

Bushfire Assessment Report



7 Dendrobium Crescent
Elanora Heights NSW 2101

Disclaimer:

This document has been prepared for Jenny Forder. No liability is accepted by CR Bushfire Pty Ltd with respect to its use by any other person.

This report is prepared for the benefit of the named Client only. No third party may rely upon any advice or work completed by CR Bushfire Pty Ltd in relation to the services, including this report, except to the extent expressly agreed in writing by CR Bushfire Pty Ltd.

The Client agrees that the Consultant shall have no liability in respect of any damage or loss incurred as a result of bushfire.

Table of Contents

1.	Introduction.....	5
2.	Site Description and Proposal.....	6
2.1	Site Description	6
2.2	Development Proposal.....	6
3.	Bushfire Impact Assessment.....	9
3.1	Vegetation Assessment.....	9
3.2	Slope Assessment.....	15
3.3	Category of Bushfire Attack	15
4.	Recommendations.....	16
4.1	Asset Protection Zones.....	16
4.1.1	Inner Protection Area	16
4.1.2	New Plantings	17
4.2	Construction Standards.....	17
4.3	Access	17
4.4	Water Supply, Gas and Electricity Services.....	17
4.4.1	Water	17
4.4.2	Gas and Electricity	18
5.	PBP 2019 Compliance Summary.....	19
6.	Conclusion	21
7.	References.....	22



Bushfire Assessment Certificate

This certificate provides confirmation that the development conforms to the relevant specifications and requirements of *Planning for Bush Fire Protection 2019* (PBP), pursuant to Section 4.14(1)(b) of the *Environmental, Planning and Assessment Act 1979*. It also provides a summary of the report findings for ease of reference.

Type of Development	Alterations and additions
Development Plans	Astute Architectural Drafting EH-JF-DN-1474 22-02-23
Relevant section of <i>Planning for Bush Fire Protection 2019</i> (PBP)	Section 7 'Residential Infill Development'.
Does the development rely on acceptable or performance solutions?	The development complies with the performance criteria provided within Section 7.4 of PBP 2019.
Does the proposal demonstrate compliance with the relevant specifications and requirements of PBP?	Yes
Report prepared by: Catherine Ryland, Director BPAD Level 3 No.34605	  (Recognised by the NSW RFS as a qualified consultant in bush fire risk assessment)



1. Introduction

CR Bushfire Pty Ltd has been engaged by the client to prepare a bushfire assessment report for proposed alterations and additions at 7 Dendrobium Crescent, Elanora Heights NSW 2101 (Lot 18 DP 263422).

The subject site has been identified as being mapped as bushfire prone land on the Northern Beaches Bush Fire Prone Land Map and as such the legislative requirements of *Planning for Bush Fire Protection 2019* (PBP) are applicable.

The aim of PBP is to “provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment”.

By implementing a suitable suite of bushfire protection measures as listed within this report, that meet the necessary performance criteria of asset protection zones, landscaping, access/egress, construction siting and design, and water and utility services, the vulnerability of the proposed development to bushfire should be minimised and the ability to safely defend increased.

The proposed development is an infill development as defined within PBP and as such this report has been prepared in accordance with the requirements of *Section 4.14 of the Environmental Planning and Assessment Act 1979*.

A site inspection was undertaken on the 10 June 2022 to assess the bushfire potential impacting the site. An assessment of the vegetation to a distance of 140m and the effective slope to a distance of 100m was conducted. Findings were assessed against PBP and AS3959 *Construction of buildings in bushfire prone areas*. The results are described within this report.



2. Site Description and Proposal

2.1 Site Description

The subject site is located within a rural residential area of Elanora Heights, it is zoned R5 large lot residential. There are rural residential properties to the north, south, east and west of the subject site. Elanora Country Club and golf course is situated to the east, Monash Country Club and golf course to the north and Garigal National Park to the west and south. The subject site contains one existing residential dwelling, outbuildings and a tennis court. It is accessed directly from Dendrobium Crescent via a property access driveway approximately 160 metres in length.

Bush fire prone vegetation is situated to the west and south of the subject site. A site location map is included as Figure 1 below and site details are provided in Table 1.

The methodology within *Planning for Bush Fire Protection 2019* (PBP) has been followed for site assessment and accordingly, a 140m assessment radius has been used. This is also shown in Figure 1.

