Bush Fire Assessment Report

Additions and Alterations

46 Yamba Street Hawks Nest

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Contents

1 Introduction

1.1 Building and Site Characteristics

This report forms part of the submission requirements to support a Development Application summarised in **Table 1.**

Table 1: Proposal summary

Property Details	46 Yamba Street Hawks Nest 2324 Lot/Section/Plan no: 18/-/DP245221 Council: MID-COAST COUNCIL	
Type of Proposal	☑ Alterations and Additions	☑ Urban
Development	EP&A: s4.14 – Infill development – Additions and Alterations including 2 carports	
Bush fire prone land status	☑ Subject Lot mapped as bushfire prone land – **Figure 1**	
Information relied upon	• Site plans (**Figure 2).** • FireMaps and ePlanning software - cadastral and topographic information and for New South Wales	

Figure 1: Bush fire prone land mapping showing subject lot captured.

1.2 Legislative requirements

The subject Lot/site is 'Bush fire prone land' as determined by local council bush fire prone land mapping under s.146 of the Environmental Planning and Assessment Act (EP&A) 1979.

The proposal is assessed in accord with Section 4.14 of the EP&A Act 1974, which details the legislative requirements for development consent for infill development on bushfire prone land. Infill development is assessed in accordance with Chapter 7 of 'Planning for Bush Fire Protection 2019' (PBP).

The National Construction Code (NCC) contains Performance Requirements and Deemed-to-Satisfy (DTS) provisions relating to the construction of buildings in bushfire prone areas, including variations in NSW, for buildings in designated bushfire prone areas. The NCC calls upon the Australian *Standard 3959 - 2018: Construction of buildings in bushfire prone areas* and the *NASH Standard: National Association of Steel-framed Housing.*

1.3 Scope

The purpose of this report is to demonstrate compliance, or otherwise, with the broad aims and objectives of *Planning for Bushfire Protection 2019 (PBP)* and *AS 3959-2018 'Construction of buildings in bushfire-prone areas.*

Based on these requirements, this report seeks to:

1. Assess the proposal with reference to PBP-2019 and AS3959-2018;
2. Identify appropriate Bush fire Protection Measures designed to mitigate the bushfire risk and protect occupants
3. Assist the Consent Authority in the determination of the suitability of the proposed development.

The recommendations contained herein may assist in forming the basis of any specific bushfire conditions that Council and/ or the NSW Rural Fire Service may elect to place within the consent conditions issued for the subject Development Application (DA).

1.4 Other known constraints

No threatened species or other known significant environmental or heritage constraints are known or have been advised.

Council as the determining authority will assess more thoroughly any potential environmental and heritage issue

