



# Bushfire Hazard Assessment

13 Cumberland Avenue Collaroy 2097 (Lot 19/1/DP10649).



## Project Details

Assessed as:	Infill Development.
Assessed by	Matthew Noone (BPAD Accreditation No. BPAD-PD 25584)
Highest BAL on any facade	BAL-12.5
Planning for Bushfire Protection (2019) Compliance	The development conforms to the relevant specification and requirements of Planning for Bushfire Protection in accordance with Section 4.14 of the Environmental Planning and Assessment Act 1979.
Project Description	Proposed Alterations and Additions and Approval for Existing Granny Flat.
Report Number	BR-355321-A
Date	31/05/2021

31/05/2021



# BUSHFIRE RISK ASSESSMENT CERTIFICATION

Development Address	13 Cumberland Avenue Collaroy 2097.
Parcel number	(Lot 19/1/DP10649).
Development description	Proposed Alterations and Additions & Approval for Existing Granny Flat.
Drawings Reviewed.	Attached to report BR-355321.
Assessed Bushfire Attack Level	BAL-12.5
Does the assessment rely on alternate solutions?	No.
Assessed by Matthew Noone BPAD Accreditation Scheme No.	FPAA No. BPAD-PD 25584
Certificate Number:	BR-355321-A

I hereby certify, in accordance with s.4.14 of the Environmental Planning and Assessment Act 1979 that;

1	I am a person recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment; and
2	Subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements*

\* The relevant specifications and requirements being; specifications and requirements of the document entitled Planning for Bush Fire Protection prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by s.4.14 of the Environmental Planning and Assessment Act 1979.

I am aware that the Bushfire Assessment Report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with Planning for Bushfire Protection (2019).

The following have been provided and or included in our assessment.

- ☒ - Bushfire Risk Assessment Report.
- ☒ - Recommendations.
- Statement of vegetation impact in relation to APZ.

## CONTROLLED DOCUMENT DISTRIBUTION AND REVISION REGISTER

ISSUED TO	DATE	REVISION	ISSUED BY
Corona Projects	31/05/2021	A	Matthew Noone

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AS3959 (2018) states *"It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature of behaviour of fire, and extreme weather conditions."*

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This report has been prepared by Matthew Noone trading as Bushfire Planning and Design. Matthew Noone holds a BPAD Level 2 accreditation with the Fire Protection Association of Australia. Under the BPAD accreditation scheme a BPAD Level 2 consultant can provide advice and undertake all types assessments with the exception of alternate solutions. In the event that alternate solution is proposed it will be undertaken outside of our accreditation. Alternate solutions are considered a deviation from the prescribed standards and as per s.4.14 of the Environmental Planning and Assessment Act (1979) are required to be required to be referred to the New South Wales Rural Fire Service (RFS) for review.

This report has been based on our interpretation of Planning for Bushfire Protection (2019), AS3959 (2018) and the methodology for site specific bushfire assessment. As a consultant, our view can be subjective. Our opinions may differ from the opinions provided by you the Client (or Client Representative), the Council, the RFS or another bushfire consultant. The Rural Fire Service (RFS) have a higher authority and can upon their review, increase a nominated BAL-rating or entirely reject a development proposal. Any such recommendations made by the RFS take precedence. Our role is intermediary between our Client (or Client Representative) and the consenting authority. We apply our knowledge of the relevant bushfire protection standards to provide the best possible outcome for our Client (or Client Representative), both from a bushfire safety and financial perspective. Should the RFS modify our recommendations or reject the proposal to which this report relates to we will not be held liable for any financial losses as a result. By using this document, you (the Client Representative) agree to and acknowledge the above statements.

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## SECTION 1. BACKGROUND AND BRIEFING NOTES

### 1.1 INTRODUCTION

The subject site whether in whole or part is recorded as bushfire affected on a relevant map certified under Section 10.3 (2) of the Environmental Planning and Assessment Act 1979 (Refer figure 1.1). The development relates to the development of bushfire prone land and therefore must address the legislative requirements stipulated in Section 4.14 of the Environmental Planning and Assessment Act 1979. The development is required to comply with the New South Wales Rural Fire Service document Planning for Bushfire Protection (2019).



Figure 1.1: Bushfire Prone Land Map (NSW Planning Portal (2021) found at <https://www.planningportal.nsw.gov.au>) accessed 31/05/2021.

## 1.2 DEVELOPMENT PROPOSAL

The development relates to the undertaking of alterations and additions to the existing dwelling.

