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Bushfire Hazard Assessment

120-134 Farm Road Mulgoa 2745 (Lot 8/-/DP229785).

Project Details			
Assessed as:	Infill Development.		
Assessed by	Matthew Noone (BPAD Accreditation No. BPAD-PD 25584)		
Highest BAL on any facade	BAL-19		
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 Dual Occupancy Dwelling.		
Report Number	BR-342221-C		
Date of Issue	13/09/2021	Report Validity:	1 year from date of issue

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

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13/09/2021

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BUSHFIRE RISK ASSESSMENT CERTIFICATION

Development Address	120-134 Farm Road Mulgoa 2745.
Parcel number	(Lot 8/-/DP229785).
Development description	Proposed Dual Occupancy Dwelling.
Drawings Reviewed.	Attached to report BR-342221.
Assessed Bushfire Attack Level	BAL-19
Does the assessment rely on alternate solutions?	No.
Assessed by Matthew Noone BPAD Accreditation Scheme No.	FPAA No. BPAD-PD 25584
Certificate Number:	BR-342221-C

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

DATE	ISSUED TO	REV.	Comments
10/09/2021	Natasha Faruggia	B	Issued for DA lodgement.
15/10/2021	Natasha Faruggia	C	Issued for DA lodgement.

DISCLAIMER and TERMS OF USE

Bushfire Planning & Design cannot be held liable for the loss of life or property caused by a bushfire event. This report has considered the relevant planning instruments, bushfire constructions codes and practices applicable at the time of writing. Should additional information be provided after this report has been issued, we reserve the right to review and if necessary modify our report. Bushfire Planning and Design has no control over workmanship, buildings degrade over time and vegetation if not managed will regrow. In addition legislation and construction standards are subject to change. Due to significant variance of bushfire behaviour, we do not guarantee that the dwelling will withstand the passage of bushfire even if this development is constructed to the prescribed standards.

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*."

The information and material contained herein is general in nature and is intended for your use and information. This report relates only to the specific development described within and cannot be used to support any other future development. Bushfire Planning and Design disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the material contained herein. Bushfire Planning and Design does not warrant or represent that the material contained herein is free from errors or omissions, or that it is exhaustive.

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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) has 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 (or Client Representative) agree to and acknowledge the above statements.

Bushfire Planning and Design accepts no liability or responsibility for any use or reliance upon this report and its supporting material by any unauthorized third party. The validity of this report is nullified if used for any other purpose than for which it was commissioned. Unauthorized use of this report in any form is deemed an infringement of our intellectual property. By using this document to support your development you the Client (or Client representative) agree to these terms.

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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).