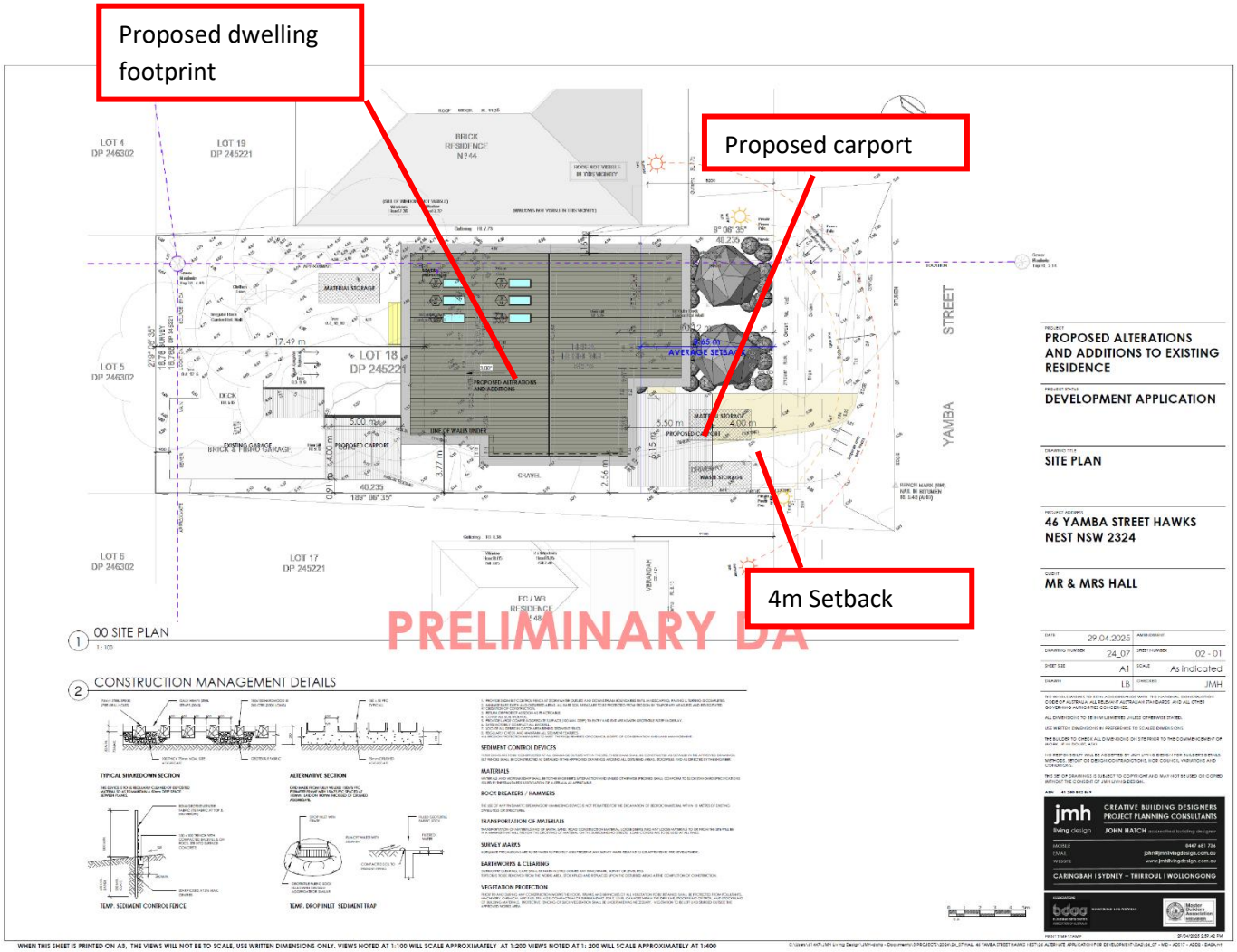

Figure 2: Site plan showing setbacks to boundary.

2 Site Assessment

The relevant Asset Protection Zone (APZ) and bushfire attack level (BAL) is determined using the methodology detailed in Appendix 1 of PBP.

2.1 Vegetation

Determine vegetation formations according to Keith (2004) in all directions around the proposed development to 140m.

Vegetation extent (bushfire hazard) within the study area is derived from Aerial photo interpretation (latest NearMap Imagery)

To the North on the opposite side of Yamba Street are areas of Dry Sclerophyll (eucalypt) vegetation, assessed as Forest under PBP.

2.2 Effective Slope

Determine the effective slope of the land from the building for a distance of 100 metres

The slope(s) that most significantly influences the bush fire behavior and has been derived from topographic 2m contour data (FireMaps – FPAA Mapping Software) and depicted in **Figure 3**

2.3 Fire weather

Determine the relevant Fire Area having a Fire Danger Index (FFDI) for the council area

The Lot is situated within MID-COAST COUNCIL having a FFDI of 80

2.4 Separation distance and Available APZ:

Determine the separation distance from the unmanaged vegetation to the closest external wall.

The separation distance in all hazard directions is shown in **Figure 3** which represents the available APZ in that direction

2.5 Bush fire attack level (BAL):

The Bush fire attack level (BAL) is used as the basis for establishing the construction requirements for development of Class 1, 2, 3 and 4 (part) buildings in NSW in bush fire prone areas.

The site assessment methodology for determining the construction requirements for bushfire prone areas is calculated using Appendix 1 of PBP 2019 which determines the appropriate BAL

Table 2: Bush fire hazard assessment

Transect	Vegetation formation	Effective Slope	Minimum APZ[1]	Separation/ Available APZ	BAL[2]	Comments
North North-East North-west	Forest	Upslope/Flat	20m	≥24m to attached Carport	**BAL-29**	The highest BAL the proposed development is exposed to is assessed as **BAL-29** Recommended the entire lot established and maintained as an IPA. Refer APZ **Section 3.1**

[1]PBP 2019 – Table A1.12.2 - Minimum distances for APZs – residential infill development, FFDI 100 areas (<29kW/m2, 1090K)

[2]PBP 2019 - Table A1.12.5 - Determination of BAL, FDI 100 – residential infill development

Figure 3: Bush fire hazard assessment

3 Bush fire protection measures

The following Bushfire Protection Measures (BPM's) are based on the development type and the assessed level of risk described in **Section 2.**

Intent of measures: to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities.