Table 1: Site Description

Address	7 Dendrobium Crescent, Elanora Heights
Title	Lot 18 DP 263422
Land Use Zone	R5 Large Lot Residential (Pittwater LEP 2014)
LGA	Northern Beaches
Lot Size (approximate)	2 hectares
Bushfire Prone Land	Category 1 Vegetation and associated buffer
Forest Fire Danger Index	100

Figure 1: Site Location and 140m Survey Area

2.2 Development Proposal

The development proposal is for alterations and additions to the existing dwelling, consisting of alterations to the northern elevation of the dwelling to build a new kitchen and deck area with roof. The proposed alterations and additions are shown in Figures 2-4 below.



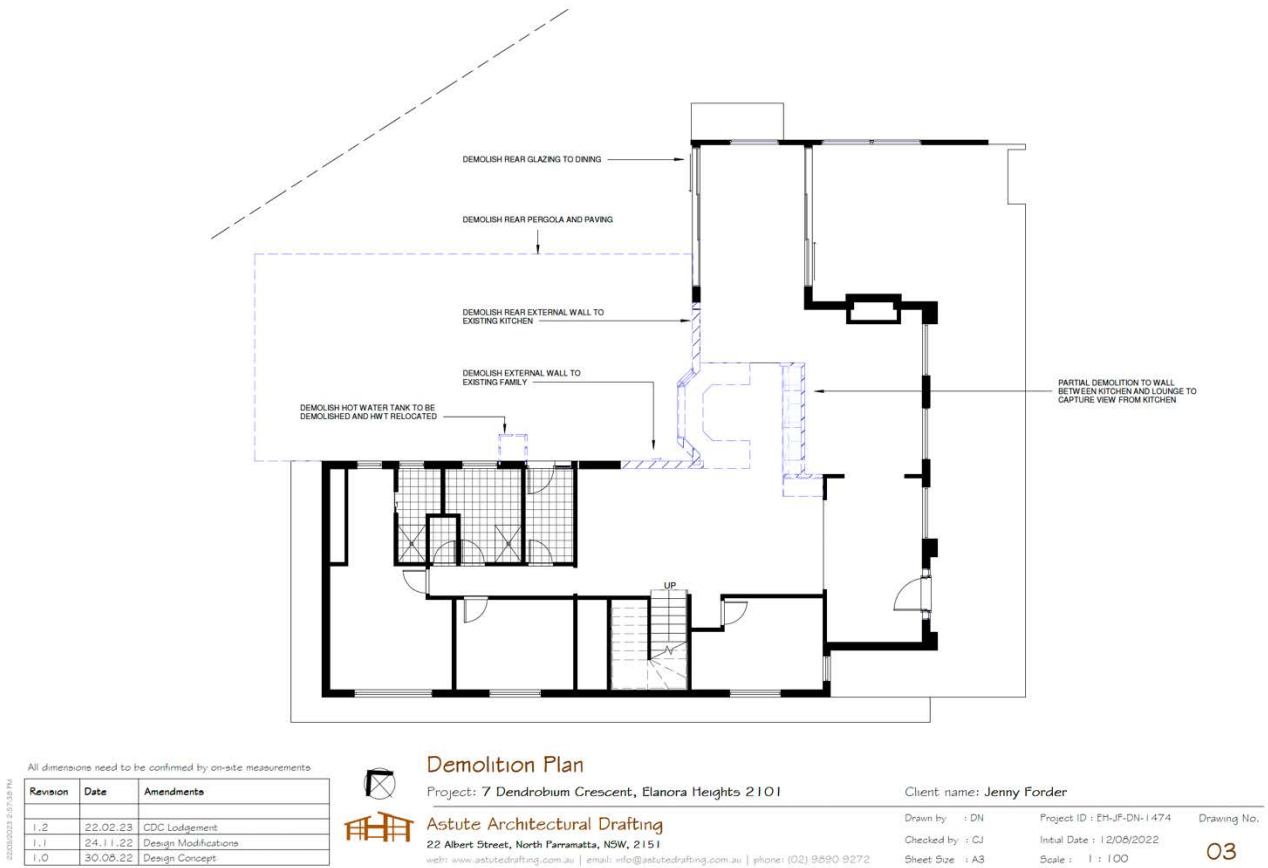


Figure 2: Proposed Demolition Plan

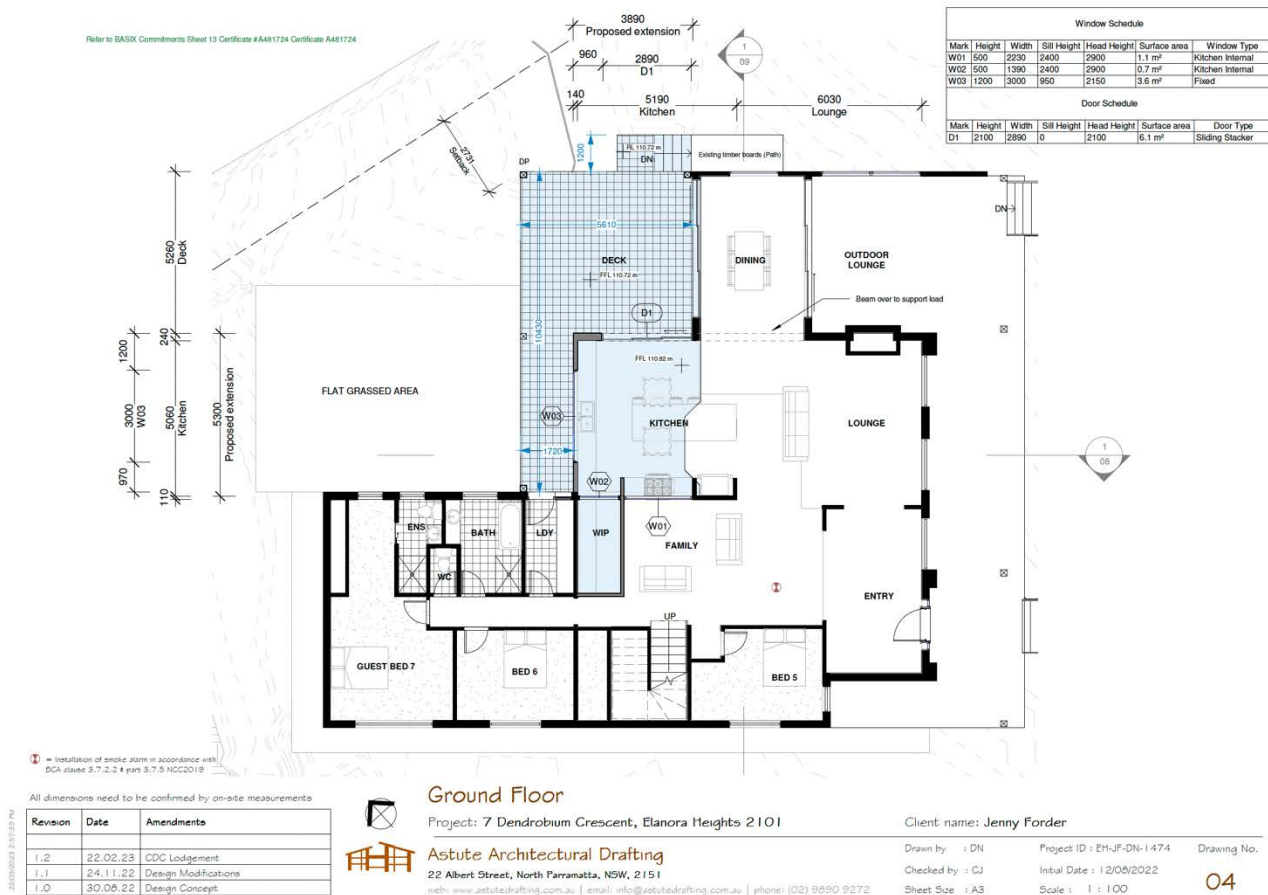
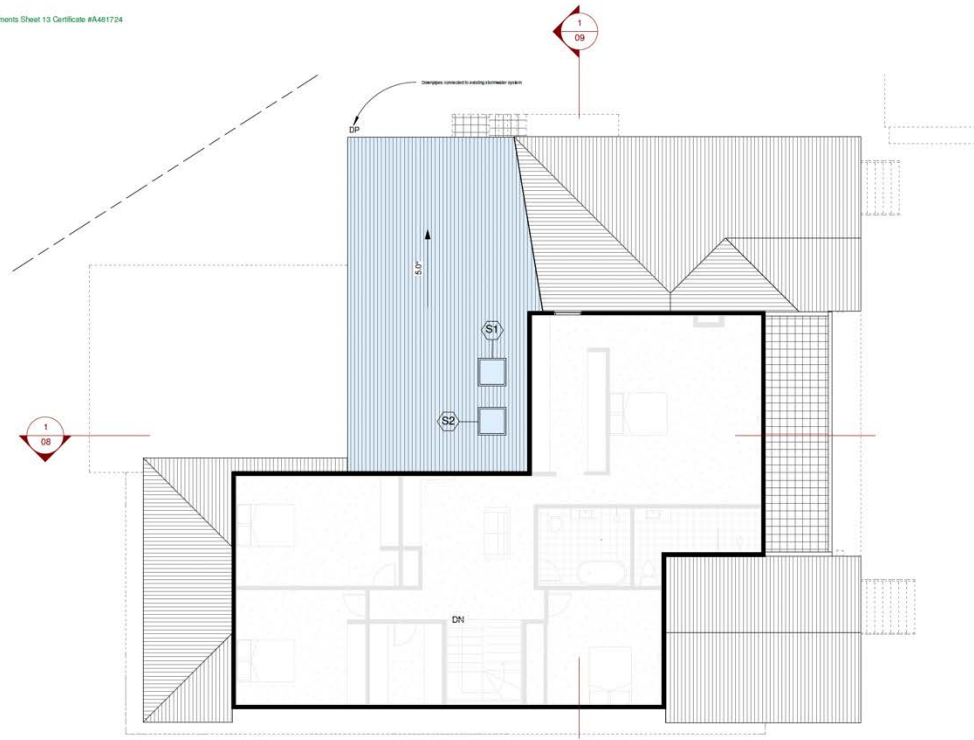