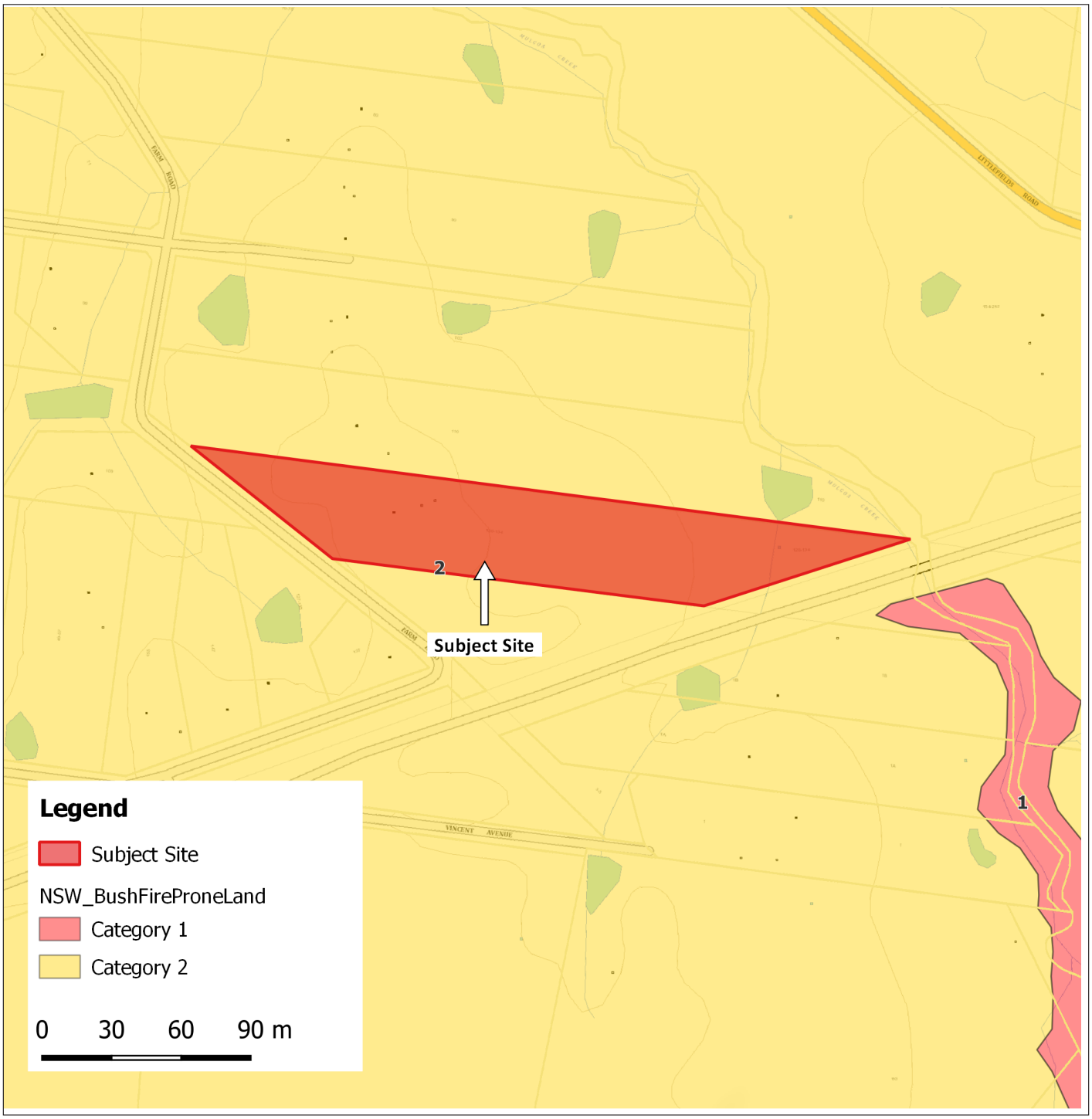

Figure 1.1: Bushfire Prone Land Map (NSW Planning Portal (2021) found at https://www.planningportal.nsw.gov.au) accessed 13/09/2021.

1.2 DEVELOPMENT PROPOSAL

The development relates to the construction of a dual occupancy dwelling. The existing dwelling will be demolished to facilitate the construction of the new dwelling.

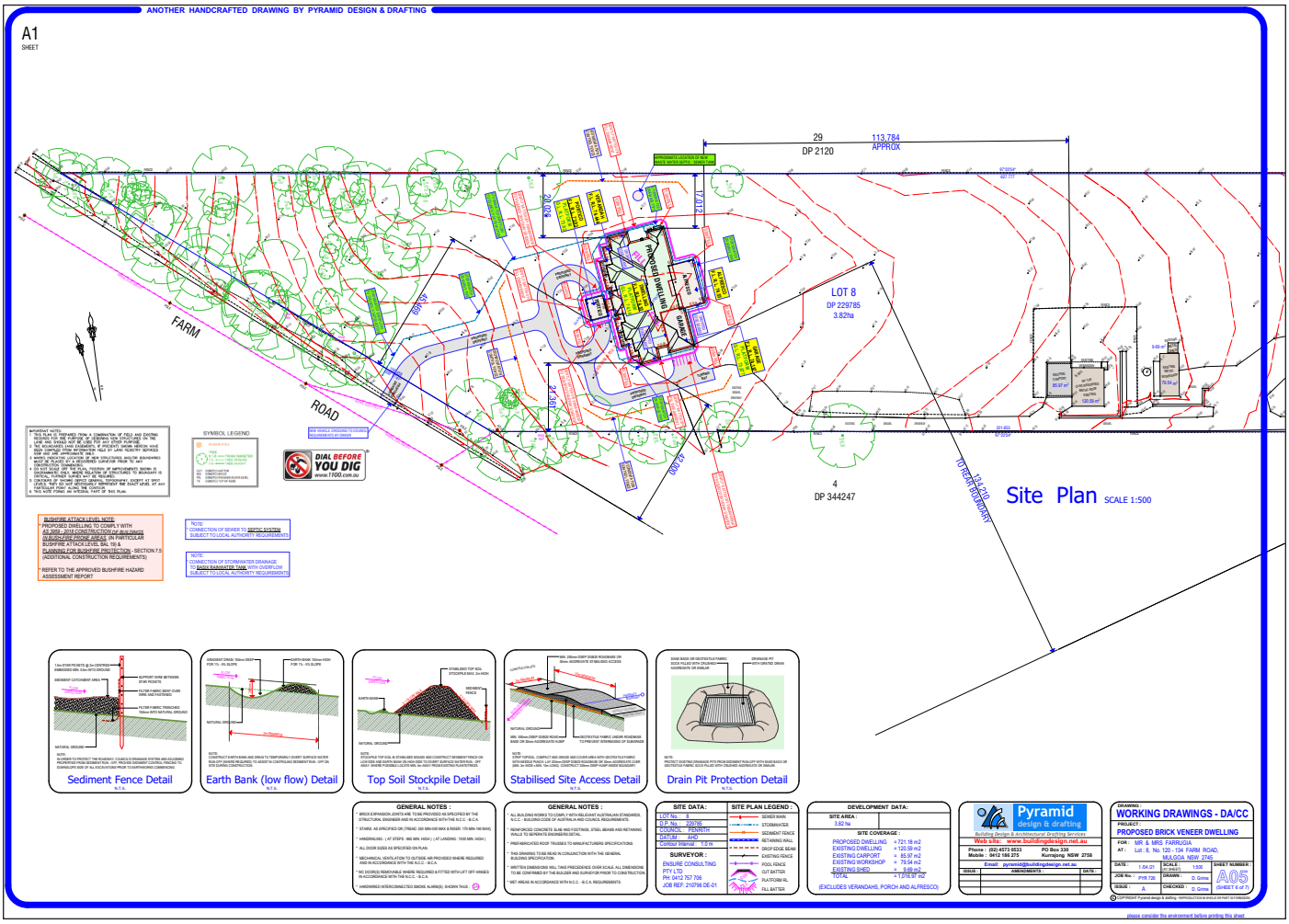

Figure 1.2: Architectural Site Plan.