Table 3 : Summary of bushfire protection measures assessed.

Bushfire Protection Measure	Report Section	Acceptable Solution	Performance Solution
Asset Protection Zones	3.1	☑	☐
Construction standards	3.2	☑	☐
Access	3.3	☑	☐
Water supply	3.4	☑	☐
Electrical services	3.5	☑	☐
Gas services	3.6	☑	☐
Landscaping	3.7	☑	☐
Emergency Management	3.8	☑	☐

All BPMs can comply with the Acceptable Solutions under Table 7.4a of PBP for residential infill development (Sections 3.1 to 3.8)

3.1 Asset Protection Zone (APZ)

An APZ is a buffer zone between a bush fire hazard and buildings. The APZ is managed to minimise fuel loads and reduce potential radiant heat levels, flame, localised smoke and ember attack.

Table 4: Relevant APZ Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
APZs are provided commensurate with the construction of the building; and A defendable space is provided.	an APZ is provided in accordance with Table A1.12.2 in Appendix 1.	☑ Can comply. Refer Recommendations.
APZs are managed and maintained to prevent the spread of a fire to the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	☑ Can comply. Refer Recommendations.
The APZ is provided in perpetuity. APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	APZs are wholly within the boundaries of the development site. APZ are located on lands with a slope less than 18 degrees.	☑ Can comply. Refer Recommendations.

APZ Recommendations:

- At the commencement of building works and in perpetuity, the entire lot shall be managed as an Inner Protection Area (IPA) in accordance with Appendix 4 of PBP

- When establishing an IPA, the following requirements are recommended:
  - Tree canopy cover be less than 15% at maturity;
  - Trees at maturity are not touching or overhang the building;
  - Lower limbs are removed up to a height of 2m above the ground;
  - Tree canopies are separated by 2 to 5m;
  - Preference is given to smooth-barked and evergreen trees;
  - Large discontinuities or gaps in vegetation are provided to slow down or break the progress of fire towards buildings;
  - Shrubs are not located under trees;
  - Shrubs do not form more than 10% of ground cover;
  - Clumps of shrubs are separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
  - Grass to be kept mown (as a guide grass no more than 100mm in height);

3.2 Construction standards

The appropriate design and construction of buildings enhance their survivability from bush fires

Table 5: Relevant Construction Standards Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact	BAL is determined in accordance with Table A1.12.5 Construction provided in accordance with the NCC and as modified by section 7.5	☑ Can comply. Refer Recommendations.
proposed fences and gates are designed to minimise the spread of bush fire.	fencing and gates are constructed in accordance with section 7.6.	☑ Can comply. Refer Recommendations.
proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.	☑ Can comply. Refer Recommendations.

Construction Standards Recommendations:

The proposed Additions including attached carport is exposed to **BAL-29** as shown in **Table 2**.

- New construction is to comply with Section 3 (Construction General) and Section 7 **(BAL–29)** of *Australian Standard AS 3959-2018 'Construction of buildings in bushfire-prone areas* as (AS 3959 – 20018);

- In accordance with Section 7.5.2 of PBP, variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One of the NCC. The relevant clauses relate to sarking, subfloors within BAL 12.5 and BAL-19, fascia and bargeboards within BAL-40.

Proposed Carports : Where these are proposed it should be constructed in accordance with the BAL construction requirements of the main occupancy or should be separated by a minimum of 6m. The two proposed attached Carports (**Figure 2)** are required to comply with **BAL-29** as determined above for the main dwelling

Fences and Gates: All fences in bush fire prone areas should be made of either hardwood or non-combustible material. In circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

3.3 Access arrangements

Design of access roads shall enable safe access and egress for residents attempting to leave the area at the same time that emergency service personnel are arriving to undertake firefighting operations.

The subject lot is accessed from a standard driveway directly from a sealed all weather public road capable of supporting firefighting vechicles and adequate hardstand area for firefighting operations with hydrants located regularly along street frontage. Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 (reasonably assumed).

- Hydrants are located nearby on Yamba Street as shown in **Figure 3.**

PBP (Table 7.4a) states:
'There are no specific access requirements in an urban area where an unobstructed path (no great 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'

Table 6: Relevant APZ Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
The intent may be achieved where:		
firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Property access roads are two-wheel drive, all-weather roads.	☑ Can comply Refer Recommendations
there is appropriate access to water supply.	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005;	☑ Complies (reasonably assumed)

Access Recommendations:

- Property access roads (driveway) are two-wheel drive, all-weather roads.

3.4 Water supply

An adequate supply of water is essential for firefighting purposes. The water supply would enable occupants to stay and defend if chosen to and allow fire-fighting personnel to attach equipment for use.

The subject Lot is connected to reticulated water, with regular hydrants situated along street frontage. Fire hydrant spacing, design and sizing comply AS 2419.1:2005 (reasonably assumed). Hydrant flows and pressures comply with Table 2.2 of AS2419.1:2005 (reasonably assumed).

- Hydrants are located nearby on Yamba Street as shown in **Figure 3.**

Table 7: Relevant Water Supply Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
Adequate water supply is provided for firefighting purposes.	reticulated water is to be provided to the development, where available;	☑ Complies
Water supplies are located at regular intervals, accessible and reliable for firefighting operations.	fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005 and are not located within any road carriageway;	☑ Complies
Water flows and pressure are appropriate	fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	☑ Complies
Integrity of the water supply is maintained.	all above-ground water service pipes external to the building are metal, including and up to any taps	☑ Can comply Refer Recommendations

Water Supply Recommendations:

- All new above-ground water service pipes external to the building are metal, including and up to any taps.

3.5 Electricity services

The location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. Relevant Acceptable Solutions in Table 7.4a of PBP for Electricity services:

Table 8: Relevant Water Supply Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground; Where overhead, are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines.*	☑ Can comply. Refer recommendations.

Electricity Services Recommendations:

- Where practicable, new electrical transmission lines are underground;
- Where overhead, are installed with short pole spacing (30m), 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 *ISSC3 Guideline for Managing Vegetation Near Power Lines.*

3.6 Gas services

The location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

Table 9: Relevant Gas Supply Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	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; All connections to and from gas cylinders are metal (polymer sheathed flexible gas supply lines are not used) Above-ground gas service pipes are metal, including and up to any outlets.	☑ Can comply. Refer recommendations.

Gas Services Recommendations:

- 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; and
- Above-ground gas service pipes are metal, including and up to any outlets.

3.7 Landscaping

Landscaping within the APZ is designed and managed in accordance with the requirements of 'Asset protection zone standards' outlined in Appendix 4 of PBP – 2019.

Table 10: Relevant Landscaping Performance Criteria, Acceptable Solution and Compliance:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION (DTS)	COMPLIANCE
landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Compliance with the NSW RFS '*Asset protection zone standards*' Clear area of low-cut lawn or pavement is maintained adjacent to the house; Fencing is constructed in accordance with section 7.6; and Trees and shrubs are located so that branches will not overhang the roof; the tree canopy is not continuous; and any proposed windbreak is located on the elevation from which fires are likely to approach.	☑ Can comply. Refer Recommendations.

Landscaping Recommendations:

- 1m wide area suitable for pedestrian traffic provided around the curtilage of the building;
- Planting is limited in the immediate vicinity of the building;
- Planting does not provide a continuous canopy to the building (i.e. Plants are isolated)
- Landscape species are chosen to ensure tree canopy cover is less than 15% at maturity;
- Trees do no touch or overhang buildings;
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips;
- Use smooth bark trees species which generally do not spread fire up into the crown;
- Avoid planting of deciduous species that increase fuel at surface/ ground level (i.e. leaf litter); Avoid climbing species to walls and pergolas;
- Locate combustible materials such as mulch, flammable fuel stores away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such as timber garden furniture away from the building;
- Low flammability vegetation species are used.
- Fencing within 6m of a building or in areas of BAL-29 or greater are made of non-combustible material only.

3.8 Emergency Management

It is recommended that residents living in a Bush fire Prone Area are encouraged to prepare a Bush fire Survival Plan. The plan should include:

1. Triggers for leaving early in the event of a bush fire or deciding to stay if well prepared.
2. Checklists –
    a. Equipment and Protective clothing checklist
    b. Action checklist – before, during and after the fire.
3. Preparing your home to make it safer.
4. Awareness of current Bush fire Alert Levels and Fire Danger Ratings
5. Key information sites include the "Fires Near Me" smartphone app.

Emergency Management Recommendations:

- A simple Bush fire survival plan is prepared for occupants of the dwelling. This plan shall be prepared in accordance with the relevant steps detailed by the NSW Rural Fire Service *Bushfire Survival Plan.*

https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0003/36597/BFSP-Complete.pdf

4 Specific objectives for infill development:

Table 4 lists the specific objectives for Infill development from PBP and how they are satisfied.

Table 11: Specific objectives

Specific Objective	Comment
Provide a defendable space to enable unimpeded access for firefighting around all elevations of the building	• Direct access to public road system with ample space to conduct firefighting operations around the dwelling within the recommended IPA
Provide better bush fire outcome on a redevelopment site than currently exists, consummate to the scale of works proposed	• The proposal can meet all recommended Bush fire protection measures (BPM's) holistically providing a "Better bushfire outcome" than if the development did not proceed.
Design and construct buildings commensurate with the bush fire risk	• Construction works can comply with the prescribed BAL and construction recommendations.
Provide access, services and landscaping to aid firefighting operations	• The proposal can comply with the acceptable solutions under PBP for access, utilities and landscaping recommended in Section 3.
Not impose an increased bush fire management and maintenance responsibility on adjoining land owners	• The recommended APZ is contained wholly within the subject Lot or managed public land and does not rely or impose a burden on neighbouring Lots.
Increase the level of bush fire protection to existing dwellings based on the scale of the proposed work and level of potential risk	• Construction works can comply with the recommended BAL • Development will comply with the relevant recommendations for all Bush fire protection measures (BPM's)

5 Conclusions and recommendations

The proposal can meet the requirements for the specific objectives of Infill development by compliance with the acceptable or performance solutions for all BPM's within 'PBP- 2019'

Table 12: Conclusions and Recommendations

Performance Criteria	Report Section	Summary of Recommendations
APZ	4.1	• Entire subject lot shall be managed as an Inner Protection Area (IPA) in accordance with Appendix 4 of PBP
Construction standards	4.2	• New construction to comply to Section 3 (Construction General) and Section 7 **(BAL–29)** of *AS 3959-2018* including variations to AS 3959 apply in NSW under Section 7.5.2 of PBP
Access	4.3	• Property access roads (driveway) are two-wheel drive, all-weather roads.
Water supply	4.4	• All above-ground water service pipes external to the building are metal, including and up to any taps.
Electricity service	4.5	• New electrical transmission lines are underground. • Any new transmission lines and poles to be installed in compliance with ISSC3 *Guideline for Managing Vegetation Near Power Lines*.
Gas service	4.6	• Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.Above-ground gas service pipes, connections and outlets are metal. Gas cylinders kept clear of flammable materials to 10m
Landscaping	4.7	• Designed and managed in accordance with Appendix 4 of *PBP*
Emergency Management	4.8	• Bush fire survival plan is prepared for occupants of the dwelling.

Provided the development, APZ areas, Landscaping, Access and Utilities on site are constructed, designed and maintained in accordance with the recommendations described in this report, the proposed development can satisfy the aims, objectives and performance requirements of PBP 2019 considered relevant to the development under Section 4.14 of the EP&A Act 1974

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6 Disclaimer

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Limit Liability	The author is not liable to any person for damage or loss of life resulting from actions taken or not taken as recommended in this report.
Changeable guidelines	This report is based on the author's interpretation of *Planning for Bush Fire Protection 2019 (PBP)* and *Australian Standard AS 3959-2018 'Construction of buildings in bushfire-prone areas* as at the time of writing.
Conflict of interest	This report reflects the opinions and recommendations of the author only, and not those of the Rural Fire Service (RFS). Should Council or the RFS modify the recommendations or reject an assessment or proposal the author will not be held liable for any financial loss incurred as a result.
Remaining risk	Notwithstanding the recommendations made by the author, there can be no absolute guarantee that a bushfire will not occur or cause damage to property because of the extreme number of variables that bushfires present.
Measures not upheld in perpetuity	It is the responsibility of the client to maintain all bushfire protection measures proposed on an ongoing basis.

7 References

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- NSW Rural Fire Service (RFS) 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Government Publishing Service, Canberra.
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