Performance Criteria	How this development meets acceptable solutions
The intent may be achieved where:	
<u>In relation to APZ's:</u> -Defendable space is provided onsite. -An APZ is provided and maintained for the life of the building.	Defendable space is provided on all sides of the building. Asset protection zones are provided for on site and by adjoining development and public roads. An APZ cannot be provided on the southern side of the dwelling in accordance with the minimum requirements of PBP. Construction standards for development in the flame zone category of bushfire attack have been recommended.
<u>In relation to construction standards:</u> It is demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Construction standards have been recommended in accordance with the requirements of <i>Planning for Bushfire Protection 2019</i> and <i>AS 3959-2018 Construction of buildings in bushfire prone areas</i> .
<u>In relation to access requirements:</u> Safe operational access is provided [and maintained] for emergency service personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire.	This site has direct access to public roads, and the access and egress for emergency vehicles and evacuation appears to be adequate.
<u>In relation to water and utility services:</u> -Adequate water and electrical services are provided for fire fighting operations.	The area has reticulated water supply and the nearest street hydrant is within the minimum required distance from the most distant point of the subject site in accordance with the requirements of PBP and
<u>In relation to landscaping:</u> It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignition.	The subject site, where not built on, is considered part of the Asset Protection Zone (APZ) for the dwelling. Appendix 4 of <i>Planning for Bushfire Protection 2019</i> outlines the requirements for landscaping and property maintenance.
<u>In relation to emergency and evacuation planning</u>	It is advised the residents should complete a <i>Bushfire Survival Plan</i> as formulated by the NSW Rural Fire Service and Fire and Rescue NSW.

11. Recommendations

The following recommendations are made for the bushfire protection measures for the proposed alterations and additions to the existing dwelling at No 16 Amaroo Avenue, Elanora Heights, NSW and are based upon the relevant provisions of the NSW RFS guideline entitled *Planning for Bushfire Protection 2019*.

1) <u>Construction standard.</u>	New construction shall comply with a minimum standard of section 3 [construction general] and section 9 (BAL-FZ), AS3959-2018 and Chapter 7 of <i>Planning for Bushfire Protection 2019</i> .
2) <u>Asset Protection Zones</u>	At the commencement of building works and in the 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'.
3) <u>Emergency Risk Management</u>	It is advised 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 is not recommended as a condition of consent.
4) <u>Adjacent Structures [class 10a & 10b]</u>	Where Class 10a & 10b structures are within 6m from a dwelling in bush fire prone areas it must be built in accordance with the NCC.
5) <u>Water supplies</u>	Reticulated water supply is located on the adjoining road at regular intervals and is easily accessible. No additional water supplies have been recommended.
6) <u>Fences and gates</u>	All fences in bush fire prone areas should be made from either hardwood or non-combustible material. However, in circumstances where the fence connects directly to the dwelling, or in areas of BAL-29 or greater, they should be made of non-combustible material.

12. Summary

This report consists of a bushfire risk assessment for proposed alterations and additions to the existing dwelling at No 16 Amaroo Avenue, Elanora Heights, NSW

The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development of bushfire prone areas are applicable. The proposed development will be constructed to the minimum standard required in accordance with the guidelines of *Planning for Bushfire Protection 2019* and *AS 3959-2018 Construction of buildings in bushfire prone areas*.

This report has considered all of the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations of Section 11 of this report, it is my considered opinion that the development satisfies the Objectives and Performance requirements of the *Building Code of Australia, Planning for bushfire Protection 2019* and *Australian Standard AS3959, 2018*.

Note: Not with standing 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 a bushfire attack on every occasion. This report is a Bushfire Hazard Assessment that provides the required information to assist Local Councils and the Rural fire Service in determining compliance in accordance with Planning for Bushfire Protection 2019 and AS3959, 2018. The local Council is the final consenting authority and the construction of the building must comply with the recommendations included in the council's conditions of consent.



Matthew Toghil- Bushfire Consultant

Accreditation No: BPAD31642

Grad Cert in Bushfire Protection, UWS 2012

Certificate IV Building and Construction

Certificate III in Public Safety (firefighting and emergency operations)





BPAD-A Certified Practitioner/Certified Business - Certification No BPD-PA09328

Ron Coffey – Bushfire Safety Engineer

Grad I Fire E [Institute of Fire Engineers - 1973]

Grad Cert Fire Safety Eng. [UWS - 2003]

Grad Dip Building in Bushfire Prone Areas [UWS – 2005]

Ass Prof Cert in Expert Evidence in the Land & Environment Court [UTS – 2005]

Member - Institute of Fire Engineers

Member - Fire Protection Association Australia

13. References

Australian Building Codes Board

Building Code of Australia

Volume 1 & 2

Canprint

Australian Building Codes Board [2001]

Fire Safety Engineering Guidelines

Edition 2001

ABCB Canberra

D. Drysdale D. [1998]

Introduction to Fire Dynamics 2nd 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 for Bushfire Protection 2019

A guide for Councils, Planners, Fire Authorities and Developers

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 2006.