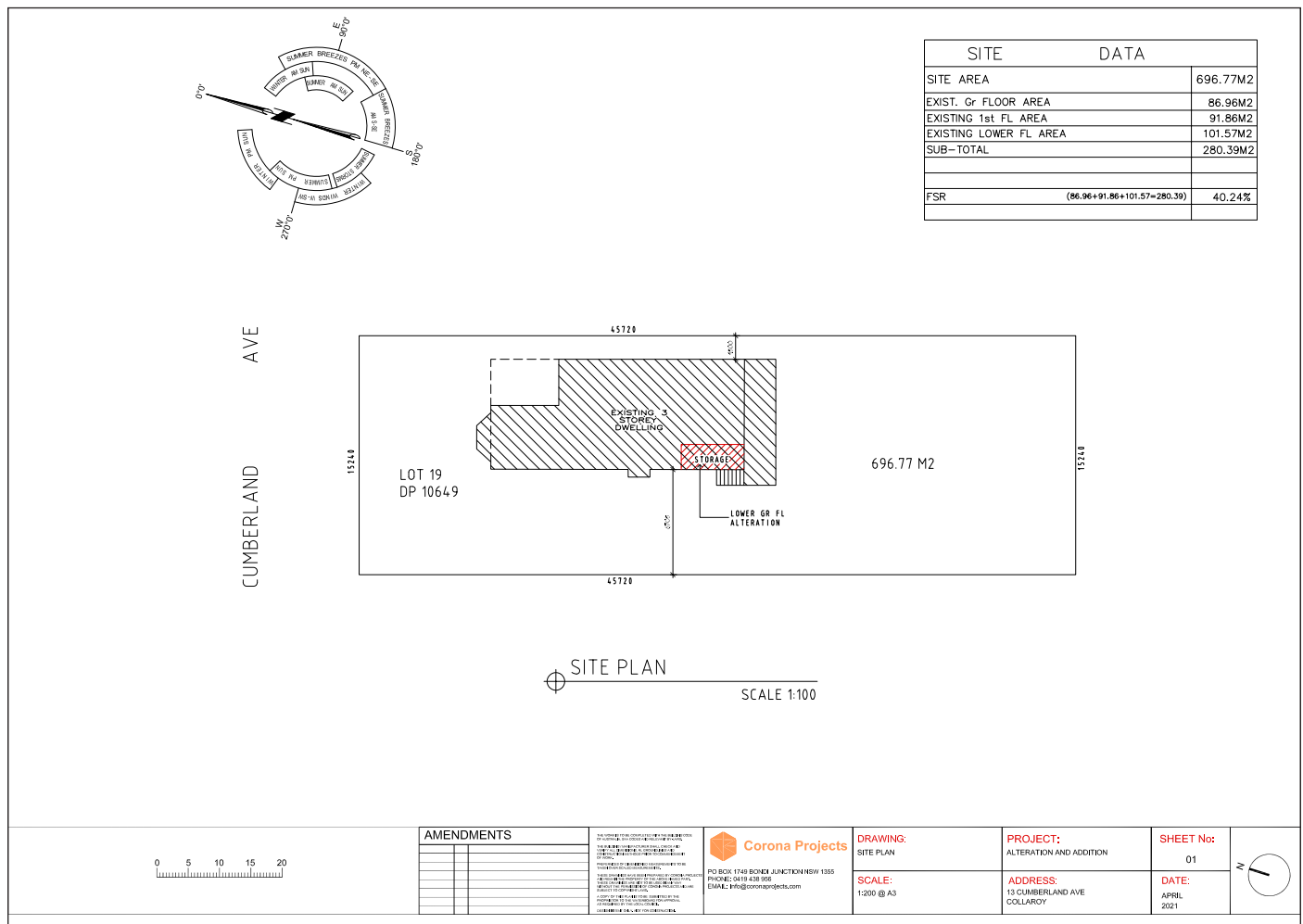


Figure 1.2: Architectural Site Plan.