Figure 3: Proposed Ground Floor Plan



All dimensions need to be confirmed by on-site measurements

Revision	Date	Amendments
1.2	22.02.23	CDC Lodgement
1.1	24.11.22	Design Modifications
1.0	30.05.22	Design Concept



Ground Floor Roof Plan

Project: 7 Dendrobium Crescent, Elanora Heights 2101

Astute Architectural Drafting

22 Albert Street, North Parramatta, NSW, 2151

web: www.astutedrafting.com.au | email: info@astutedrafting.com.au | phone: (02) 9590 9272

Client name: **Jenny Forder**

Drawn by : DN

Checked by : CJ

Sheet Size : A3

Project ID : EH-JF-DN-1474

Initial Date : 12/05/2022

Scale : 1 : 100

Drawing No.

05

Figure 4: Proposed Ground Floor Roof Plan

3. Bushfire Impact Assessment

The bushfire impact assessment was undertaken using the site methodology outlined in Appendix 1 of *Planning for Bush Fire Protection 2019* (PBP) to determine appropriate APZs and associated construction levels.

3.1 Vegetation Assessment

The *Northern Beaches Bush Fire Prone Land Map* (2018) shows the site to be partially mapped as Category 1 vegetation and partially within the Buffer (yellow) for the Category 1 vegetation. Category 1 vegetation represents the highest level of potential combustibility and the highest likelihood of forming fully developed fires (NSW RFS *Guide for Bush Fire Prone Land Mapping*, 2015). An extract from the Bushfire Prone Land Map is provided in Figure 6 below.