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, Penrith 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 Mulgoa which is within the Penrith Local Government Area (LGA). The site is located in a rural residential area. There is an existing dwelling and granny flat on the subject site. The land to the north and west is managed residential land. The land to the east in the direction of the existing granny flat is managed land. A pipe line runs through the adjoining block to the south. The vegetation within the block to the south has been recently cleared leaving a fragmented parcel of remnant woodland in the north east corner.

1.5 LAND USE, ZONING AND PERMISSIBILITY

The subject site and surrounding allotment to the north is zoned E3 Environmental Management. A small parcel of E2 zoned land is located on the Eastern extent of the site. The land to the south is zoned SP2 Infrastructure.

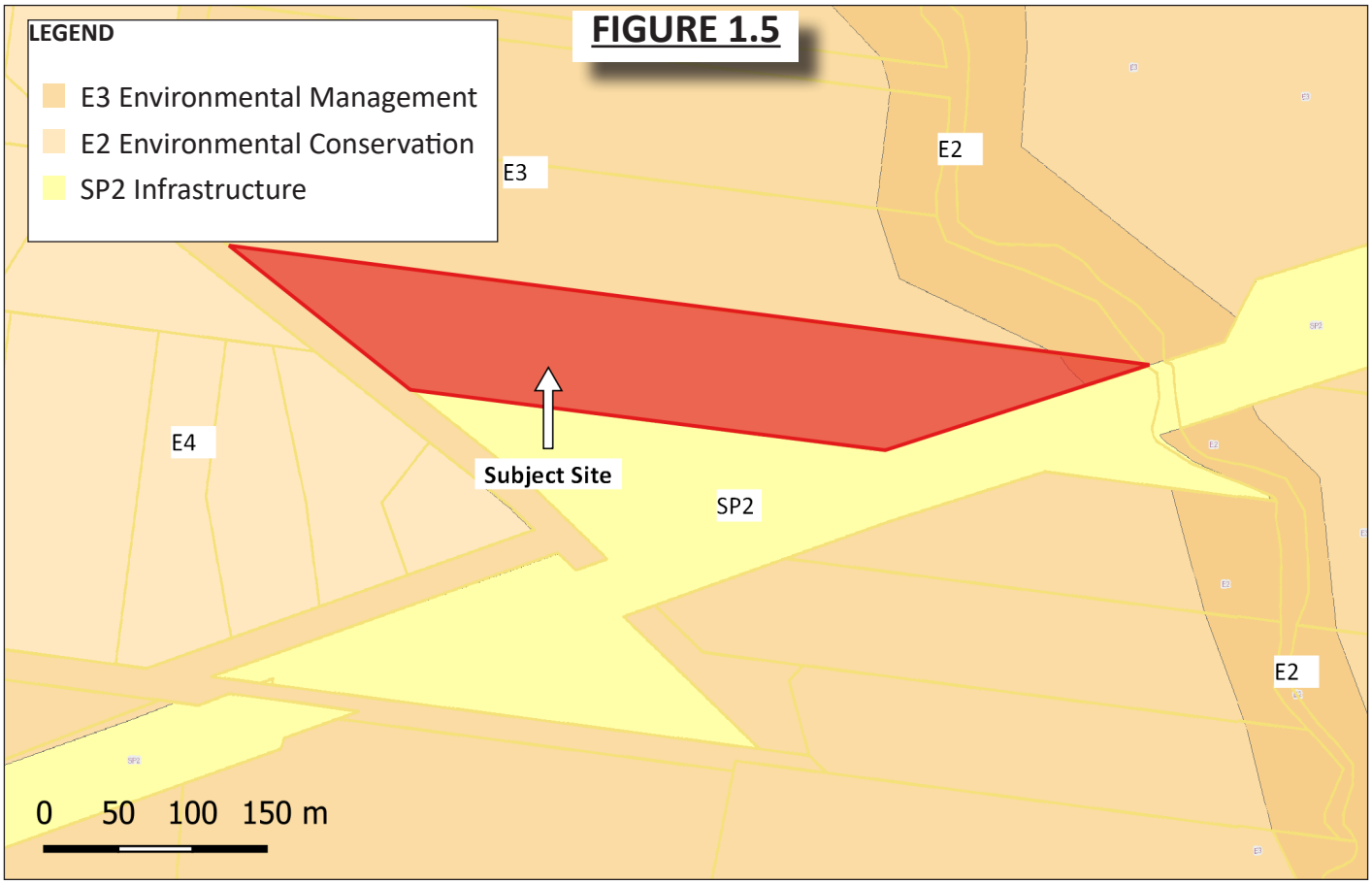

Figure 1.5: Land Zoning Map.