## 1.3 PURPOSE OF THIS REPORT

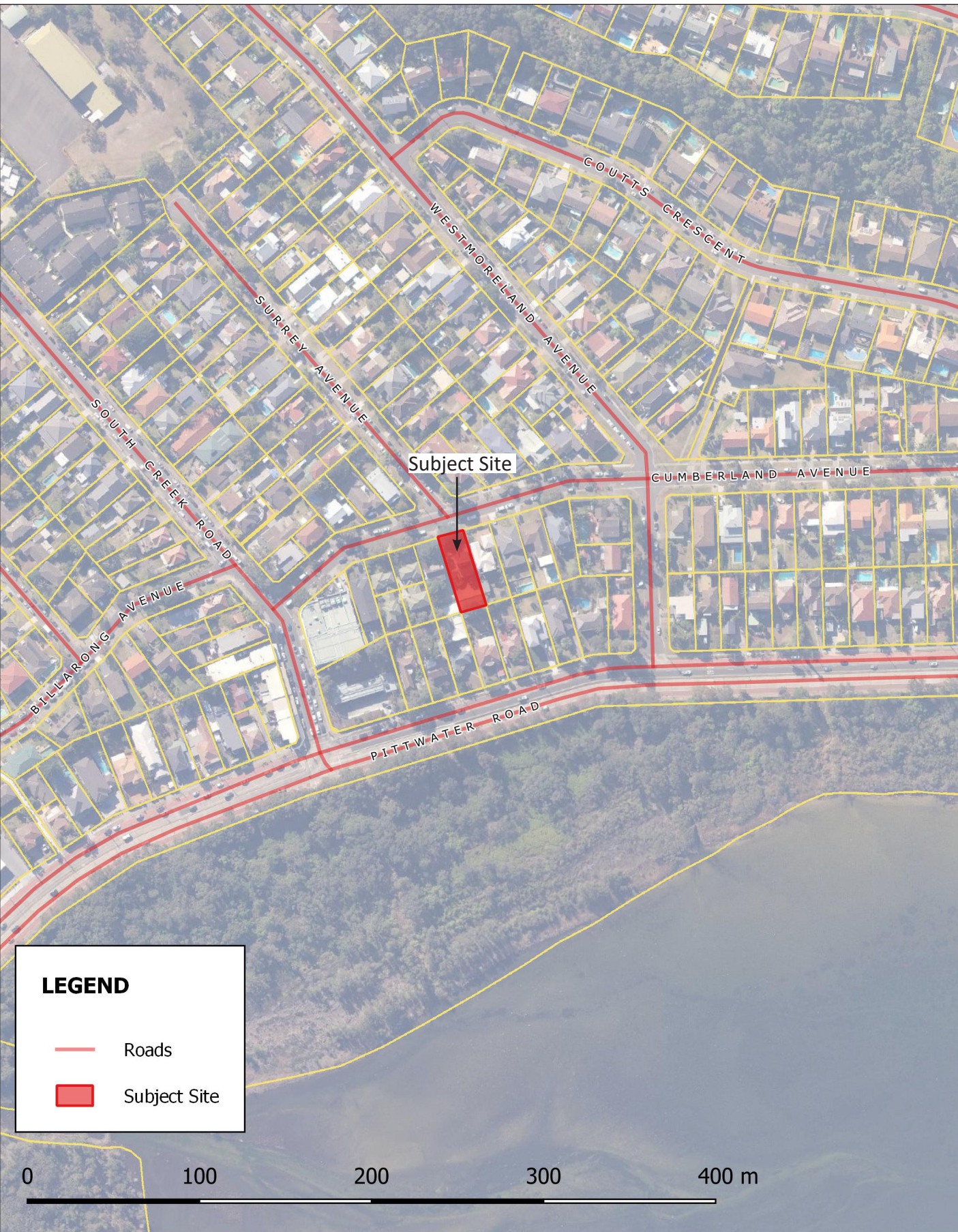
Development applications on bush fire prone land must be accompanied with a Bush Fire Assessment demonstrating the degree to which the proposed development complies with or deviates from the aims, objectives and performance criteria of Planning for Bushfire Protection (PBP 2019). For the purpose of this report it is necessary to describe the surrounding vegetation to 140m from the boundary and slope to 100m from the proposed development. This report does not directly assess the bushfire hazard on any adjacent site and cannot be used to support any development on an adjoining allotment. The purpose of this report is to address the following;

- To provide the land owner, Northern Beaches Council, the RFS and other relevant stakeholders with a bushfire report that determines the bushfire hazard for the proposed development.
- To identify compliance with the specific objectives and performance requirements of Planning for Bushfire Protection (2019).
- To determine the required level of construction required by AS3959 – Australian Standard for the Construction of Buildings in Bushfire Prone Areas.
- Provide bushfire protection recommendations to mitigate the adverse affects from bushfire. The recommendations provided are based on the acceptable solutions stated in PBP (2019).



1.4 SITE LOCATION AND DESCRIPTION

The subject site is located in a residential area in Collaroy which is within the Northern Beaches Local Government Area (LGA). An existing dwelling is located on the site. The land to the north, east and west is managed land for 100m. Forested Wetland is located to the south of the subject site.





## 1.5 LAND USE, ZONING AND PERMISSIBILITY

The subject site is zoned R2 Low Density Residential.