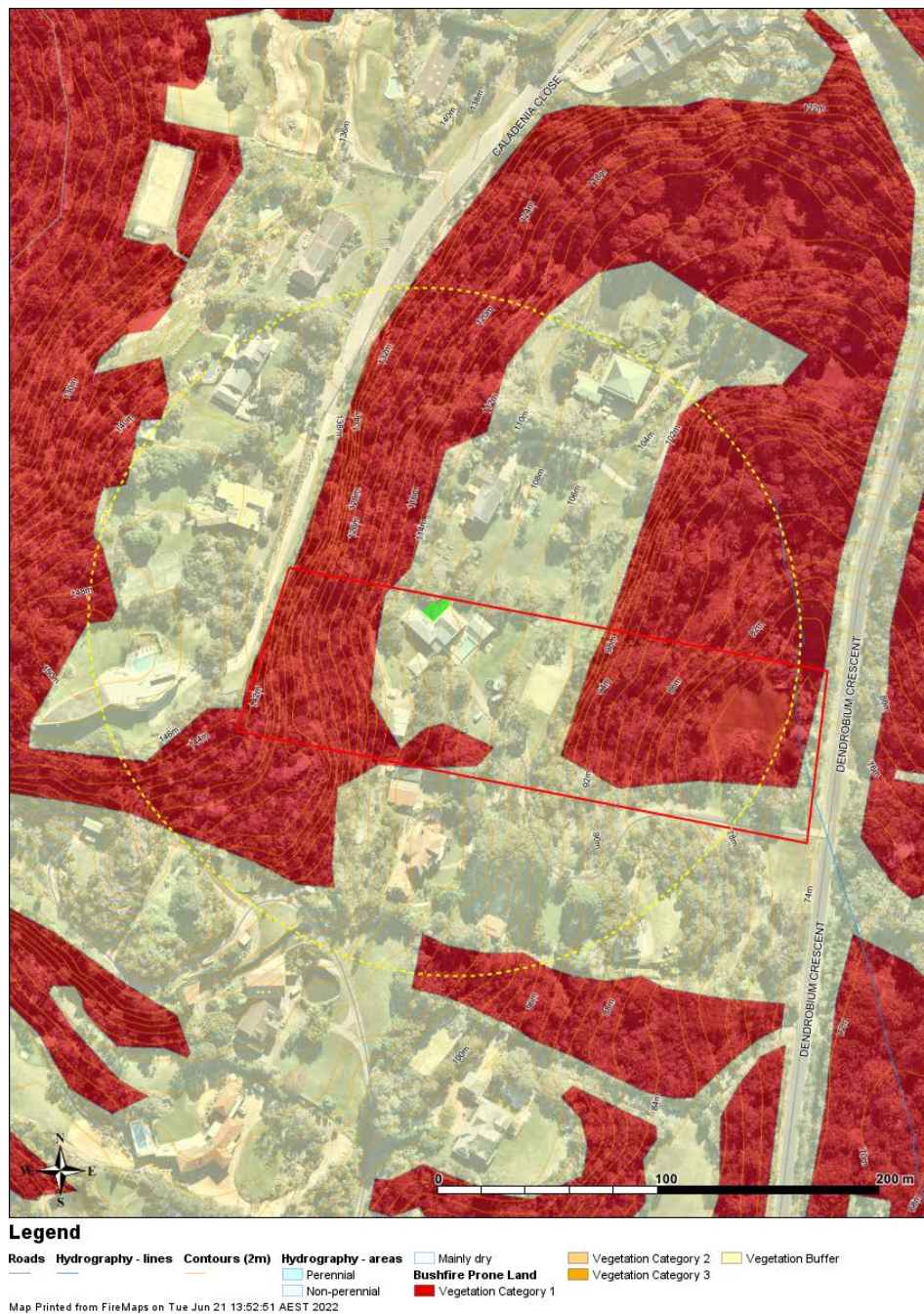


Figure 6: Extract from Bush Fire Prone Land Map

The site at 7 Dendrobium Crescent is situated within a rural residential area with bushfire prone vegetation which penetrates each of the residential lots within the area.

A site inspection on 21 June 2022 confirmed that the vegetation within the property and to the north east of the property is Sydney Coastal Dry Sclerophyll Forest. The structure of the Sydney Coastal Dry Sclerophyll Forest is described as an open eucalypt forest and woodland, 10-30m tall with a prominent and diverse sclerophyll shrub understorey and open groundcover of sclerophyll sedges. The foliage cover is 30-70% and is dominated by Scribbly Gum *Eucalyptus haemastoma* and Old Man Banksia *Banksia serrata* (Keith, D 2004).

The vegetation is mapped below and photographs are provided.



Figure 7: Vegetation map



Figure 8: Location of proposed construction



Figure 9: Access to the subject site





Figure 10: Looking northwest towards No. 5 Dendrobium Crescent



Figure 11: Looking west along the subject site





Figure 12: Vegetation to east of existing dwelling

Table 2 summarises vegetation formations and classifications identified during preliminary desktop studies and on site.

The minimum separation distance from the proposed kitchen and awning extension to unmanaged vegetation on the neighbouring property (No.5 Dendrobium Crescent) to the northwest was measured as 24 metres and to the east was measured as 70 metres. The slope under the bushfire hazardous vegetation to the west ascends 20 degrees to Caladenia Close and to the east descends 15 degrees to Dendrobium Crescent (Figure 6).