This document is essential reading. Download a copy from the RFS website or purchase a copy through the NSW Government online shop or phone 9228 6333.

Ramsay C & Rudolph L [2003]

Landscape and building design for bushfire prone areas

CSIRO Publishing

Standards Australia [2018]

Australian Standards 3959

Australian Building Code Board

Appendix 1: Method 2 calculations AS3929-2018



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 7/05/2021

Assessment Date: 7/05/2021

Site Street Address: 16 Amaroo Avenue, Elanora Heights
Assessor: Matthew Toghil; Bushcon Australia Pty Ltd
Local Government Area: Northern Beaches Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: T 1

Vegetation Information

Vegetation Type: North Coast WSF (Shrubby)
Vegetation Group: Wet Sclerophyll Forests (Shrubby)
Vegetation Slope: 24 Degrees Vegetation Slope Type: Downslope
Surface Fuel Load(t/ha): 22 Overall Fuel Load(t/ha): 35.98
Vegetation Height(m): 1.4 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 9 Degrees Site Slope Type: Downslope
Elevation of Receiver(m): Default APZ/Separation(m): 24.95

Fire Inputs

Veg./Flame Width(m): 100 Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95 Relative Humidity(%): 25
Heat of Combustion(kJ/kg) 18600 Ambient Temp(K): 308
Moisture Factor: 5 FDI: 100

Program Outputs

Level of Construction: BAL FZ Peak Elevation of Receiver(m): 3.42
Radiant Heat(kW/m2): 76.03 Flame Angle (degrees): 9
Flame Length(m): 94.21 Maximum View Factor: 1
Rate Of Spread (km/h): 13.83 Inner Protection Area(m): 25
Transmissivity: 1 Outer Protection Area(m): 0
Fire Intensity(kW/m): 257079

Appendix 2: Performance criteria and acceptable solutions as per Table 7 Planning for bushfire Protection 2019

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
ACCESS	<ul style="list-style-type: none">firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	<ul style="list-style-type: none">property access roads are two-wheel drive, all-weather roads.	
	<ul style="list-style-type: none">the capacity of access roads is adequate for firefighting vehicles.	<ul style="list-style-type: none">the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	
	<ul style="list-style-type: none">there is appropriate access to water supply.	<ul style="list-style-type: none">hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005;There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	
	<ul style="list-style-type: none">firefighting vehicles can access the dwelling and exit the property safely.	<ul style="list-style-type: none">at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.In circumstances where this cannot occur, the following requirements apply:<ul style="list-style-type: none">minimum 4m carriageway width;in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;property access must provide a suitable turning area in accordance with Appendix 3;curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;the minimum distance between inner and outer curves is 6m;the crossfall is not more than 10 degrees;maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; anda development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
WATER SUPPLIES	<ul style="list-style-type: none">an adequate water supply is provided for firefighting purposes.	<ul style="list-style-type: none">reticulated water is to be provided to the development, where available; anda static water supply is provided where no reticulated water is available.	
	<ul style="list-style-type: none">water supplies are located at regular intervals; andthe water supply is accessible and reliable for firefighting operations.	<ul style="list-style-type: none">fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;hydrants are not located within any road carriageway; andreticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	
	<ul style="list-style-type: none">flows and pressure are appropriate.	<ul style="list-style-type: none">fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	
	<ul style="list-style-type: none">the integrity of the water supply is maintained.	<ul style="list-style-type: none">all above-ground water service pipes external to the building are metal, including and up to any taps.where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d;a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure, 65mm Storz outlet with a ball valve is fitted to the outlet;ball valve and pipes are adequate for water flow and are metal;supply pipes from tank to ball valve have the same bore size to ensure flow volume;underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank;a hardened ground surface for truck access is supplied within 4m;above-ground tanks are manufactured from concrete or metal;raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);unobstructed access can be provided at all times;underground tanks are clearly marked;tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;all exposed water pipes external to the building are metal, including any fittings;where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; andfire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.	