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: Managed land to the west of Farm Road.

Photo 2: Managed land to the west of Farm Road.

Photo 3: Remnant parcel of woodland in the western extent of the subject allotment.

Photo 4: Managed land to the north of the subject site.

Photo 5: Grassland to the south.

Photo 6: Grassland and remnant vegetation to the south east.

TABLE 1 - BAL ASSESSMENT (To be read in conjunction with Figure A).						
LGA = Penrith Council				Forest Fire Danger Index = FDI 100		
ASPECT [1]	**Vegetation Class [2]**	**Max Effective Slope [3]**	**Site slope [3]**	**Required APZ [4]**	**Proposed APZ / EML[5]**	**BAL-Rating**
W	Low Threat Vegetation	-	-	-	-	-
N, S, E, W	Grassland	-	-	> 20m [8]	> 20m [8]	BAL-12.5
S, SE	Remnant	0-5^0 D-S	N/A	21-29m	> 21m	BAL-19
AOD	Managed residential land					

Abbreviations		
AOD All other directions	EML Extent of managed land	NVC Narrow vegetation corridor

1	*Cardinal direction from each proposed building facade based on grid north.*
2	*Vegetation Classifications are as described in PBP (2019) A1.2.*
3	*Site slope is calculated from 1m LiDAR contours.*
4	*Minimum APZ required stated as Acceptable Solutions within Table 1.12.2 and A1.12.5. PBP (2019).*
5	*Actual dimensional setback from the face of the building to the assessed vegetation. Achieved Asset Protection Zone (APZ) or extent of managed land (EML).*
6	*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).*
7	*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).*
8	*Deeming provisions for grassland s.7.9 PBP (2019).*
9	*BAL-rating determined via method 2 (AS3959)*

2.3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT.

To clarify the findings above, a remnant parcel of woodland is located on the eastern extent of the subject allotment. The SP2 Infrastructure zoned land contains a remnant parcel of woodland less than 2500m^2 that is greater than 20m from the proposed building. The remainder of the land to the south has been recently cleared and is identified as a low threat. There is potential for vegetation regrowth if the current state of management is not continued. The adjoining allotment to the north is identified as managed land.

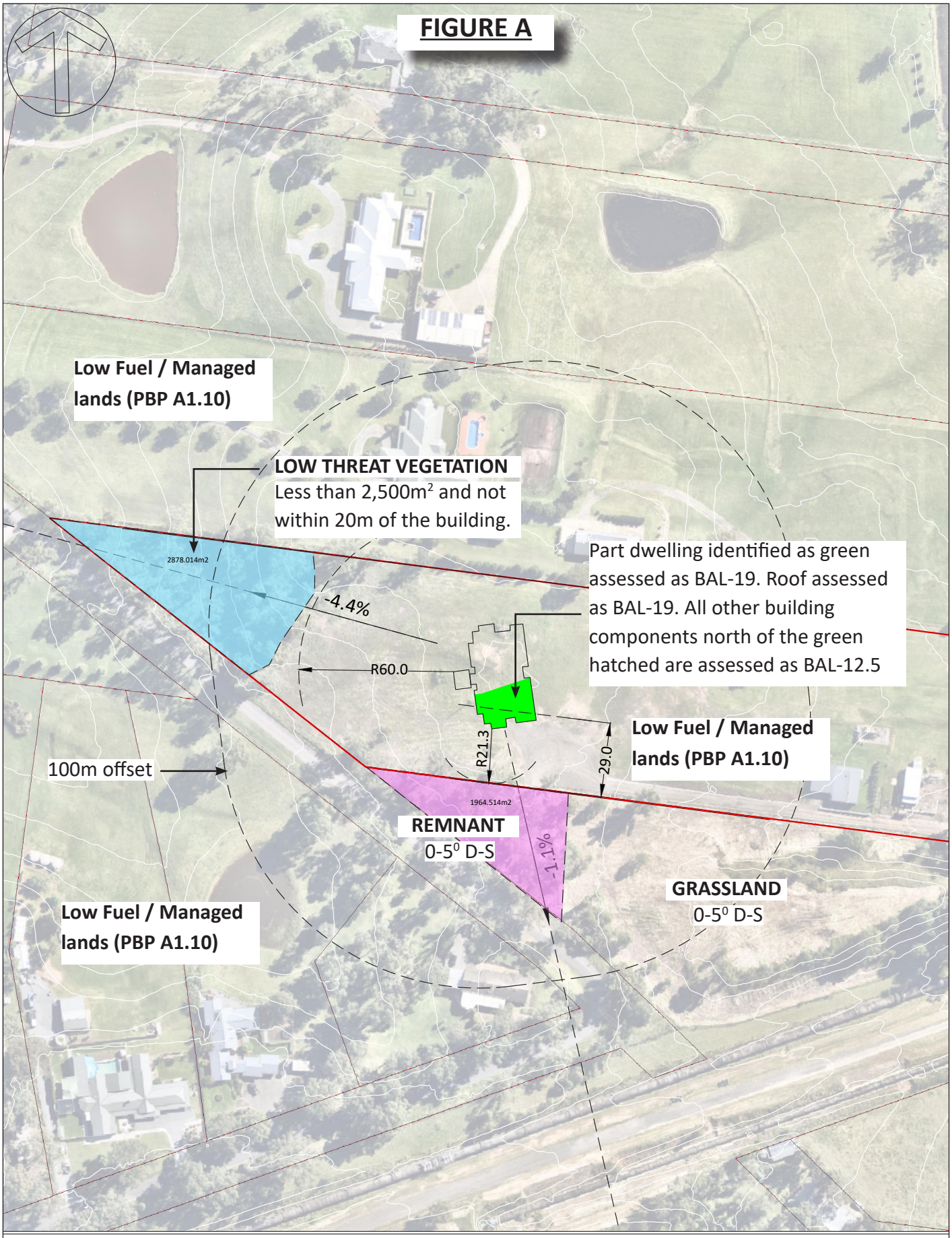
Based on the parameters identified in table 1 above and as depicted in Figure A, the proposed development is assessed as BAL-19 as specified in AS3959 (2018). Due to defined building articulation the proposed dwelling is to be constructed to BAL-12.5 and BAL-19 as indicated in figure A. The entire roof is to be constructed to BAL-19.