Figure 13: Vegetation and slope assessment

Table 2: Vegetation Assessment as per PBP 2019 Appendix 1

Transect	Vegetation Classes of NSW Version 3.03 (Keith and Simpson) VIS_ID 3848**	Vegetation Formation (PBP 2019)	Overall Fuel Loads DSF (surface, elevated, bark and canopy)*	Separation distance from the bushfire hazardous vegetation to the closest external wall
1 (northwest)	Sydney Coastal Dry Sclerophyll Forest	Forest	27.3 tonnes/ha	24m
2 (east)	Sydney Coastal Dry Sclerophyll Forest	Forest	27.3 tonnes/ha	70m

* Extracted from NSW RFS Comprehensive vegetation fuel loads, 2019

** Extracted from the Central Resource of Sharing and Enabling Environmental Data in NSW – The NSW Government SEED Portal

3.2 Slope Assessment

The slopes underneath the bushfire hazardous vegetation are upslope away from the property. However the slope on site is a steep fall away from the dwelling and is measured at 26 degrees downslope.

The Bush Fire Attack levels have been modelled using NBC Bushfire Attack Assessor software, the results are included at Appendix 1 and discussed within section 3.3 below.

The effective slope (that which is located under the bushfire hazardous vegetation and most likely to influence bushfire behaviour) was assessed for a distance of 100 metres. The results are summarised below in Table 3.

Table 3: Slope Assessment

Transect	Effective Slope	Direction
1 (northwest)	20 degrees	Upslope
2 (east)	15 degrees	Downslope

3.3 Category of Bushfire Attack

The Bushfire Attack Level (BAL) of the proposed development was determined using a Forest Fire Danger Index (FFDI) of 100 as per NSW Rural Fire Service document "NSW Local Government Areas FDI" (May 2017). The FFDI measures the degree of danger using a 1:50 year fire weather scenario.

The determination of the Bushfire Attack Level (BAL) is based on a worst-case scenario and a calculation derived from maximum fuel loads, rate of fire spread and anticipated radiant heat (kW/m²) at the receiver or building.

The inputs which determine this calculation are derived from Table 2 and 3 above and include the vegetation formations, effective slope and the separation distance between the bushfire hazardous vegetation and the closest external wall of the proposed development.

Table 4: Bushfire Attack Summary, FFDI 100

Transect	Vegetation Formation	Effective Slope	Minimum distance bushfire vegetation	Separation from the hazardous	Bushfire Attack Level
1 (northwest)	Forest	20 Degrees Upslope	24 metres		BAL-29
2 (east)	Forest	15 Degrees Downslope	70 metres		BAL-29



4. Recommendations

4.1 Asset Protection Zones

An Asset Protection Zone (APZ) is an area surrounding a development that provides sufficient space and is managed to reduce fuel loads to ensure radiant heat levels at buildings are kept below critical limits and prevent direct flame contact. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

An Inner Protection Area (IPA) would be required to be managed to the northern, southern property boundary and to the west for a minimum 24 metres from the existing building envelope and to the east for a minimum 45 metres from the existing building envelope. The IPA would be managed in accordance with Section 7.4 and Appendix 4 of PBP, that is:

- The APZ is provided commensurate with the construction of the new building and a defensible space is provided.
- The APZ is managed to prevent the spread of a fire to the building.
- The APZ is provided and maintained in perpetuity.
- APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimized.

It is not proposed that the area of vegetation beyond the existing fence line on site be managed as an Inner Protection Area as this would be difficult to manage given the levels on site.

4.1.1 Inner Protection Area

The IPA is designed to minimise direct flame contact and radiant heat and provide residents and emergency service personnel with a defensible space to work within.

The IPA shall have the following attributes in accordance with Appendix 4 of PBP:

- Tree canopy cover should be less than 15%, with canopies separated by 2 to 5m.
- Trees should not touch or overhang any buildings.
- Lower limbs should be removed up to a height of 2m above the ground.
- Shrubs shall be separated or planted and maintained in discontinuous clumps or garden beds.
- Shrubs shall be separated from buildings in particular windows and doors by a minimum 2 metres.
- Grass shall be kept mown (as a guide less than 100mm).
- Fallen leaves, barks, branches, and debris shall be raked up and removed from site.

In terms of the built environment within the IPA:

- Any new fences and gates shall be constructed of non-combustible material.
- Existing and proposed impervious areas such as pavements, pathways and driveways shall be kept clear of vegetation and debris in order to provide a defensible space. There shall also be no storage of flammable or combustible materials or structures within this area.