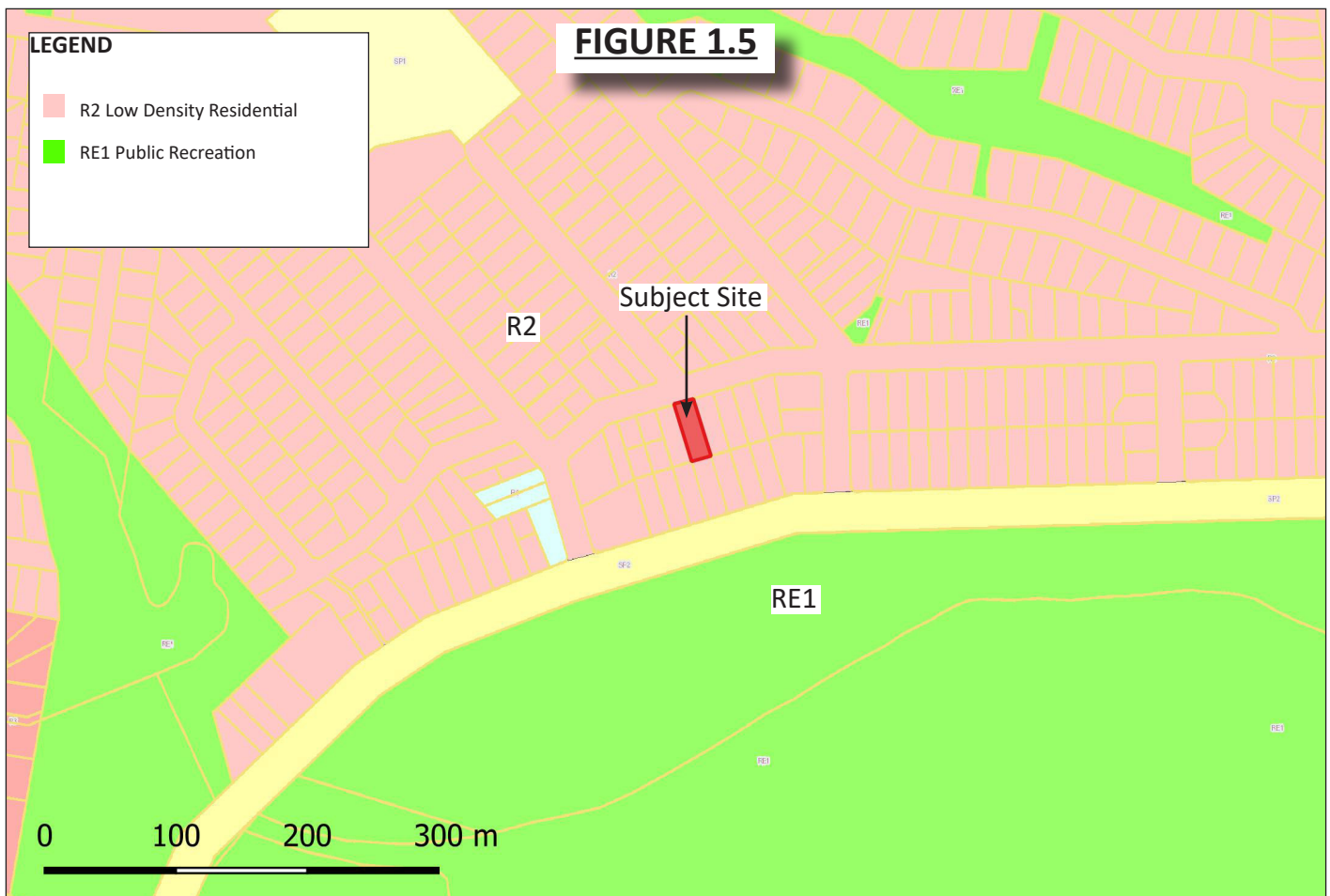


Figure 1.5: Land Zoning Map.

## 1.6 REGULATORY FRAMEWORK

The main legislation, planning instruments, development controls and guidelines that are related to this project are as follows;

### 4.14 Consultation and development consent— certain bush fire prone land

*(1) Development consent cannot be granted for the carrying out of development for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bush fire prone land unless the consent authority:*

*(a) is satisfied that the development conforms to the specifications and requirements of the document entitled Planning for Bush Fire Protection, prepared by the NSW Rural Fire Service in co-operation with the Department of Planning (or, if another document is prescribed by the regulations for the purposes of this paragraph, that document) that are relevant to the development (“the relevant specifications and requirements”), or*

*(b) 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. (EPA & A, 1979).*



## SECTION 2. BUSHFIRE ATTACK LEVEL (BAL) PARAMETERS

### 2.0 INTRODUCTION

For the purpose of this bushfire assessment, the vegetation is required to be described to a distance of 140m from the boundary and the slope to 100m from boundary. Vegetation type and slope under vegetation are the factors that will significantly affect bushfire behaviour.

‘Research has shown that 85% of houses are lost in the first 100m from bushland and that ember attack is a significant form of attack on properties’ (RFS 2006).

### 2.1 SLOPE

The effective slope has been assessed for a distance of at least 100m from the proposed development. The slope data has been calculated from a 1m LiDAR Digital Elevation Model (DEM). The source data sets have been captured to standards that are generally consistent with the Australian ICSM LiDAR Acquisition Specifications with require a fundamental vertical accuracy of at least 0.30m (95% confidence) and horizontal accuracy of at least 0.80m (95% confidence). The slope arrows indicated in figure A represent the slope calculated across the length of the arrow direct from the digital elevation model. The calculated slope as shown in figure A has not been manipulated or modified in any way.

### 2.2 PREDOMINANT VEGETATION CLASS

This assessment includes vegetation both within and external to the site boundaries. Where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard shall be used for the purpose of assessment. The combination of vegetation and slope that yields the worst case scenario shall be used (A1.2 PBP 2019).

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Photo 1: Forested Wetland south of Pittwater Road.



Photo 2: Forested Wetland south of Pittwater Road.



<b>TABLE 1 - BAL ASSESSMENT (To be read in conjunction with Figure A).</b>						
LGA = Northern Beaches Council				Forest Fire Danger Index = FDI 100		
<b>ASPECT <sup>1</sup></b>	<b>Vegetation Class <sup>2</sup></b>	<b>Max Effective Slope <sup>3</sup></b>	<b>Site slope <sup>3</sup></b>	<b>Required APZ <sup>4</sup></b>	<b>Proposed APZ / EML <sup>5</sup></b>	<b>BAL-Rating</b>
S	Forested Wetland	0-5° D-S	N/A	26-100m	> 75m	BAL-12.5
AOD	Managed residential land					BAL-12.5

<b>Abbreviations</b>		
AOD All other directions	EML Extent of managed land	NVC Narrow vegetation corridor

<sup>1</sup>	Cardinal direction from each proposed building facade based on grid north.
<sup>2</sup>	Vegetation Classifications are as described in PBP (2019) A1.2.
<sup>3</sup>	Site slope is calculated from 1m LiDAR contours.
<sup>4</sup>	Minimum APZ required stated as Acceptable Solutions within Table 1.12.2 and A1.12.5. PBP (2019).
<sup>5</sup>	Actual dimensional setback from the face of the building to the assessed vegetation. Achieved Asset Protection Zone (APZ) or extent of managed land (EML).
<sup>6</sup>	Where the direct line of sight between the proposed building and assessed vegetation is obstructed (by a wall or building) the assessed rating can be lowered by one BAL-rating (PBP 2019, s. A1.8).
<sup>7</sup>	Remnant bushland and narrow vegetation corridors (NVC) as stated in PBP (2019) s.A1.11 can be assessed as rainforest as a simplified approach or be assessed as Short Fire Run using method 2 (AS3959).
<sup>8</sup>	Deeming provisions for grassland s.7.9 PBP (2019).
<sup>9</sup>	BAL-rating determined via method 2 (AS3959)

## 2.3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT.

To clarify the findings above, forested wetland is located greater than 75m to the south and south east of the subject site. The land in all other directions is managed residential land for 100m from the site boundary.

Based on the parameters identified in table 1 above and as depicted in Figure A, the subject site is assessed as BAL-12.5 as specified in AS3959 (2018).

## 2.4 RECOMMENDED ASSET PROTECTION ZONES (APZs).

No specific Asset Protection Zone (APZ) required. The subject site is surrounded by managed residential land. The inherent management of the subject site and surrounding allotments is sufficient to achieve the nominated BAL-ratings and defensible space. The site is to be managed as an inner APZ for perpetuity. No vegetation is required to be removed for the purpose of managing an APZ.

Refer to Section 3 for recommendations relating to APZ provision.





### SECTION 3. ASSET PROTECTION ZONE (APZ) RECOMMENDATIONS

#### PERFORMANCE CRITERIA (PBP 2019)

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

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

The asset protection zones (APZ) requirements have been derived from the methodology of A1.12.2 or A1.12.3 in Appendix 1 of PBP (2019). Asset protection zones and in particular the Inner Asset Protection Zones are critical for providing defensible space and reducing flame length and rate of spread (PBP 2019). APZs are designed to provide sufficient open space for emergency workers to operate and for occupants to egress the site safely. They are divided into Inner and Outer Asset Protection Zones (IPAs and OPAs) and are required to be maintained for the life of the development. The IPA provides for defensible space and a reduction of radiant heat levels at the building line and the OPA provides for the reduction of the rate of spread and filtering of embers.

#### GENERAL RECOMMENDATIONS

- The APZ should be located completely within the boundary of the site. The required APZ will often be satisfied by surrounding managed land.
- The APZ should not be located on slopes greater than 18° unless terracing is introduced.
- The APZ is to be managed in accordance with Appendix 4 (PBP 2019).
- Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions
- A clear area of low-cut lawn or pavement is maintained adjacent to the house;.
- 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.

## INNER APZ (IPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2019).

The Inner APZ (IPA) is the managed area closest to the asset (eg. dwelling). The IPA is managed to minimal fuel conditions and aims to mitigate the impact of direct flame contact and radiant heat on the development. The IPA also aims to provide defensible space.

### TREES

- Canopy cover should be less than 15% (at maturity) within the Inner APZ.
- Trees (at maturity) should not touch or overhang the building.
- Lower limbs should be removed up to a height of 2m above ground.
- Canopies should be separated by 2 to 5m.
- Preference should be given to smooth barked and evergreen trees.

### SHRUBS

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings.
- Shrubs should not be located under trees shrubs should not form more than 10% ground cover.
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

### GRASS

- Should be kept mown (as a guide grass should be kept to no more than 100mm in height).
- Leaves and vegetation debris should be removed.

## OUTER APZ (OPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2019).

The Outer APZ (OPA) is the part of the APZ that is located between the IPA and the bushfire vegetation threat.

The reduction in the available fuels and canopy connections in the OPA aims to mitigate the intensity of an approaching fire and restricts the pathways to crown fuels thus reducing the level of direct flame, radiant heat and ember attack on the IPA and asset (dwelling).

### TREES

- Canopy cover should be less than 30% (at maturity) within the Outer APZ.
- Trees should have canopy separation canopies should be separated by 2 to 5m.

### SHRUBS

- Shrubs should not form a continuous canopy.
- Shrubs should form no more than 20% of ground cover.



## SECTION 4. CONSTRUCTION RECOMMENDATIONS

PERFORMANCE CRITERIA (PBP 2019)	ACCEPTABLE SOLUTION
<p>It must be demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The BAL construction requirements have been determined in accordance with the appropriate table from A1.12.2 to A1.12.7 (PBP 2019) and in accordance with the NCC and as modified by section 7.5.</p> <p>The building requirements for the specified BAL-rating will mitigate bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The proposed alteration is to be constructed to BAL-12.5 as indicated in Figure A and as specified in AS3959 (2018). This includes the general requirements of Section 3 of AS3959 (2018) and the additional construction requirements stipulated in s.7.5 of the New South Wales Rural Fire Service (RFS) document Planning for Bushfire Protection (PBP 2019). The existing granny flat is to be upgraded to comply with BAL-12.5 as specified in AS3959.</p> <p>It is the building contractor's responsibility to source a copy of the relevant AS3959 (2018) standard to ensure the proposed development is constructed to the correct BAL-rating specifications.</p>	

•	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.
•	There are no bush fire protection requirements for Class 10a buildings located more than 6m from a dwelling in bush fire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the NCC.

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## SECTION 5. ACCESS REQUIREMENTS

### PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.

- Fire-fighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.
- The capacity of access roads is adequate for fire-fighting vehicles.
- There is appropriate access to water supply.
- Fire-fighting vehicles can access the dwelling and exit the property safely.

### PUBLIC ROADS - SPECIFIC REQUIREMENTS

Cumberland Avenue is sealed public road. The public road system is deemed to be adequate for emergency services appliances. Figure 5.1 shows the road systems in the area.

### PROPERTY ACCESS - SPECIFIC REQUIREMENTS

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 fire fighting vehicles

### ADDITIONAL COMMENTS IN RELATION TO ACCESS

### ACCEPTABLE SOLUTION

The proposed development can comply with the intent of PBP (2019) with regards to site access requirements.

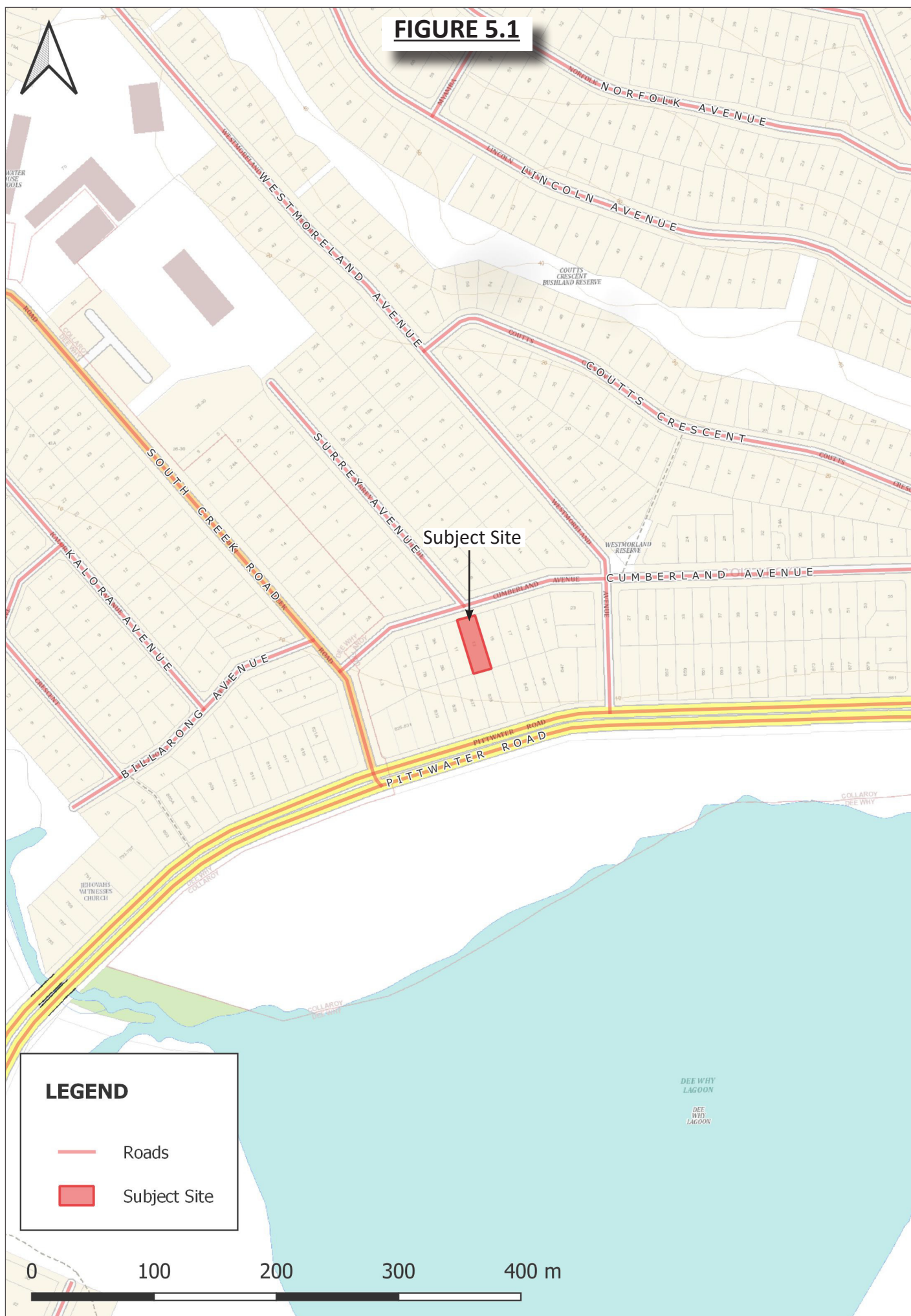


Figure 5.1: Roads and Fire Trails in the vicinity of the site.



## SECTION 6. SERVICES REQUIREMENTS - WATER

### PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: To provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

- An adequate water supply is to be provided for fire-fighting purposes.
- Water supplies are to be located at regular intervals.
- The water supply is to be accessible and reliable for fire-fighting operations.
- Flows and pressure are to be appropriate
- The integrity of the water supply is to be maintained.
- A static water supply is to be provided for fire-fighting purposes in areas where reticulated water is not available.

### WATER - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2019) with regards to water requirements. Reticulated water is provided however the hydrant sizing, spacing or pressures have not been tested. No additional water for the suppression of bushfire is required for the proposed development.

The following points are to be adhered to for the life of the development.

- All above-ground water service pipes (including taps and connections) external to the building are to be metal.

### ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF WATER

### ACCEPTABLE SOLUTION

No new water services proposed. The proposed development can comply with PBP (2019) if required.

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## SECTION 7. SERVICES REQUIREMENTS - ELECTRICITY & GAS

### PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

- Location of electricity services is to limit the possibility of ignition of surrounding bush land or the fabric of buildings.
- Location and design of gas services is not to not lead to the ignition of surrounding bushland or the fabric of buildings.

### ELECTRICITY AND GAS - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2019) with regards to electricity and gas requirements. The following points are to be adhered to (where applicable) for the provision of electricity and gas services where applicable.

#### ELECTRICITY REQUIREMENTS

- Where practicable place electrical transmission lines are underground or,
- If 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).
- No part of a tree is to be closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.

#### GAS REQUIREMENTS

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

#### ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF ELECTRICITY AND GAS.

#### ACCEPTABLE SOLUTION

The proposed development can comply with PBP (2019) with regard to the provision of gas and electricity.

## SECTION 8. DEVELOPMENT RECOMMENDATIONS

The following points are recommended for inclusion in the DA conditions of consent;

1.	Construction	Upgrade the granny flat to comply with BAL-12.5 (Section 2 and 4).
		Provide metal fly screens over the openable windows.
		Provide draught excluders for all hinged doors.
2.	APZs	Nominated APZs to be managed as an inner APZ for perpetuity (Section 3).
3.	Access	None.
4.	Services	Comply with the services provisions noted in Section 6 and 7 (where applicable).
5.	In the event that Council or the NSW Rural Fire Service modifies our recommendations then this report should no longer be referred to. The bushfire requirements as stated in the DA Consent conditions will take precedence.	
6.	We strongly recommend that the applicant cross references the bushfire requirements within the DA consent conditions and our report and alert us to any discrepancies.	

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## SECTION 9. CONCLUSION

The development relates to the undertaking of alterations and additions to the existing dwelling.

The development is captured under Section 4.14 of the Environmental Planning and Assessment Act 1979; Consultation and development consent – certain bush fire prone land. For the purpose of bushfire assessment the development is considered infill development as described in the New South Wales Rural Fire Service document Planning for Bushfire Protection (2019).

The subject site is located in a residential area in Collaroy which is within the Northern Beaches Local Government Area (LGA). An existing dwelling is located on the site. The land to the north, east and west is managed land for 100m. Forested Wetland is located to the south of the subject site.

No specific Asset Protection Zone (APZ) required. The subject site is surrounded by managed residential land. The inherent management of the subject site and surrounding allotments is sufficient to achieve the nominated BAL-ratings and defensible space. The site is to be managed as an inner APZ for perpetuity. No vegetation is required to be removed for the purpose of managing an APZ.

The proposed alterations and existing granny flat are assessed as BAL-12.5 as indicated in Figure A and as specified in AS3959 (2018) the Australian Standard for the Construction of Buildings in a Bushfire Prone Area. The existing granny flat is to be upgraded to comply with BAL-12.5 ember protection.

The project can comply with the construction requirements of AS3959 (2018) and the performance requirements of the BCA. The objectives and performance requirements of PBP (2019) are also achieved.

Site access, including access via the public road system is suitable for emergency response vehicles. The development complies with PBP (2019) with regards to the provision of water. The requirements for electricity and gas can also be complied with.

Should Council or the NSW Rural Fire Service have any objection to any part of this report, please provide the professional courtesy to get in contact to discuss.

Regards,



Matthew Noone

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BSc (Geology)

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T/A Bushfire Planning and Design



## SECTION 10. REFERENCES

AS3959 (2018)	Australian Standard, Construction of buildings in bushfire-prone areas, AS 3959, Third edition 2018 Standards Australia International Ltd, Sydney.
BCA (2019)	Building Code of Australia 2019, Building Code of Australia, Australian Building Codes Board, Canberra 2019.
EPA Act (1979)	Environmental Planning and Assessment Act 1979, NSW Government, NSW, legislation found at <a href="http://www.legislation.nsw.gov.au">www.legislation.nsw.gov.au</a>
PBP (2019)	Planning for Bushfire Protection, a Guide for Councils,Planners, Fire Authorities, Developers and Home Owners. Rural Fire Service 2019, Australian Government Publishing Service, Canberra.
RFS (2015)	Rural Fire Service, Guide For Bush Fire Prone Land Mapping, Version 5b.

## SECTION 11. APPENDICES

Appendix A - Standards for Asset Protection.

Appendix B - Architectural Drawings.



# **APPENDIX A - STANDARDS FOR ASSET PROTECTION**

## **RFS STANDARDS FOR ASSET PROTECTION**

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

### **RAKING OR MANUAL REMOVAL OF FINE FUELS**

- Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of fire.
- Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

### **MOWING OR GRAZING OF GRASS**

- Grass needs to be kept short and, where possible, green.

### **REMOVAL OR PRUNING OF TREES, SHRUBS AND UNDERSTOREY**

- The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.
- Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.
- Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

### **WHEN CHOOSING PLANTS FOR REMOVAL, THE FOLLOWING BASIC RULES SHOULD BE FOLLOWED**

- Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or ‘undesirable species’. Alternatively, a list of noxious weeds can be obtained at [www.agric.nsw.gov.au/noxweed/](http://www.agric.nsw.gov.au/noxweed/);
- Remove more flammable species such as those with rough, flaky or stringy bark; and
- Remove or thin understorey plants, trees and shrubs less than three metres in height
- The removal of significant native species should be avoided.

## GARDEN DESIGN

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

### LAYOUT OF GARDENS IN AN APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.

### LAYOUT OF GARDENS IN AN APZ

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

- Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without “ribbons” hanging from branches or trunks; and
- dense crown and elevated branches.



# **APPENDIX B - ARCHITECTURAL DRAWINGS**