2.4 RECOMMENDED ASSET PROTECTION ZONES (APZs).

There is sufficient space within the site to provide an asset protection zone (APZ). A 21m APZ is required (and achieved) between the proposed building and any un-managed vegetation to the south. A 20m grassland APZ is required for all other directions. The proposed APZ is sufficient to achieve the nominated BAL-ratings and defendable space. The proposed APZ is to be managed as an inner asset protection zone for perpetuity. No trees are required to be removed for the purpose of creating the APZ.

Refer to Section 3 for recommendations relating to APZ provision.

FIGURE A



LEGEND

Woodland	Low Threat Vegetation	Grassland	Site Boundary	Hydrant
Rainforest	Forest	Managed Land		
Narrow Vegetation Corridor (NVC) PBP (2019) A1.10	Remnant Bushland PBP (2019) A1.10	Proposed works		

Meters
35 0 35 70
1:2000

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 defendable 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 defendable 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 defendable 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 18^0 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 defendable 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
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. 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 development is to be constructed to BAL-19 and 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 entire roof is to be constructed to BAL-19. 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.	

•	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 ROAD - SPECIFIC REQUIREMENTS
The public road system is suitable for emergency response vehicles. The site is accessed from Farm Road to the west. Figure 5.1 shows the road systems in the area.

PROPERTY ACCESS - SPECIFIC REQUIREMENTS
The proposed development is to provide the following where applicable;

-	A minimum carriageway width of four metres for rural-residential areas is required.
-	Provide a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches.
-	Curves are to have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.
-	The minimum distance between inner and outer curves is six metres.
-	The crossfall is not to be more than 10 degrees.
-	The maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.

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.	

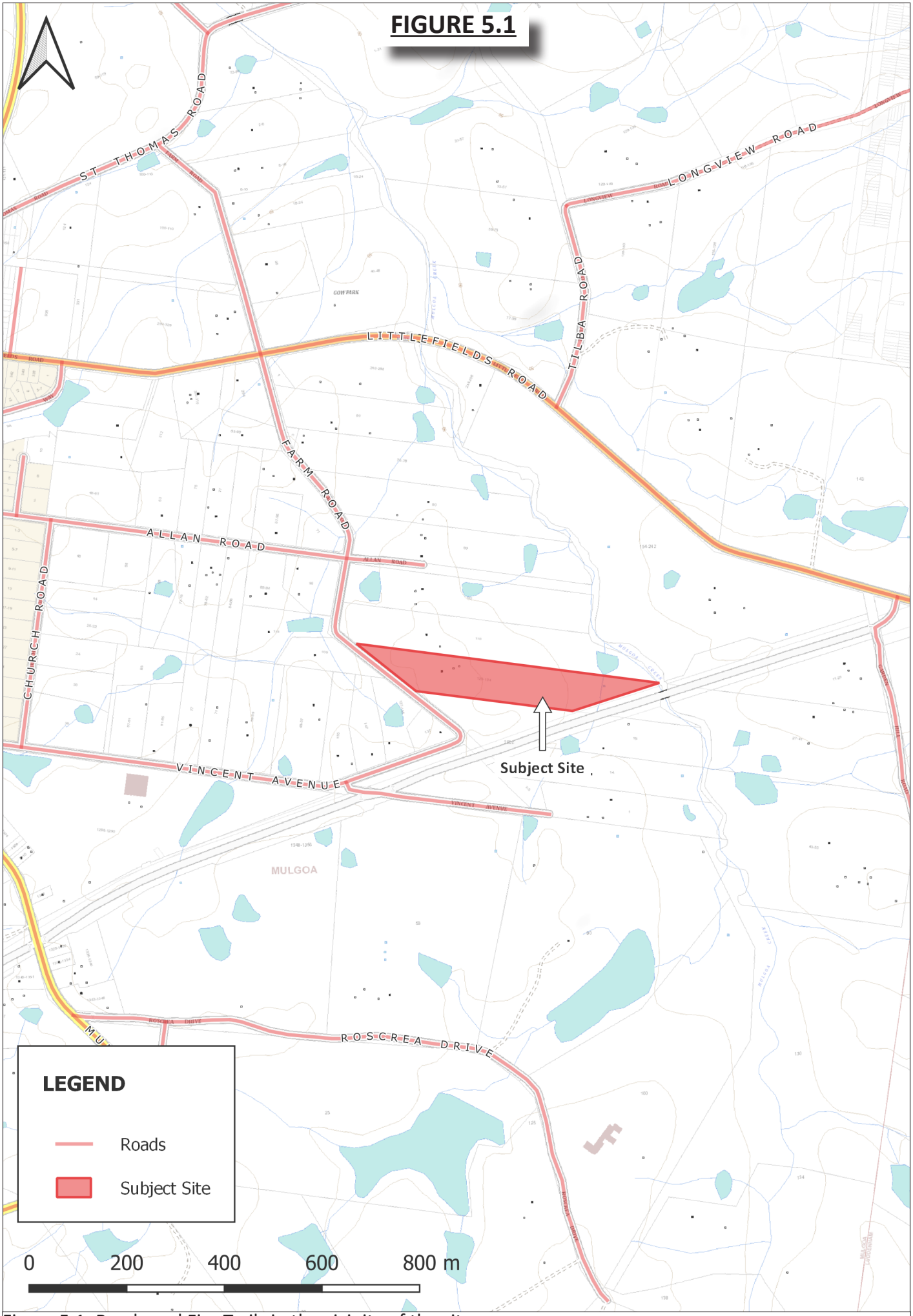

Figure 5.1: Roads and Fire Trails in the vicinity of the site.

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 provided for fire-fighting purposes.
•	The water supply is to be accessible and reliable for fire-fighting operations.
•	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. The site will rely on tank water. A minimum 20,000 litres is to be provided for fire suppression. We recommend that a 5hp or 3kW petrol or diesel-powered pump be provided. Any hose and reel for fire-fighting connected to the pump shall be 19mm (internal diameter) and capable of reaching all parts of the building. Where applicable, the following requirements are to be adhered to;

WATER REQUIREMENTS FOR NON-RETICULATED WATER AREAS	
•	A connection for fire-fighting purposes is to be 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 valves and pipes are to be adequate for water flow and are metal.
•	Supply pipes from tank to ball valve are to have the same bore size to ensure flow volume.
•	Underground tanks are to have an access hole of 200mm to allow tankers to refill direct from the tank.
•	A hardened ground surface for truck access is to be provided within 4m.
•	Above-ground tanks are to be manufactured from concrete or metal.
•	Raised tanks are to have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).
•	Unobstructed access is to be provided at all times.
•	Underground tanks are to be clearly marked.
•	Tanks on the hazard side are to be provided with adequate shielding for the protection of firefighters.
•	All exposed water pipes external to the building are to be metal, including any fittings.
•	Where pumps are provided, they are to be a minimum 5hp or 3kW petrol or diesel-powered pump, and are to be shielded against bush fire attack. Any hose and reel for fire-fighting connected to the pump shall be 19mm internal diameter.
•	Fire hose reels are to be constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005.

ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF WATER	ACCEPTABLE SOLUTION
The proposed development can comply with PBP (2019).	

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	Construct the dwelling to BAL-19 and BAL-12.5 as indicated in figure A (Section 2 & 4).
2.	Construction	Construct the entire roof to BAL-19.
3.	APZs	Create and or manage the nominated APZs for perpetuity (Section 3).
4.	Access	Comply with the access provisions noted in Section 5.
5.	Services	Comply with the services provisions noted in Section 6 and 7.
6.	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.	
7.	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 construction of a dual occupancy dwelling. The existing dwelling will be demolished to facilitate the construction of the new 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 Mulgoa which is within the Penrith Local Government Area (LGA). The site is located in a rural residential area. There is an existing dwelling and granny flat on the subject site. The land to the north and west is managed residential land. The land to the east in the direction of the existing granny flat is managed land. A pipe line runs through the adjoining block to the south. The vegetation within the block to the south has been recently cleared leaving a fragmented parcel of remnant woodland in the north east corner.

There is sufficient space within the site to provide an asset protection zone (APZ). A 21m APZ is required (and achieved) between the proposed building and any un-managed vegetation to the south. A 20m grassland APZ is required for all other directions. The proposed APZ is sufficient to achieve the nominated BAL-ratings and defendable space. The proposed APZ is to be managed as an inner asset protection zone for perpetuity. No trees are required to be removed for the purpose of creating the APZ.

The proposed development is assessed as BAL-19 and 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 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
Grad.Dip. Design for Bushfire Prone Areas.
BSc (Geology)
0406077222
T/A Bushfire Planning and Design

BPAD Bushfire Planning & Design
Accredited Practitioner
Level 2

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 www.legislation.nsw.gov.au
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.

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/;
- 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.

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.

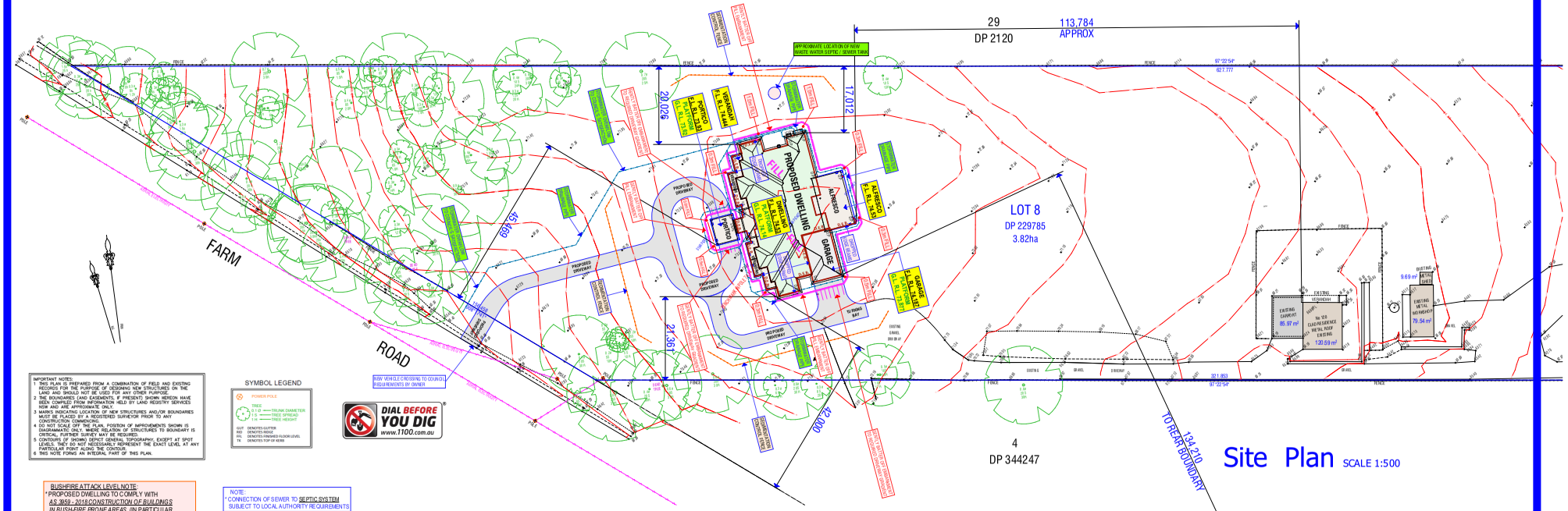
Plants that are less flammable, have the following features:

- 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

A1
SHEET



Site Plan SCALE 1:500

IMPORTANT NOTES:
1 THIS PLAN IS PREPARED FROM A COMBINATION OF FIELD AND EXISTING RECORDS FOR THE PURPOSE OF DESIGNING NEW STRUCTURES ON THE LAND AND IS NOT SUITABLE FOR ANY OTHER PURPOSE.
2 THE BOUNDARIES (AND EASEMENTS, IF PRESENT) SHOWN HEREON HAVE BEEN COMPILED FROM INFORMATION HELD BY LAND REGISTRY SERVICES NOW AND ARE APPROXIMATE ONLY.
3 MARKS INDICATING LOCATION OF NEW STRUCTURES AND/OR BOUNDARIES MUST BE PLACED BY A REGISTERED SURVEYOR PRIOR TO ANY CONSTRUCTION COMMENCING.
4 THE SCALE OF THIS PLAN & THE POSITION OF IMPROVEMENTS SHOWN IS DIAGRAMMATIC ONLY. WHERE RELATION OF STRUCTURES TO BOUNDARY IS CRITICAL, FURTHER SURVEY MAY BE REQUIRED.
5 CONTOURS (IF SHOWN) DEPICT GENERAL TOPOGRAPHY, EXCEPT AT SPOT LEVELS, THEY DO NOT NECESSARILY REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT ALONG THE CONTOUR.
6 THIS NOTE FORMS AN INTEGRAL PART OF THIS PLAN.

SYMBOL LEGEND

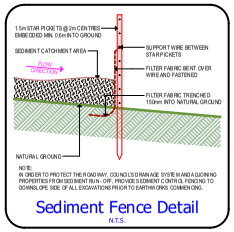
DIAL BEFORE YOU DIG www.1100.com.au

NEW VEHICLE CROSSING TO COUNCIL REQUIREMENTS BY OWNER

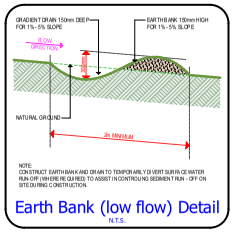
BUSHFIRE ATTACK LEVEL NOTE:
* PROPOSED DWELLING TO C OMPLY WITH AS 3959 - 2018 CONSTRUCTION OF BUILDINGS IN BUSH-FIRE PRONE AREAS, (IN PARTICULAR BUSHFIRE ATTACK LEVEL BAL 19) & PLANNING FOR BUSHFIRE PROTECTION - SECTION 7.5 (ADDITIONAL CONSTRUCTION REQUIREMENTS)
* REFER TO THE APPROVED BUSHFIRE HAZARD ASSESSMENT REPORT

NOTE:
* CONNECTION OF SEWER TO SEPTIC SYSTEM SUBJECT TO LOCAL AUTHORITY REQUIREMENTS

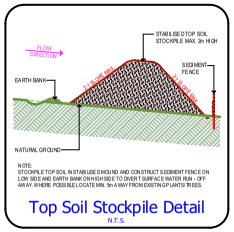
NOTE:
* CONNECTION OF STORMWATER DRAINAGE TO BASIX RAINWATER TANK WITH OVERFLOW SUBJECT TO LOCAL AUTHORITY REQUIREMENTS



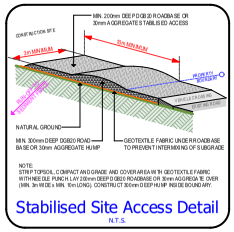
Sediment Fence Detail
N.T.S.



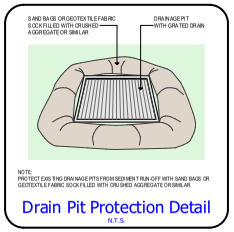
Earth Bank (low flow) Detail
N.T.S.



Top Soil Stockpile Detail
N.T.S.



Stabilised Site Access Detail
N.T.S.



Drain Pit Protection Detail
N.T.S.

GENERAL NOTES :

* BRICK EXPANSION JOINTS ARE TO BE PROVIDED AS SPECIFIED BY THE STRUCTURAL ENGINEER AND IN ACCORDANCE WITH THE N.C.C. - B.C.A.
* STAIRS AS SPECIFIED OR (TREAD: 250 MIN-300 MAX & RISER: 170 MIN-190 MAX)
* HANDRAILING : (AT STEPS : 865 MIN. HIGH) (AT LANDING : 1000 MIN. HIGH)
* ALL DOOR SIZES AS SPECIFIED ON PLAN.
* MECHANICAL VENTILATION TO OUTSIDE AIR PROVIDED WHERE REQUIRED AND IN ACCORDANCE WITH THE N.C.C. - B.C.A.
* WC DOOR(S) REMOVABLE WHERE REQUIRED & FITTED WITH LIFT OFF HINGES IN ACCORDANCE WITH THE N.C.C. - B.C.A.
* HARDWIRED INTERCONNECTED SMOKE ALARM(S) SHOWN THUS : (SA)

GENERAL NOTES :

* ALL BUILDING WORKS TO COMPLY WITH RELEVANT AUSTRALIAN STANDARDS, N.C.C. - BUILDING CODE OF AUSTRALIA AND COUNCIL REQUIREMENTS.
* REINFORCED CONCRETE SLAB AND FOOTINGS, STEEL BEAMS AND RETAINING WALLS TO SEPERATE ENGINEERS DETAIL
* PREFABRICATED ROOF TRUSSES TO MANUFACTURERS SPECIFICATIONS.
* THIS DRAWING TO BE READ IN CONJUNCTION WITH THE GENERAL BUILDING SPECIFICATION.
* WRITTEN DIMENSIONS WILL TAKE PRECEDENCE OVER SCALE. ALL DIMENSIONS TO BE CONFIRMED BY THE BUILDER AND SURVEYOR PRIOR TO CONSTRUCTION
* WET AREAS IN ACCORDANCE WITH N.C.C. - B.C.A. REQUIREMENTS.

SITE DATA:

LOT No. :	8
D.P. No. :	229785
COUNCIL :	PENRITH
DATUM :	AHD
Contour Interval :	1.0 m

SURVEYOR :
ENSURE CONSULTING PTY LTD
PH: 0412 757 706
JOB REF : 210796 DE-01

SITE PLAN LEGEND :

SEWER MAIN
STORMWATER
SEDIMENT FENCE
RETAINING WALL
DROP EDGE BEAM
EXISTING FENCE
POOL FENCE
CUT BATTER
PLATFORM RL.
FILL BATTER

DEVELOPMENT DATA:

SITE AREA : 3.82 ha

SITE COVERAGE :

PROPOSED DWELLING	= 721.16 m2
EXISTING DWELLING	= 120.59 m2
EXISTING CARPORT	= 85.97 m2
EXISTING WORKSHOP	= 79.54 m2
EXISTING SHED	= 9.69 m2
TOTAL	= 1,016.97 m2

(EXCLUDES VERANDAHS, PORCH AND ALFRESCO)

Pyramid design & drafting
Building Design & Architectural Drafting Services
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PO Box 330
Kurrajong NSW 2758
Email : pyramid@buildingdesign.net.au

ISSUE	AMENDMENTS :	DATE :

DRAWING : WORKING DRAWINGS - DA/CC
PROJECT : PROPOSED BRICK VENEER DWELLING
FOR : MR & MRS FARRUGIA.
AT : Lot : 8, No. 120 - 134 FARM ROAD, MULGOA NSW 2745

DATE :	1/04/21	SCALE : (At SHEET)	1:500
JOB No. :	PYR736	DRAWN :	D. Grima
ISSUE :	A	CHECKED :	D. Grima

SHEET NUMBER : A05 (SHEET 6 of 7)