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
ASSET PROTECTION ZONES	<ul style="list-style-type: none">APZs are provided commensurate with the construction of the building; andA defensible space is provided.	<ul style="list-style-type: none">an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	
	<ul style="list-style-type: none">APZs are managed and maintained to prevent the spread of a fire to the building	<ul style="list-style-type: none">APZs are managed in accordance with the requirements of Appendix 4 of PBP.	
	<ul style="list-style-type: none">the APZ is provided in perpetuity.APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	<ul style="list-style-type: none">APZs are wholly within the boundaries of the development site.APZ are located on lands with a slope less than 18 degrees.	
	<p>Home-based child care: the building must not be exposed to radiant heat levels exceeding 29kW/m² (1090K).</p>	<ul style="list-style-type: none">an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
LANDSCAPING	<ul style="list-style-type: none">landscaping is designed and managed to minimise flame contact and radiant heat to buildings; and the potential for wind-driven embers to cause ignitions.	<ul style="list-style-type: none">compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);a clear area of low-cut lawn or pavement is maintained adjacent to the house;fencing is constructed in accordance with section 7.6; andtrees and shrubs are located so that:<ul style="list-style-type: none">the branches will not overhang the roof;the tree canopy is not continuous; andany proposed windbreak is located on the elevation from which fires are likely to approach.	
	<p>Home-based child care: a bush fire emergency and evacuation management plan is prepared.</p>	<ul style="list-style-type: none">a Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: <i>A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan</i>, and the AS 3745:2010.	

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
ELECTRICITY SERVICES	<ul style="list-style-type: none">location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	<ul style="list-style-type: none">where practicable, electrical transmission lines are underground; andwhere overhead, electrical transmission lines are proposed as follows:<ul style="list-style-type: none">lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; andno part of a tree is closer to a power line than the distance set out in accordance with the specifications in <i>IS5C3 Guideline for Managing Vegetation Near Power Lines</i>.	
	<ul style="list-style-type: none">location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none">reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities; and metal piping is used;all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;connections to and from gas cylinders are metal; polymer-sheathed flexible gas supply lines are not used; andabove-ground gas service pipes are metal, including and up to any outlets.	
	<ul style="list-style-type: none">the proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	<ul style="list-style-type: none">BAL is determined in accordance with Tables A1.12.5 to A1.12.7; andconstruction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).	
	<ul style="list-style-type: none">proposed fences and gates are designed to minimise the spread of bush fire.	<ul style="list-style-type: none">fencing and gates are constructed in accordance with section 7.6.	

PERFORMANCE CRITERIA		ACCEPTABLE SOLUTIONS	
The intent may be achieved where:			
GAS SERVICES	<ul style="list-style-type: none">proposed Class 10a buildings are designed to minimise the spread of bush fire.	<ul style="list-style-type: none">Class 10a buildings are constructed in accordance with section 8.3.2.	
	<p>Home-based child care: the proposed building can withstand bush fire attack in the form of wind, localised smoke, embers and expected levels of radiant heat.</p>	<ul style="list-style-type: none">an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure; andthe existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.	

Note: the above specifications and requirements apply in relation to residential infill developments but may be used to guide the application of BPMs for 'other' developments (see Chapter 8).			
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Appendix 3: 7.5.2 NSW State Variations under G5.2(a)(i) and 3.10.5.0(c)(i) of the NCC

Certain provisions of AS 3959 are varied in NSW based on the findings of the Victorian Bush Fires Royal Commission and bush fire industry research.

The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC; clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall:

- be non-combustible; or
- comply with AS/NZS 4200.1, be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and
- clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and
- clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and
- fascias and bargeboards, in BAL-40, shall comply with:
 - clause 8.4.1(b) of AS 3959; or
 - clause 8.6.6 of AS 3959.

The interpretation of this variation is:

Enclosed subfloors: For subfloor supports there are no requirements for supporting posts, columns, stumps, stringers piers and poles for subfloor supports for BAL 12.5 and BAL 19 when the subfloor space is enclosed with a wall that complies with the determined BAL level for the site.

Unenclosed subfloors: For unenclosed subfloor supporting posts, columns, stumps, stringers piers and poles the requirements are upgraded from BAL 12.5 and BAL 19 to BAL 29 level.

Enclosed verandas: There are no requirements for supporting posts, columns, stumps, stringers piers and poles for verandas, decks, steps and landings when the subfloor space is enclosed with a wall that complies with the determined BAL level for the site.

Unenclosed verandas: The requirements for supporting posts, columns, stumps, stringers piers and poles for verandas, decks, steps, and landings are upgraded from BAL 19 and BAL 12.5 to BAL 29 level.

For unenclosed subfloors of the main building or verandas, decks, steps and landings for BAL 12.5, 19 and BAL29 supporting posts, columns, stumps, stringers piers and poles shall be:

1. A non-combustible material; or
2. A Bushfire resistant timber; or
3. A combination of 1 and 2

Acceptable timber species:

Black-butt, Turpentine, Silver Top Ash, Spotted Gum, Red Iron Bark, Kwila, Red River Gum

Sarking: To comply with the NSW State variation any sarking used for BAL 12.5 shall:

- Be Non-combustible; or
- Comply with AS/NZ 4200.1 be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS1530.2