4.1.2 New Plantings

Any new plantings proposed within the IPA, shall be in line with the following landscaping measures:

- Restrict planting in the immediate vicinity of buildings.
- When considering landscape species, the size of the plant at maturity and its proximity to the dwelling and other vegetation should be considered.
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies.
- Use smooth bark species of trees which generally do not carry a fire up the bark and into the crown.
- Avoid planting of deciduous species that may increase fuel at surface/ground level,
- Avoid climbing species to walls and pergolas.
- Use low flammability species, that is species which display large glossy leaves, high moisture content, low level of volatile oils, smooth bark and no accumulation of dead leaves and stem material held within or around the plant.

4.2 Construction Standards

All new construction shall comply with Section 3 'Construction general' of AS3959-2018 *Construction of buildings in bushfire prone areas* or the NASH Standard. The following construction standards also apply:

- All new construction shall comply with Section 7 'BAL-29' of AS3959-2018 *Construction of buildings in bushfire prone areas* or the NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Area* 2014 as appropriate for BAL-29 construction.
- Gutter guards should be provided on any new roof and guttering and should be in accordance with the relevant requirements of Section 7 of AS3959-2018.
- The additional construction requirements detailed within Section 7.5.2 of PBP are applicable to the new building works.

4.3 Access

Access to the site shall be in accordance with Section 7.4 of PBP, that is it shall provide safe all-weather access for fire fighting vehicles to structures and water supply and allow for the safe evacuation of residents.

Public road access to the site is from Dendrobium Crescent, which is a sealed two-lane, all-weather road. There are no traffic management devices that prohibit access by emergency service vehicles. Maximum grades do not exceed 10 degrees with a carriageway width in excess of 5.5 metres and minimum vertical clearance of 4 metres to overhanging obstructions and tree branches. The capacity of the road is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes).

To enable firefighting operations, unobstructed pedestrian access should be provided to all elevations of the building.

4.4 Water Supply, Gas and Electricity Services

Water supply, gas and electricity shall be in accordance with Section 7.4 of PBP, that is to provide adequate water supply for firefighting purposes and to ensure gas and electricity does not contribute to the risk of fire to the building.

4.4.1 Water

The nearest access point to reticulated water (ie hydrant) is located on the footpath outside No. 5 Dendrobium Crescent, which is greater than 100m from the rear of the existing dwelling. A 20,000 litre static water supply is therefore required consistent with the requirements of PBP. As there is already an inground swimming pool, as a minimum, consideration should be given to the provision of a minimum 5hp or 3kW petrol or diesel-powered pump with fire hose capable of reaching all elevations of the dwelling



(minimum 19mm internal diameter). Alternatively, consideration should be given to an additional 20,000L static water supply tank consistent with the requirements detailed in Section 7.4 of PBP.

4.4.2 Gas and Electricity

Electricity from Dendrobium Crescent to the site is underground and as such complies with Section 7.4 of PBP. Wherever possible, new electricity connections should be provided underground and in accordance with Table 7.4a of PBP 2019.

At the time of this report, it was not known if connection to a gas supply currently exists. Any new connections to either mains or bottled gas supply should be in line with the following requirements:

- Reticulated or bottled gas is to be installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities and metal piping is to be 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 to be metal.
- Polymer-sheathed flexible gas supply lines are not used.
- Above-ground gas service pipes are metal, including and up to any outlets.



5. PBP 2019 Compliance Summary

The following table provides a summary of the proposal's compliance with PBP 2019.

Table 5: PBP 2019 Compliance Summary

Bush Fire Protection Measure	PBP 2019 Performance Criteria	Compliance with Acceptable Solutions	Compliance with specifications and requirements of PBP.
APZs	- APZs are provided commensurate with the construction of the building; and - A defensible space is provided. - APZs are managed and maintained to prevent the spread of a fire to the building. - The APZ is provided in perpetuity. - APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	- As part of the consent, a distance of 24 metres from the existing building envelope to the east, 45 metres from the existing building envelope to the west and to the northern and southern property boundary can be required to be maintained as an Inner Protection Area (IPA) in perpetuity. - The IPA will be managed in accordance with the requirements of Appendix 4 of PBP. - The IPA required to be managed within the consent for the works is wholly within the boundaries of the development site. - The IPA is located on slopes less than 18 degrees (the subject site is 15 degrees downslope). The IPA will be within an area of the site which is already largely managed. - The APZ is provided in accordance with the calculated BAL within Appendix 1 of PBP.	YES.
Access	- Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation. - The capacity of access roads is adequate for firefighting vehicles. - There is appropriate access to water supply. - Firefighting vehicles can access the dwelling and exit the property safely.	- Dendrobium Crescent is a two-wheel drive, all weather road. - The capacity of the road surface of Dendrobium Crescent and the surrounding road network is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes). There are no bridges or causeways in the immediate vicinity. - There is a hydrant which meets AS2419.1:2005. - Firefighters can gain access to the site from the driveway, allowing for an unobstructed	YES.

		path less than 70m to all elevations of the dwelling	
Water Supply	• An adequate water supply is provided for firefighting purposes. • Water supplies are located at regular intervals. • The water supply is accessible and reliable for firefighting operations. • Flows and pressures are appropriate. • The integrity of the water supply is maintained.	• Reticulated water is provided in Dendrobium Crescent, however the hydrant is located over 100m from the rear of the dwelling. • A static water supply of 20,000 litres is recommended, with appropriate fittings and connections to enable firefighting.	YES
Electricity and Gas	• Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. • Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• The existing electricity supply is underground and compliant. • Any proposed gas and electricity supply will need to be compliant with PBP and underground wherever possible.	YES
Construction Standards	• The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact. • Proposed fences and gates are designed to minimise the spread of bush fire. • Proposed Class 10a buildings are designed to minimise the spread of bush fire.	• New construction shall comply with Section 3 of AS3959-2018 or the NASH Standard. • New construction shall comply with Section 7 'BAL-29' of AS3959-2018 or the NASH Standard. • All new construction will also comply with the 'Additional Construction Requirements' detailed within Section 7.5 of PBP.	YES
Landscaping	• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	• The property can be managed as an Inner Protection Area as per "APZs" above, in accordance with Appendix 4 of PBP. • Any new planting within the IPA will be in accordance with PBP 2019.	YES



6. Conclusion

The proposal meets the specifications and requirements of PBP pursuant to S4.14 of the *Environmental Planning and Assessment Act 1979*. The proposed level of bushfire protection is appropriate for the bushfire risk setting and provides a vastly improved bushfire outcome over and above the existing situation. That is true even when the increase in people numbers on the site is considered.

The proposal complies with Section 7 of PBP 2019, Section 8 of PBP 2019 and the overall Aim and Objectives of PBP 2019.

As such, there is no objection to the development occurring providing the following development consent conditions can be applied:

- At the commencement of construction and in perpetuity the property will be managed as an IPA to a distance of 24 metres from the existing building envelope to the east, 45 metres from the existing building envelope to the west and to the northern and southern property boundary in perpetuity as detailed within Section 4.1 of this report.
- New construction shall comply with Section 3 'Construction general' of AS3959-2018 *Construction of buildings in bushfire prone areas* or the NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Area 2014*.
- New construction shall comply with Section 7 'BAL-29' of AS3959-2018 *Construction of buildings in bushfire prone areas* or the NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Area 2014* as appropriate for BAL-29 construction.
- Gutter guards should be provided on any new roofing and should be in accordance with the relevant requirements of Section 7 of AS3959-2018.
- The additional construction requirements detailed within Section 7.5.2 of PBP are applicable to the new building works.
- Unrestricted pedestrian access shall be provided around all elevations of the dwelling.
- Water supply shall be in accordance with Section 4.4.1 of this report.
- Gas and Electricity services shall be installed and maintained in accordance with Section 4.4.2 of this report.

It is recommended that the residents complete a Bushfire Survival Plan. A copy of which can be downloaded from the Rural Fire Service website (<https://www.rfs.nsw.gov.au>).



7. References

Australian Building Codes Board (2005) *National Construction Code Volume 2*.

ISSC3 *Guide for the Management of Vegetation in the Vicinity lines of Electricity Assets*. 2016.

Keith D (2004) *Ocean Shores to Desert Dunes*, Department of Environment and Conservations Sydney.

NSW Government Planning Portal, *Eplanning Spatial Viewer*
<https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

NSW Rural Fire Service (2019) *Comprehensive vegetation fuel loads*, NSW Rural Fire Service.

NSW Government, *ePlanning Spatial Viewer*,
<https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

Planning NSW in conjunction with NSW Rural Fire Service (2019) *Planning for Bush Fire Protection*. NSW Rural Fire Service.

Standards Australia and Australian Building Codes Board (2018) *AS 3959 Construction of buildings in bushfire prone areas*.

The Central Resource of Sharing and Enabling Environmental Data in NSW – NSW Government SEED Portal
https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU