BUSHFIRE RISK PTY LTD
assess • report • certify
ABN: 16 611 625 551

Mobile: 0447 211 375
mj@bushfirerisk.com.au
www.bushfirerisk.com.au

Strategic Bushfire Assessment

LEP Planning Proposal

Proposed Development: R5 – Rural Residential – LEP Rezoning Planning Proposal

Location: Mountain Ash Road
Gundary, Goulburn NSW 2580

Client: Windellama Road Pty Ltd & GTSMF Pty Ltd C/- Design Build Instruct Pty Ltd

Our Ref: 2112DBL1710

Date of Issue: 15 July 2022

Report prepared by **Melanie Jackson**

Grad Dip (Bushfire Protection); B.App.Sc (EnvResMgt)
BPAD-Level 3 Accredited Practitioner & Member of the FPA Australia

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EXPRIY

The results of this bushfire risk assessment contained herein should not be relied upon for a period extending 12 months from date of issue. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report should be issued.

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EXECUTIVE SUMMARY

This Bushfire Risk Assessment relates to the following location/lot/site:	Mountain Ash Road, Gundary, Goulburn NSW 2580 North of Mountain Ash Road the site comprises allotments known legally as Lots1 in DP779194, 103 in DP70346, 1 in DP853498 104, 105, 106 in DP126140 and 1, 2 in DP835278 South of Mountain Ash Road the allotments consist of Lots 3 in DP835278, 1 in DP731427 and 22, 23, 24 in DP811954.
Client/s:	Windellama Road Pty Ltd & GTSMF Pty Ltd C/- Design Build Instruct Pty Ltd
Site assessment:	20 April 2022
Proposed development:	R5 – Rural Residential – LEP Rezoning Planning Proposal.
Site Plans:	Site Layout Plan By: Stuart Design; 04-05-2022(Ref. Appendix A).
Does this planning proposal satisfy the Aims and Objectives of PBP?	YES
Is the planning proposal consistent in achieving compliance with the acceptable solutions pursuant to s.5 *Residential and Rural Residential Sub-divisions* (PBP 2019)?	YES – This report demonstrates compliance with the acceptable solutions and appropriate BPMs can be achieved in future DAs.
Does this development require consultation with the NSW Rural Fire Service?	YES – This report aims to assist Council and NSW RFS in determining their level of support relating to the planning proposal presented herein.
This assessment has been prepared and certified by Melanie Jackson BPAD-Level 3 Certified Practitioner; FPAA Cert. No: 21977	

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ABBREVIATIONS

Abbreviation	Description
APZ	Asset protection zone
AS3959	Australian Standard – Construction of Buildings in Bushfire Prone Areas
BAL	Bush fire attack level
BCA	Building Code of Australia
BFDB	Bush fire design brief
BFPL	Bush fire prone land
BFPL Map	Bush fire prone land map
BFSA	Bush fire safety authority
BLE	Building location envelope
BPM	Bush fire protection measure
DA	Development application
DCP	Development control plan
EP&A Act	*Environmental Planning & Assessment Act 1979*
FFDI	Forest fire danger index
GFDI	Grass fire danger index
IPA	Inner protection area
kW/m^2	Kilowatts per metre squared
LEP	Local environmental protection plan
NSW RFS	NSW Rural Fire Service
OPA	Outer protection area
PoM	Plan of Management
PBP	Planning for Bushfire Protection
RF Act	*Rural Fires Act 1997*
RF Reg	*Rural Fire Regulation 2013*
SEPP	*State Environmental Planning Policy*
SFPP	Special fire protection purpose
SFR	Short fire run

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1 INTRODUCTION

Bushfire Risk Pty Ltd was engaged by the client/s to conduct a Bushfire Risk Assessment for a planning proposal to amend the Goulburn-Mulwaree Local Environmental Plan 2009 (LEP) to rezone the subject site from RU1 land to a combination of suitable sized R5 Large Lot Residential Land on the urban fringes of Goulburn. Consistency with Direction 9.1 EPA Act 1979 pursuant to s.4.4 Planning for Bushfire Protection (PBP) 2019 is required.

Analysis for bushfire protection is required in the early planning stages to demonstrate suitability of the planning proposal to be incorporated into the LEP. The land subject to the rezoning application must ensure future development and land use is consistent with the legislative requirements whereby future development of the land shall meet the requirements set out in PBP at the DA stage.

1.1 Subject Site

North of Mountain Ash Road the site comprises allotments known legally as Lots1 in DP779194, 103 in DP70346, 1 in DP853498 104, 105, 106 in DP126140 and 1, 2 in DP835278 South of Mountain Ash Road the allotments consist of Lots 3 in DP835278, 1 in DP731427 and 22, 23, 24 in DP811954.

Address: Mountain Ash Road Gundary, Goulburn NSW 2580.

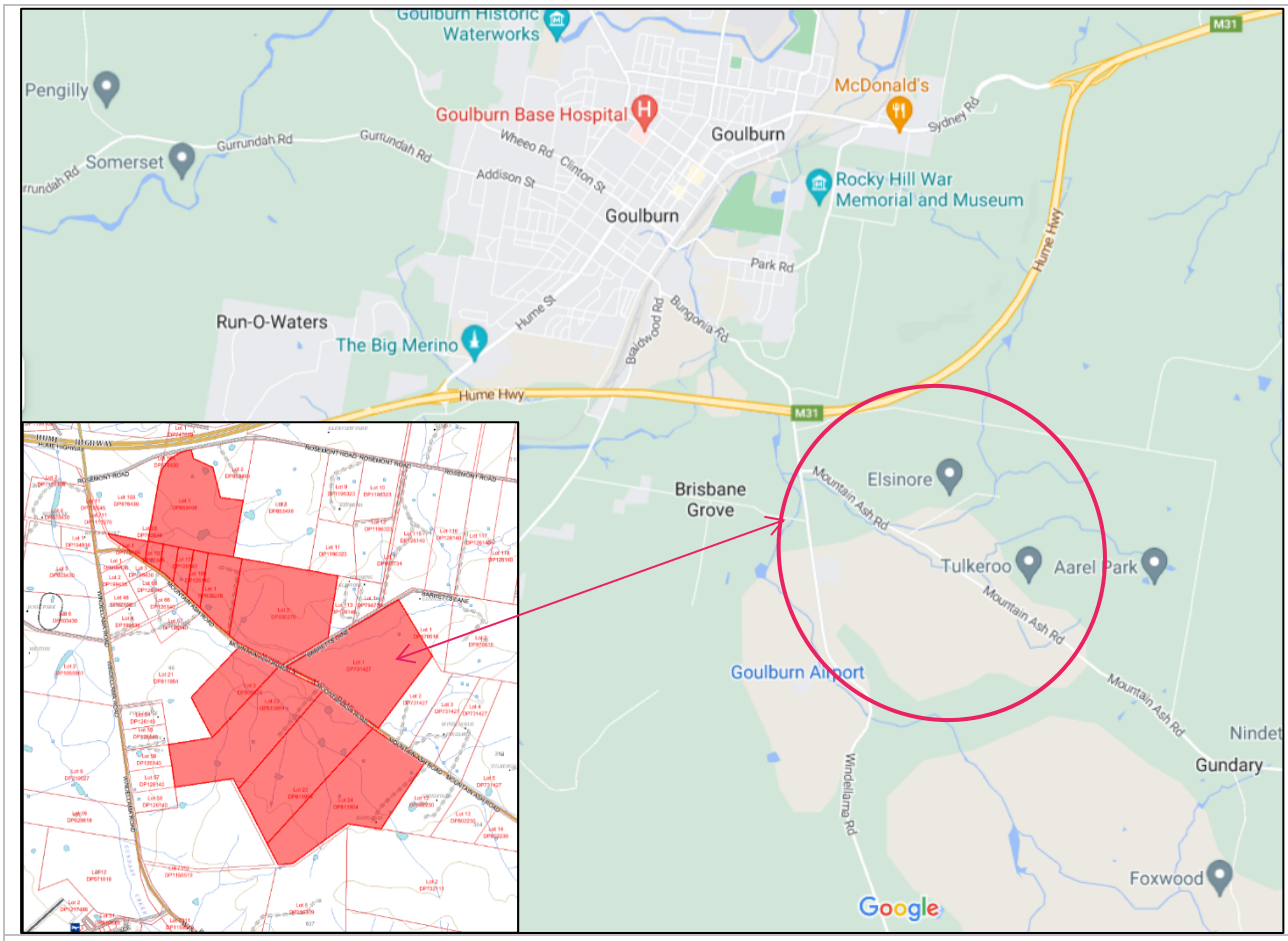


Figure 1: The subject site locality and surrounds (Source: Google 2022; FireMaps 2022)

1.2 Planning Proposal

R5 – Rural Residential – LEP Rezoning Planning Proposal.
108 lots – min. 2 hectare proposed lot size.

The existing land consist of 277ha in area with access via various access road reserves to be gazetted, through and surrounding the subject site from Windellama, Mountain Ash, Rosemont Roads and Barrett's Lane (Ref. Figure 2; Appendix A).

The proposal has been categorized into the following three (3) precincts (Ref Appendix A):

1. Adjacent to Mountain Ash Road and North of Barrett's Lane.
2. South of Barrett's Lane and East on Mountain Ash Road.
3. Southwest of Mountain Ash Road.

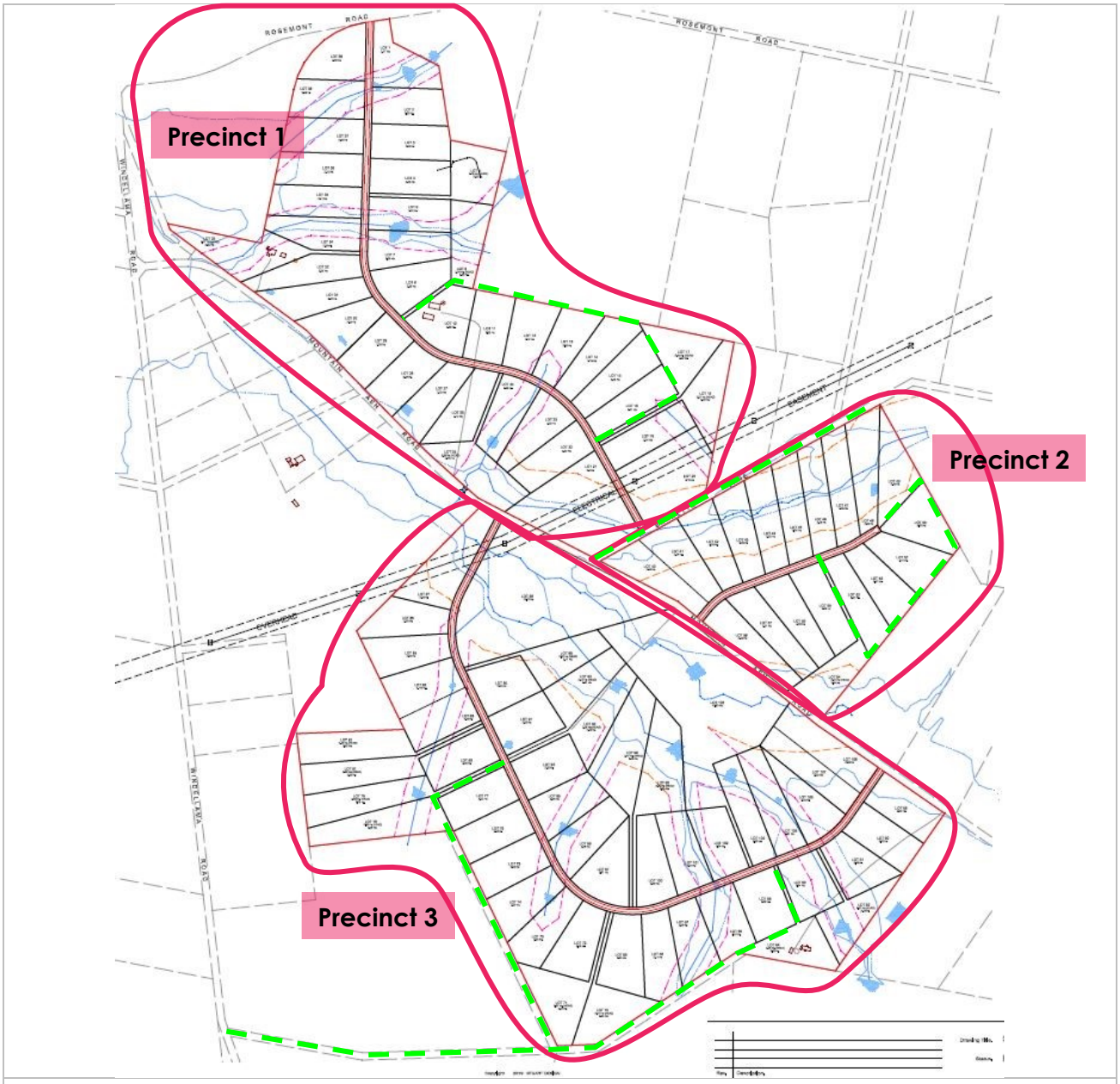


Figure 2: Proposed planning proposal layout (Source: Stuart Design)

1.3 Legislation

Direction 9.1 EPA Act 1979 and s.4.4 Planning for Bush Fire Protection applies to planning proposals that affect, or are in close proximity to, land mapped as BFPL. Under these directions, draft LEPs should follow the following objectives:

- To protect life, property and the environment from bush fire, by discouraging the establishment of incompatible land uses in bush fire prone areas; and
- To encourage sound management of bush fire prone areas.

The subject land requires an assessment during the strategic planning stages, to assess the suitability of proposed land use and associated future development for the use. Compliance with PBP is essential to ensure future development is able to comply with PBP at DA stage.

The above Bushfire Protection Objectives shall be implemented, negating high risk localities and unacceptable risk whilst prioritising adequate emergency access and egress, water supplies, APZ and building objectives shall be achievable for future development through the LEP to DA stage.

1.3.1 Bushfire Prone Land

The subject site is mapped as 'Bush Fire Prone Land' (BFPL), namely '*Vegetation Category 3*' (grassland), under s.10.3 Environmental Planning and Assessment Act 1979 (EPA Act), triggering the legislative requirements for building on bushfire prone land is applicable (Figure 3).

1.3.2 Development requiring a Bushfire Safety Authority (BFSA)

Proposed sub-divisions and special fire protection purpose (SFPP) developments as defined in PBP require approval from the NSW RFS in the form of a bushfire safety authority (BFSA) under s.100B *Rural Fires Act 1997*. Such developments are considered 'Integrated development' under s.4.46 of the *EP&A Act 1979*.

1.3.3 Residential and Rural Residential Sub-Division

The bushfire risk assessment for Residential and Rural Residential Sub-divisions shall be assessed against s.4.2 and s.5 of PBP (2019).

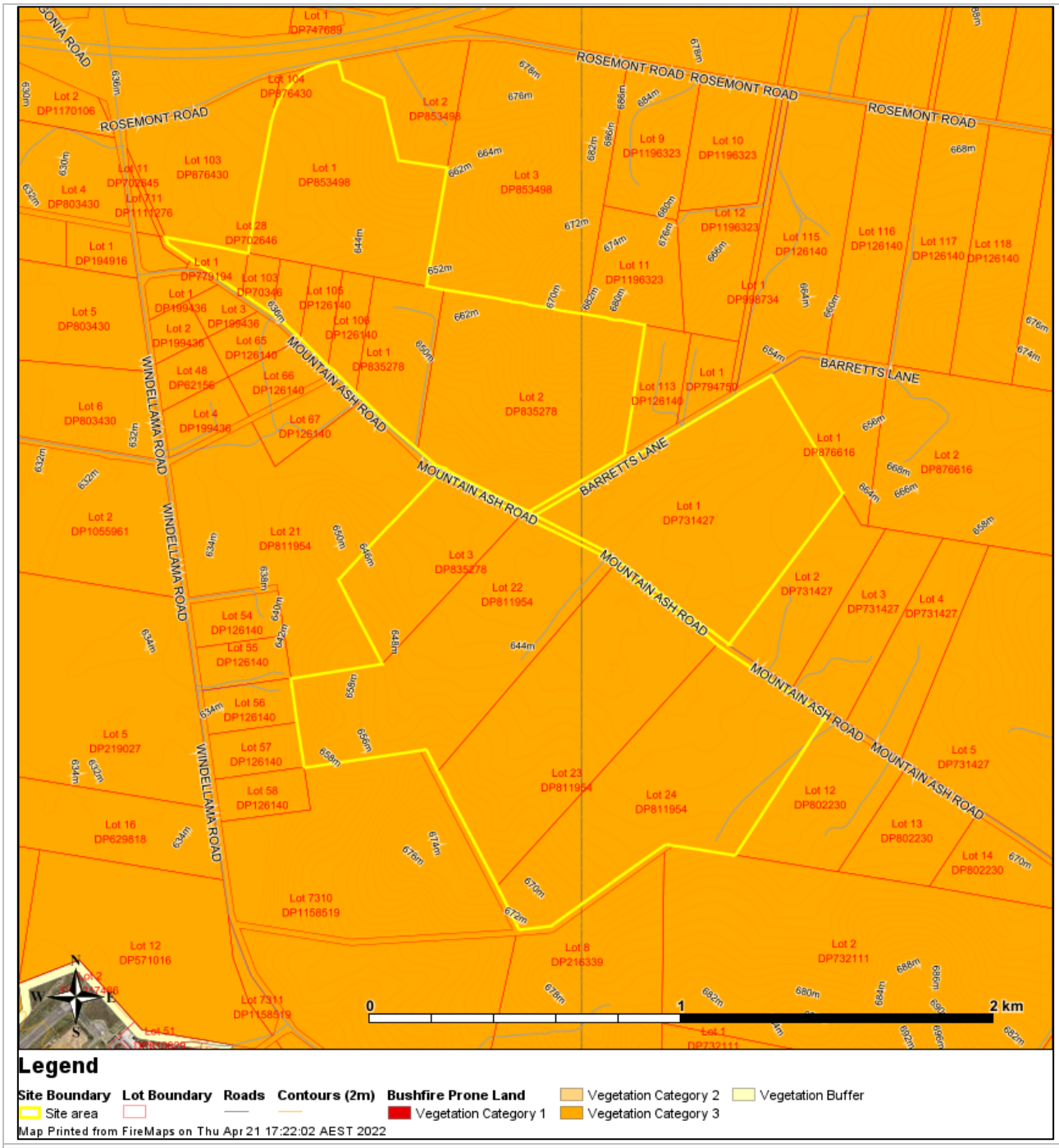


Figure 3: BFPL Map – vegetation category 3 – grassland (Source: FireMaps 2022)

1.3.4 Environmental, Ecological and Aboriginal Features

The scope of this bushfire report **does not** include any environmental, ecological or aboriginal assessment. As a result this report should be read in conjunction with the Statement of Environmental Effects (SEE) and any supporting assessments and reports submitted in support of the DA, which shall address the environmental, ecological or Aboriginal features known to the applicant/client for consideration during the Development Application (DA) process.

It is the responsibility of the applicant/client to disclose the details of any threatened species, population or ecological community identified under the Threatened Species Conservation Act 1995 that is known to the applicant to exist on the property and details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property.

Identification of any significant environmental features may include the following:

- Riparian corridors
- SEPP 14 – Costal Wetlands
- SEPP 26 Littoral Rainforest
- SEPP 44 – Koala Habitat
- Areas of geological interest
- Environmental protection zone or steep lands (>18°)
- Land slip or flood prone areas
- National parks estate or various other reserves
- Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant may include the following:
- Details of threatened species can be found online (www.environment.nsw.gov.au)
- Past studies or surveys for the area (e.g. local environment studies) Documentation supplied to council in relation to flora and fauna,
- Details of Aboriginal heritage known to the applicant
- Past surveys and information held by the DEC (application fees may apply).

1.4 Aim & Objectives

1.4.1 Aim and Objectives of PBP 2019

All development on BFPL must satisfy the aim and objectives of Planning for Bush Fire Protection (PBP 2019). This report demonstrates how future development can meet the requirements by ensuring the suite of Bushfire Protection Measures (BPM) are able to be implemented, place commensurate with the level of risk.

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

The objectives are to:

- Afford buildings and their occupants protection from exposure to a bush fire.
- Provide for a defendable space to be located around buildings.
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available.
- Provide for ongoing management and maintenance of BPMs; and
- Ensure that utility services are adequate to meet the needs of firefighters.

1.4.2 Specific Objectives – Subdivisions (s.5 PBP)

- Minimise perimeters of the subdivision exposed to the bushfire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided).
- Minimise vegetation corridors that permit the passage of bushfire towards buildings.
- Provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests.
- Ensure that APZs between a bushfire hazard and future dwellings are effectively designed to address the relevant bushfire attack mechanisms.
- Ensure the ongoing maintenance of APZs.
- Provide adequate access from all properties to the wider road network for residents and emergency services.
- Provide access to hazard vegetation to facilitate bushfire mitigation works and fire suppression.
- Ensure the provision of an adequate supply of water and other services to facilitate effective fire fighting.

2 BUSHFIRE RISK ASSESSMENT

This bushfire risk assessment includes analysis of the hazard, threat and subsequent risk to the development in relation to the following proposed land use:

- R5 – Large Lot Residential (min. 2ha lots).
- 108 lots.

2.1 Methodology

2.1.1 PBP 2019

The bushfire risk assessment was undertaken in accordance with s.4.4 *Local Environmental Plans (LEPs)* and s.5 *Rural and Residential Development* (PBP 2019). The planning proposal shall comply with the strategic issues set out in Table s.4.2.1 (PBP 2019; Ref. Table 1) followed by an assessment against *s.5 – Residential and Rural Residential Subdivisions* (PBP 2019; Ref. Table 2; Table 3). Compliance must be demonstrated in order to obtain NSW RFS support for the planning proposal.

2.1.2 Site Analysis

A desktop assessment was carried out pursuant to the methodology described in PBP 2019 commensurate with the proposed development type and level of risk, including the following:

- Minimum distance for APZs was determined in accordance with Table A1.12.2 – *residential development, FFDI 100 areas (≤29kW/m², 1090K)* (Ref. Appendix 1 PBP).

2.1.3 Vegetation & Significant Environmental Features

An assessment to classify the predominant vegetation type on and surrounding the subject site (out to a distance of 140m from the property boundaries) was undertaken, using Keith (2006) vegetation classification system as described in PBP (2019)

2.1.4 Slope & Aspect

An assessment of the aspect and effective slope, being the land under the classified vegetation most likely to have the greatest effect on bushfire behaviour within 100m of the site was undertaken. Slope analysis was undertaken using assessment methodology:

- A desktop assessment of contours available via the Fire Protection Association (FPAA) *FireMaps NSW* platform (FPAA 2021).

2.1.5 Bushfire Protection Measures (BPM)

The BPMs for rural and rural residential subdivisions require the following bushfire protection measures to be satisfied:

- APZ; Access to structures and water supply and fire trail access;
- Provision of water supplies, electricity & gas which negate bushfire risk to buildings.

Table 1: Bushfire Strategic Study

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS

Bushfire landscape assessment	A bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	• The bushfire hazard in the surrounding area, including:
		  • Vegetation
		  • Topography
		  • Weather
		• The potential fire behaviour that might be generated based on the above;
		• Any history of bushfire in the area;
		• Potential fire runs into the site and the intensity of such fire run; and
		• The difficulty in accessing and supressing a fire, the continuity of bushfire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.

Comment/s:

- The site is gently undulating to flat consisting of agricultural cropping and grazing land in all directions;
- Situated 2km from Goulburn, the local climatic data (Goulburn) is a temperate to cool area, with warm to hot summers, cool nights and cold/cool winters with variable and unreliable rainfall (800mm – 1000mm (annually) during winter and spring (NSW BFCC 2019).
- Climatic data indicates longer bushfire danger periods due to an increase in hot dry days as less rainfall is predicted.
- Grassfires move very quickly throughout the landscape having been known to sever roads and railway lines. Both legal and illegal burning off and lightning ignition are common causes of bushfire which has led to major fires occurring in a 5-7 year cycle (NSW BFCC 2019).
- The Gundary development is a mapped area identified as medium risk in the Southern Highlands BFMC (2019) and significant bushfire events noted as unlikely (BFMC 2019).

Map ref #	Asset type	Asset sub type	Asset name	LGA	Display area	Likelihood	Consequence	Risk	Priority	Treatment number
50	Human Settlement	Residential	Gundary Development in	Goulburn Mulwaree	Southern Tablelands 1	Unlikely	Major	Medium	4	15; 34; 32; 33; 23; 25; 9; 10; 11; 12; 13; 14; 20; 21; 22

	• Asset protection zones are vital, in addition to road networks therefore it is prudent to ensure adequate bushfire design enhances public safety. • Fire management provisions should be carefully considered, including road placement, APZ and landscaping provisions to negate fire spread, i.e. road placement beneficial as a fire break; planting of windbreaks or riparian corridors along water courses (riparian zones) may reduce/slow a fast moving fire designed to enhance property protection and easements documenting larger APZs and landscaping requirements to be incorporated at the design and DA stage.

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	• The risk profile of different areas of the development layout based on the above landscape study; • The proposed land use zones and permitted uses; • The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and • The impact of the siting of these uses on APZ provision.
Comment/s	• The gently undulating grassland landscape presents as a low risk. • Large lot residential developments are generally managed in a low fuel nature, including slashed/mown grass, swimming pools sheds and small livestock, managed around the curtilage of dwellings and other structures. • The proposed large lot residential use is appropriate in the landscape. • A planning proposal has been prepared and consistent with Councils long term planning goals.	

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	• The capacity for the proposed road network to deal with evacuation residents and responding emergency services, based on the existing and proposed community profile; • The location of key access routes and direction of travel; and • The potential for development to be isolated in the event of a bushfire.

Comment/s	• Consisting of large lot residential (2ha) lots on the road network and evacuation capacity, is unlikely to be impacted due to the low lot yield per hectare. • Close to town and major highway routes negates isolation of the development during a bushfire event. • Provision for additional emergency access and egress points for enhanced bushfire and flood protection shall be created via addional public formed roads (i.e. Barrett's Lane), Paper Roads and unnamed crown road reserves, and private properties with easements/covenants to be established.

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Emergency services	An assessment of the future impact of new development on emergency services.	• Consideration of the increase in demand for emergency services responding to a bushfire emergency including the need for new stations/brigades; and • Impact on the ability of emergency services to carry out fire suppression in a bushfire emergency.
Comment/s	• Additional access roads provide additional operational access and fire breaks across the landscape.	

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	• The ability of the reticulated water system to deal with a major bushfire event in terms of pressures, flows, and spacing of hydrants; and • Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Comment/s	• Reticulated water should be extended to the development area. • Professional hydraulic advice during the planning stages shall be presented to Council in order to ensure compliance can be achieved pursuant to the requirements of PBP and Councils long term goals.	

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bushfire management.	• Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bushfire Management Plans.

Comment/s	• The proposed land use shall not be provided in a manner which will burden adjacent lands, e.g. APZ shall be contained within each lot. • Emergency access traversing private land; the developer shall place a legally binding agreement on the development/lots as part of the sub-division i.e. s.88b instrument/easement.

3 ANALYSIS & RESULTS

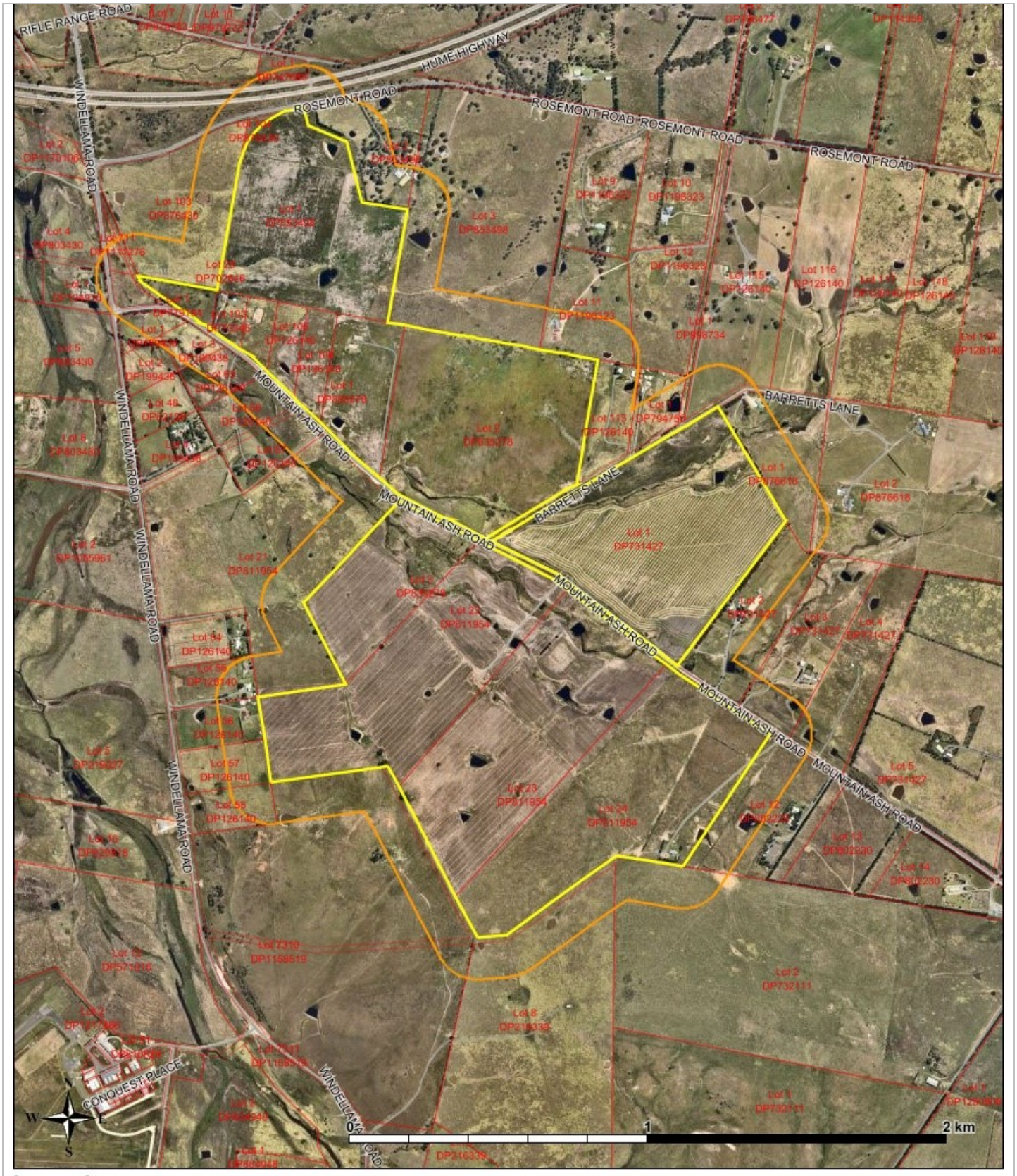
The following sections describe in detail, the vegetation type, slope, access, availability of water supplies and environmental considerations for the subject site and surrounds.

3.1 Site Assessment Details

20 April 2022 by Melanie Jackson (BPAD-Level 3 Accredited Practitioner No. 21977), (Ref. Table 2; Figure 4).

Table 2: Vegetation Analysis

Vegetation Formation, Direction/Plot & Description	Photo/s
Grassland – all directions The predominant vegetation type is predominantly cleared modified land including grassland, grazed pasture and cropping land classified as grassland. The site is predominantly flat to gently undulating land with various riparian zones with	 Photo 1: grazed pasture (image courtesy Simon Halcrow – Design Build Instruct)  Photo 2: grassland (image courtesy Simon Halcrow – Design Build Instruct)



Legend

140m survey	Site Boundary	Lot Boundary	Roads
Investigation area	Site area		

Map Printed from FireMaps on Tue Apr 12 14:13:31 AEST 2022

Figure 4: Aerial image of the subject site and investigation area (Source: FireMaps 2022; Nearmap 2022)

3.2 Bushfire Protection Measures (BPM)

The BPMs, namely APZ, landscaping, access, services: water, electricity and gas, provide a set of acceptable solutions which should be satisfied whereby they negate future non-compliance issues at DA stage. The results and comments are presented in *Table 3: Compliance Table; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)* below.

Table 3: Compliance Table; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
The intent may be achieved where:			
s.5.3.1 APZ – Intent of measures: To provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.			
APZ	• Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot.	• APZs are provided in accordance with Tables A1.12.2 or A1.12.3 based on the FFDI.	APZs commensurate with table A1.12.2 (FFDI 100 area) are deemed to comply with the acceptable solution/s; Negative impacts to future DAs is unlikely as the acceptable solution/s can be met within individual lots.
APZ	• APZs are managed and maintained to prevent the spread of a fire towards a building.	• APZs are managed in accordance with the requirements of Appendix 4 (PBP).	APZs shall be conditioned at the Sub-division stage and during the development of each lot enabling compliance pursuant to the requirements set out in Appendix 4 PBP.
APZ	• The APZ is provided in perpetuity.	• APZs are wholly within the boundaries of the development site.	Compliance pursuant to the acceptable solutions. Low fuel areas i.e. paved roads, footpaths, may be absorbed into future APZs. Ongoing management of the APZ is required in perpetuity. Therefore,

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
			management of the APZ adjacent to the release of each precinct or stage, must include provisions that ensure ongoing maintenance i.e. by the developer until such time as the land is developed or subsequent release of precincts and stages. An easement or covenant (s.88b instrument) indicating ongoing vegetation management, funding requirements, ownership as applicable to the development and subject to the design and conditions imposed on the development at DA stage. A PoM may be issued either in addition to or in lieu of a s.88b instrument.
APZ	• APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	• APZ are located on lands with a slope less than 18 degrees.	Complies with the acceptable solution.
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.	• Landscaping is in accordance with Appendix 4 (PBP); & • Fencing is constructed in accordance with section 7.6.	Compliance pursuant to the acceptable solutions shall be met. Landscaping and fencing construction shall be conditioned at DA stage ensuring the development of each lot complies with the acceptable solutions.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
			The subject land does not appear to require significant 'native' vegetation modification or removal, as a result, landscaping requirements are unlikely to have a negative effect on future DAs.
s.5.3.2 Access – Intent of measures: To provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.			
Access (General Requirements)	• Firefighting vehicles are provided with safe, all-weather access to structures.	• Property access roads are two-wheel drive, all- weather roads. • Perimeter roads are provided for residential subdivisions of three or more allotments. • Subdivisions of three or more allotments have more than one access in and out of the development. • Traffic management devices are constructed to not prohibit access by emergency services vehicles. • Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient. • All roads are through roads.	Compliance with the acceptable solutions shall be met with exception that a single dead end road is proposed for stage 2, which shall be provided pursuant to the performance criteria. Compliance with the acceptable solutions and performance criteria shall incorporate the following provisions. As a rural residential (min. 2ha lot size) subdivision the need for a perimeter road is negated whereby the APZ can be provided wholly within each 2ha lot. However in order to provide additional emergency access and egress (i.e. for bushfire and flooding) the existing public formed sealed roads (i.e. Barrett's Lane), Paper Roads, Unnamed Crown Road Reserves, and fire trails via private lots shall be nominated for emergency use.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
		• Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end. • Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and • One way only public access roads are no less than 3.5metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	Legally binding easements/covenants shall be placed over private land and vegetation management to be established/conditioned. **Precinct 1 & 3 Public Road: P**ublic access shall have two entry/exit points consistent with the acceptable solutions. **Precinct 2 Public Road:** A single 8m wide, two-way sealed road into stage 2 will not be a through road, a large turning head (min. 12m radius) shall be installed pursuant to Appendix 3 PBP (Ref. Appendix B herein), at the farthest end of the road, which shall be approx. 500m in length. The bushfire threat being negated due to the subdivision of the land and as a result the importance placed on two-way roads is no longer an issue as the resultant subdivision removes the bushfire risk, resulting in safe, all weather access to structures for firefighting vehicles. Precinct 2 therefore complies with the performance criteria for a single road. Provisions for parking, hydrants, signposts, gradients etc. for all precincts is commensurate with the acceptable solutions.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
			Stages developments shall incorporate road designs to ensure ongoing safety, and all weather access to structures until remaining stages are released therefore providing easements and or a Plan of Management shall be provided: • Comply with the requirements for ongoing vegetation and access management whereby a s.88b instrument shall be issued ensuring ongoing management is undertaken in perpetuity or extinguished upon release of each stage; and/or • A PoM should be issued either in addition to or in lieu of a s.88b instrument indicating ongoing vegetation management/funding requirements etc. (subject to RFS preferred requirements).
Access (General Requirements)	• The capacity of access roads is adequate for firefighting vehicles.	• The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.	Compliance with the acceptable solutions shall be met.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
Access (General Requirements)	• There is appropriate access to water supply.	• Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression. • Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 – *Fire hydrant installations System design, installation and commissioning*; and • There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Compliance with the acceptable solutions shall be met. Hydrants shall be provided pursuant to the relevant clauses and relevant Australian Standards.
Non-perimeter Roads	• Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	• Minimum 5.5m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width. • Hydrants are located clear of parking areas. • Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m. • Curves of roads have a minimum inner radius of 6m.	Compliance with the acceptable solution shall be achieved. **Precinct 2 – Redundancies:** An 8m wide carriageway (kerb to kerb) should be provided as a level of redundancy to compensate for the one way public road. **Redundant Emergency Access/Egress:** Additional access shall be provided in lieu of perimeter roads, via emergency access/egress roads for use during bushfire and flooding emergencies. By utilising the existing public formed sealed roads i.e. Barrett's Lane, Paper Roads, Unnamed Crown Road Reserves, and fire trails via

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
		• The road crossfall does not exceed 3 degrees. & • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	private lots will enhance operational and emergency access/egress loop roads in strategic locations (Ref. Figure 5 to Figure 7 herein).
Property Access	• Firefighting vehicles can access the dwelling and exit the property safely.	• There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: • Minimum 4m carriageway width. • In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay. • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.	Complies with the acceptable solution whereby no specific property access roads are required. • Battle-axe lots shall be provided with a min. 5.5m wide access handle clear of significant vegetation; • A min. 4m wide, all-weather carriageway shall be provided; • Provisions for turning heads, grades, curves and crossfall shall comply with the acceptable solutions and Appendix 3 PBP (Ref. Appendix B herein).

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
		• Provide a suitable turning area in accordance with Appendix 3. • Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress. • The minimum distance between inner and outer curves is 6m. • The crossfall is not more than 10 degrees. • Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.	

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
s.5.3.3 Services – Water, Electricity and Gas – 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.			
Water Supplies	• Adequate water supplies are provided for firefighting purposes.	• Reticulated water is to be provided to the development where available. • A static water and hydrant supply are provided for non-reticulated developments or where reticulated water supply cannot be guaranteed. & • Static water supplies shall comply with Table 5.3d.	Compliance with the acceptable solution shall be met. Infrastructure upgrades to provide reticulated water supplies is recommended. Static water supplies are not recommended.
Water Supplies	• Water supplies are located at regular intervals; and • The water supply is accessible and reliable for firefighting operations.	• Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005. • Hydrants are not located within any road carriageway; and • Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Compliance with the acceptable solutions shall be met. Infrastructure upgrades shall ensure adequate reticulated water supplies and hydrants are provided, i.e. spacing, design etc. which shall be implemented pursuant to the acceptable solutions and relevant clauses of the Australian Standards.
Water Supplies	• Flows and pressure are appropriate.	• Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	Compliance with the acceptable solution shall be met. Fire hydrants installed pursuant to the relevant clauses of the Australian Standard.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
Water Supplies	• The integrity of the water supply is maintained.	• All above-ground water service pipes are metal, including and up to any taps. & • Above-ground water storage tanks shall be of concrete or metal.	Compliance with the acceptable solutions shall be met i.e. at DA stage.

Electricity Services	Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	• Where practicable, electrical transmission lines are underground; and
		• Where overhead, electrical transmission lines are proposed as follows:
		  • Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and
		  • No part of a tree is closer to a power line than the distance set out in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.
			Compliance with the acceptable solutions shall be met.
			All upgrades and new electricity supply services and installation shall be undertaken in accordance with the acceptable solutions.
			Preference should be made towards underground electricity lines where practicable.

Gas Services	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - *The storage and handling of LP Gas*, the requirements of relevant authorities, and metal piping is used.	Compliance with the acceptable solutions shall be met where reticulated gas is proposed. Conditions for bottled gas requirements shall be met at DA stage pursuant to the acceptable solutions.

Compliance Tables; Re: *s.5 – Residential and Rural Residential Subdivisions* (PBP)			
BPM	**Performance Criteria**	**Acceptable Solutions**	**Comments**
		• All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. • Connections to and from gas cylinders are metal. • Polymer-sheathed flexible gas supply lines are not used; and • Above-ground gas service pipes are metal, including and up to any outlets.	
Construction	The maximum BAL rating/s for the future development on new lots shall comply with the acceptable solutions by achieving the 'BAL-29 or Lower' in accordance with the acceptable solutions set out in PBP, whereby appropriate APZs shall be commensurate with Table A1.12.2 (PBP 2019). The planning proposal presents R5 – large residential lots, minimum lot size of 2 ha per lot. The ample lot size is sufficient to accommodate appropriate APZs to achieve BAL-29 or lower construction level. Future development should achieve the '*Deemed to Satisfy'* provisions of the NCC and further development of each lot e.g. construction of a 'Class 1a' dwelling, shall be subject to a *Development Application* under s.4.14 EP&A Act or *Complying Development Application* pursuant to the *State Environment Planning Code (SEPP) – Exempt and Complying Development*.		

4 DISCUSSION

The following bushfire protection measures in combination can be applied during the planning stage. The proposed large rural-residential lot layout incorporating minimum 2ha lot size is deemed appropriate. The BPMs in combination aim to comply with the acceptable solutions or negate additional or strict compliance with PBP due to the low risk nature of the proposed or surrounding lot sizes and/or use.

The planning proposal therefore is able to incorporate measures pursuant to the performance criteria where shortfalls in the BPMs is presented herein. The following summaries of each BPM is presented below demonstrating how compliance can be met against the criteria and solutions set out in s.*5 – Residential and Rural Residential Subdivisions* (PBP).

4.1 APZ

Appropriate setbacks commensurate with BAL-29 or lower construction level are deemed acceptable, thus meeting the acceptable solutions pursuant to s.5.3a PBP, therefore APZ requirements are unlikely to negatively affect future Das and compliance can be met.

4.2 Landscaping

Compliance pursuant to the acceptable solutions as per Table 5.3 PBP shall be met. The land does not appear to require significant 'native' vegetation modification or removal, as a result landscaping requirements are unlikely to have a negative effect on future DAs.

4.3 Water Supplies for Fire Fighting Purposes

Reticulated water supplies shall be constructed/provided pursuant to the acceptable solutions presented in Table 5.3c (PBP), including hydrant location, spacing, flows and pressure, required to comply with the relevant sections of AS 2419.1:2005.

4.4 Access

Access provisions shall incorporate both acceptable solutions and performance solutions. Whereby as a result of the sub-division of the existing land into min. 2ha lots the works further negate grassfires as the lots shall be dissected and managed around the curtilage of proposed structures.

As a result the proposed public roads presented herein, presented in relation to the three precincts are appropriate and capable of providing 'safe all-weather access to structures'. Additionally provisions for private roads to access the dwelling site and exit lots shall be provided pursuant to the acceptable solutions.

As depicted in Figure 5 to Figure 7, additional emergency (i.e. bushfire and flood) access and egress points are proposed. Nominating the provision to utilise public formed sealed road i.e. Barrett's Lane and unnamed crown road reserves and private lots for those roads to traverse during emergencies. The aim to provide enhanced use for operational and evacuation purposes and a higher level of redundancy. It is noted roads traversing via

privately held lots require a legally binding easements/covenant (i.e. s.88b instrument) to ensure ongoing management in perpetuity further negating residual risk.

In relation to battle-axe lots, additional redundancies are advised, erring on the side of caution enhanced access handle width i.e. min. 5.5m should be provisioned to ensure safe access and egress for firefighting vehicles while residents are evacuating.

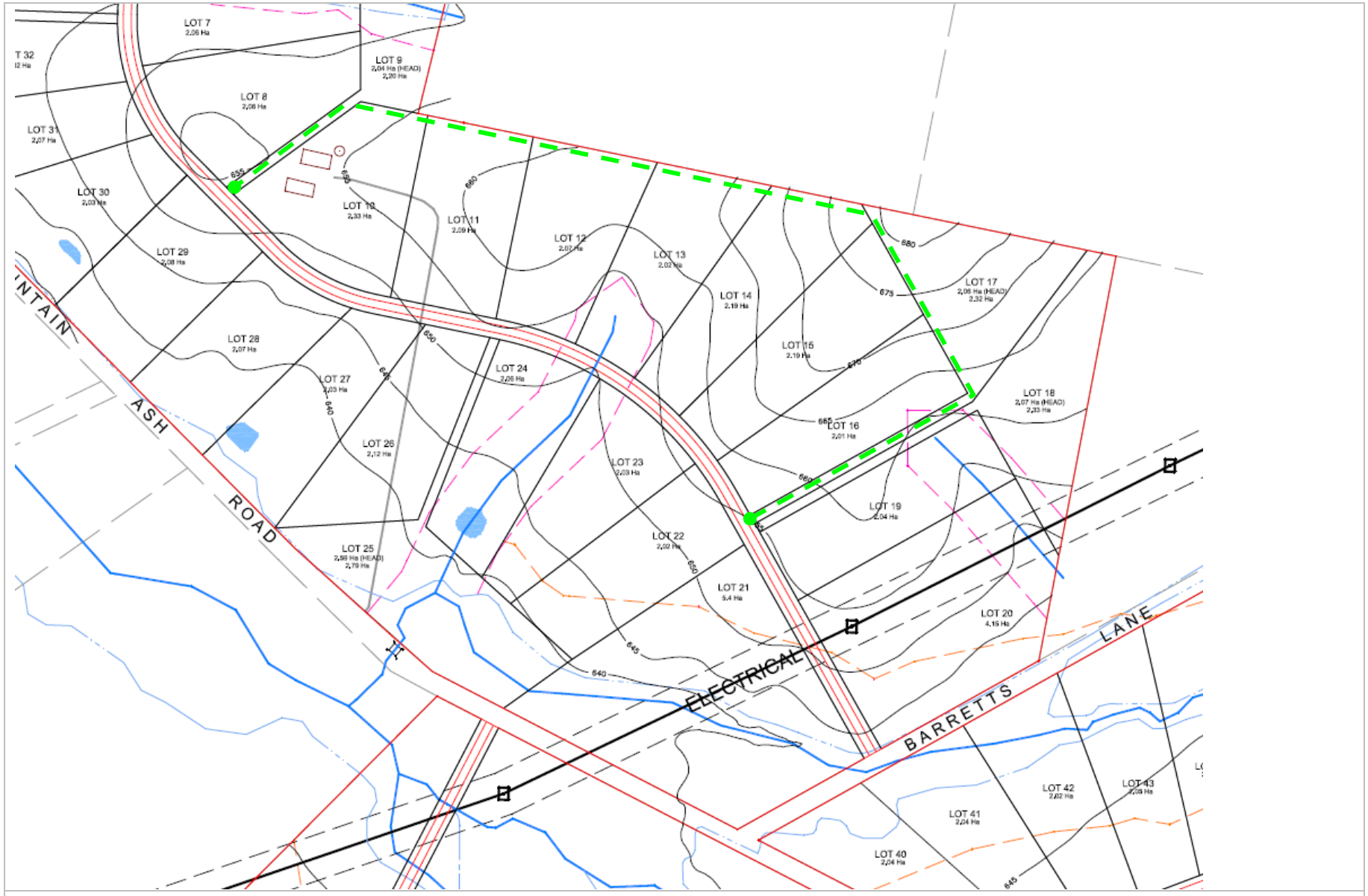


Figure 5: Precinct 1 – Emergency access via Lot 9 onto Lots 10 to 14 to Lot 17 traversing to &from the proposed internal road system.

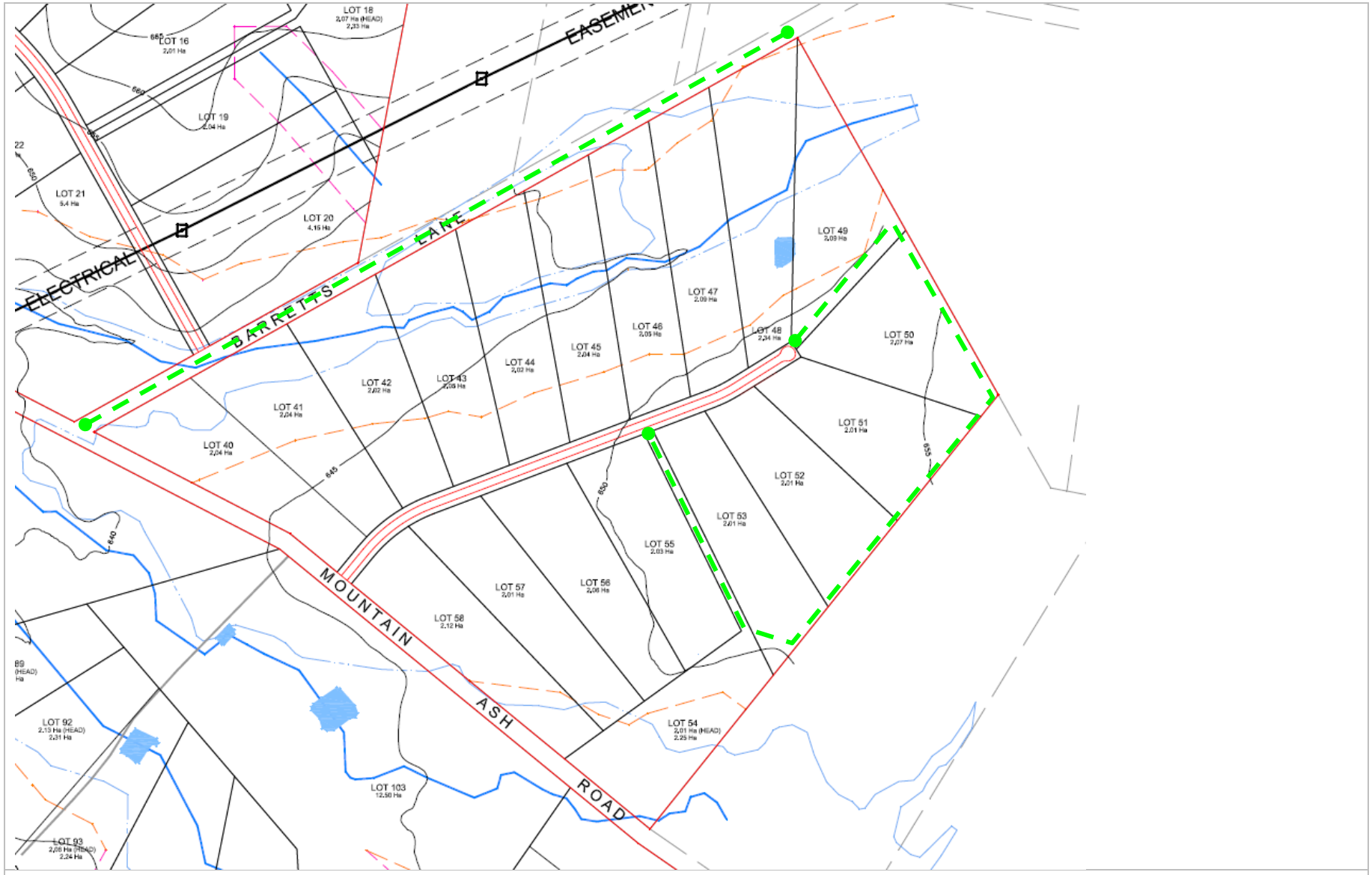


Figure 6: Precinct 2 - Emergency access via Barrett's Lane, a formed, sealed public road and private fire trail via Lot 49 to 54 tracking back onto the internal road system.

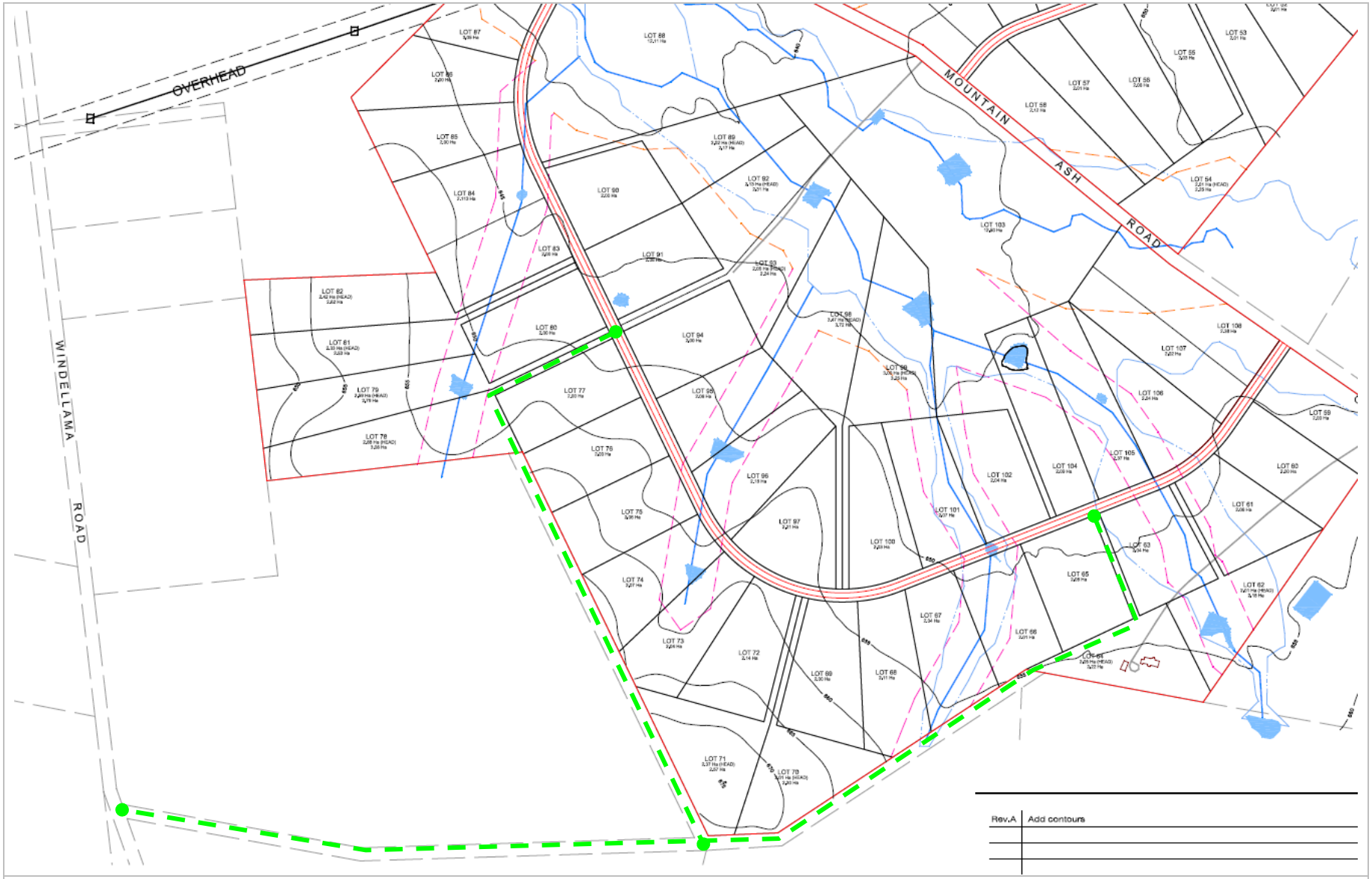


Figure 7: Precinct 3 – Provision for emergency access from Windellama Road via Unnamed Road reserves onto Lots 64 and 78 out to the proposed internal road system.

4.5 Electricity & Gas Services

Modifications to the electricity supply shall be constructed/provided pursuant to the acceptable solutions of s.5.3.3 (PBP). Underground power supplies should be prioritised, Reticulated gas is not proposed.

4.6 BAL Rating for Future Construction

The recommended BAL rating/s for the proposed development is able to comply with the acceptable solutions of PBP by achieving a BAL rating of 'BAL-29 or Lower' in accordance with the acceptable solutions set out in PBP.

The proposed sub-division layout has been designed to accommodate appropriate APZs to achieve a BAL rating that does not exceed BAL-29 (BAL to be confirmed at DA stage) thus complying with the acceptable solutions of PBP. Future development, however, is required to achieve the Deemed to Satisfy provisions of the NCC and further development on each lot i.e. construction of a 'Class 1a' dwelling, is subject to a *Development Application* as per s.4.14 EP&A Act or *Complying Development Application* as per the *State Environment Planning Code (SEPP) – Exempt and Complying Development*.

5 CONCLUSION

Through careful analysis of the Strategic Bushfire Strategy process in combination with sub-division layout and analysis processes. The level of risk and BPM's required to achieve compliance, as presented herein are able to achieve the requirements set out in s.4 and s.5 of PBP 2019.

The planning proposal to rezone the land in order to accommodate a 108 lot (2ha min.) rural-residential sub-division is deemed acceptable. The locality is acceptable whereby the surrounding locality is of an agricultural nature, the vegetation formation (hazard) is classified as grassland. As a result the area is considered low bushfire threat.

Grassland bushfires can move quickly therefore implementation of appropriate BPMs provide additional breaks in the landscape thus reducing the consequences of bushfire to the community than currently existing. Additional road networks and exist routes with managed rural residential areas, with APZ, swimming pools and managed gardens and appropriately managed landscaping requirements will assist in limiting extensive, fast moving grassfires through the landscape.

The analysis, discussions and the proposed planning layout presented herein, aim to assist the client in consulting with Council and NSW RFS in determining the adoption of the planning proposal presented herein.

Having considered the planning principles at the strategic and sub-division level, it is in my professional opinion the planning proposal is suitable for adoption and the rezoning of the existing rural land (subject site) is compatible with the requirements set out in PBP (2019).

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APPENDIX A – SITE PLANS

Plans by: Site Layout Plan By: Stuart Design; 04-05-2022.

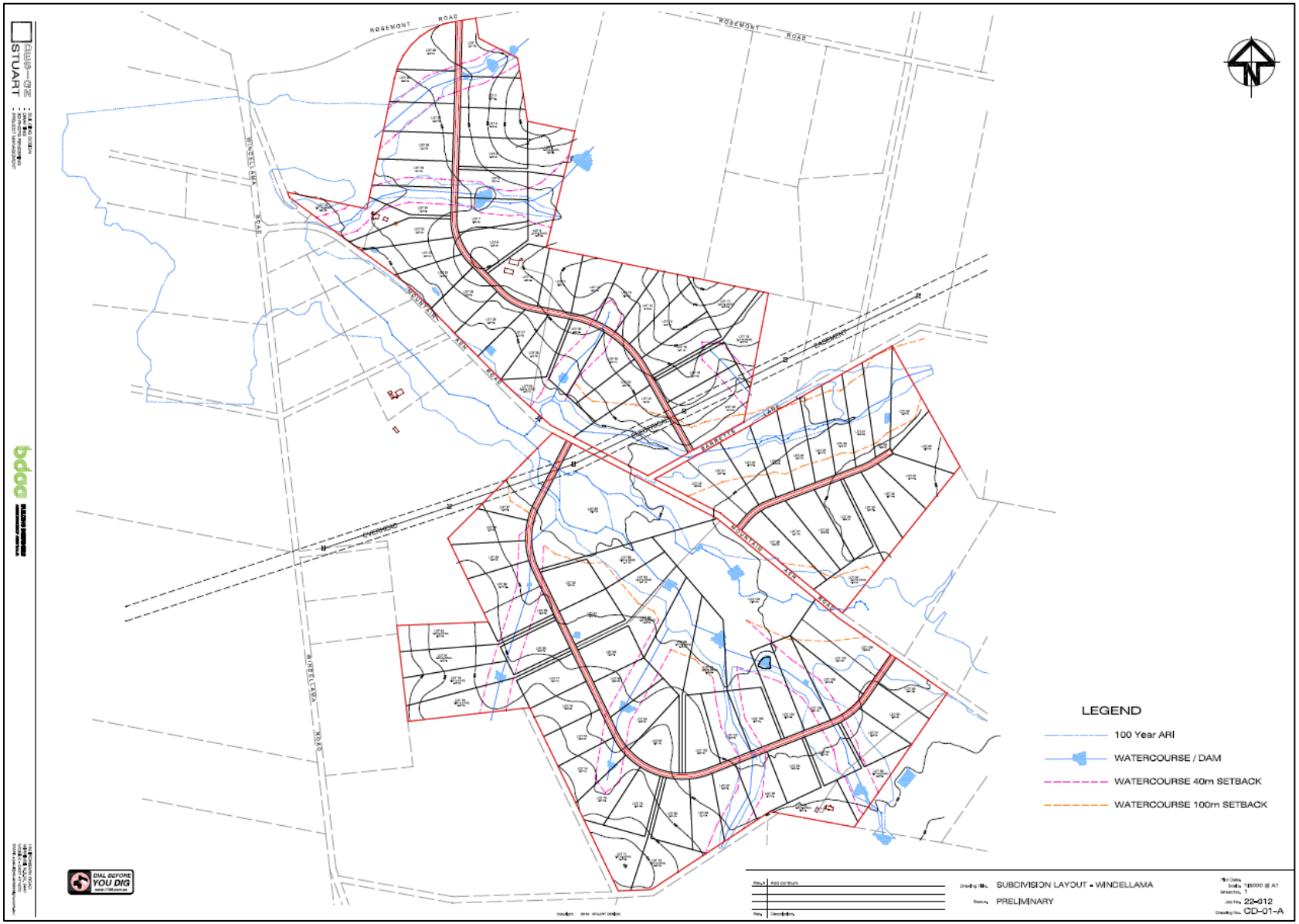


Figure A 1: Site overview – sub-division layout

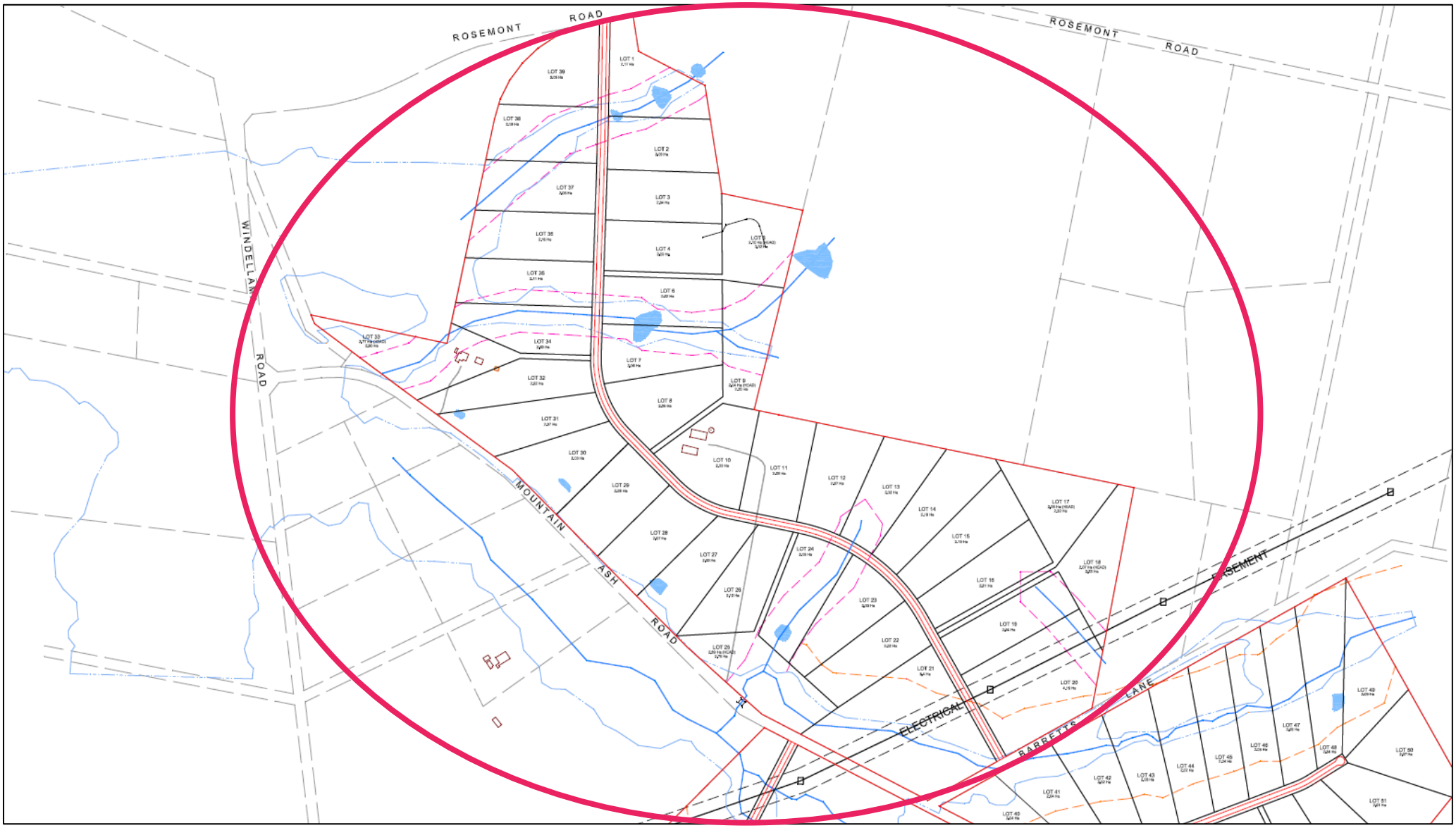


Figure A 2: Windellama Precinct 1

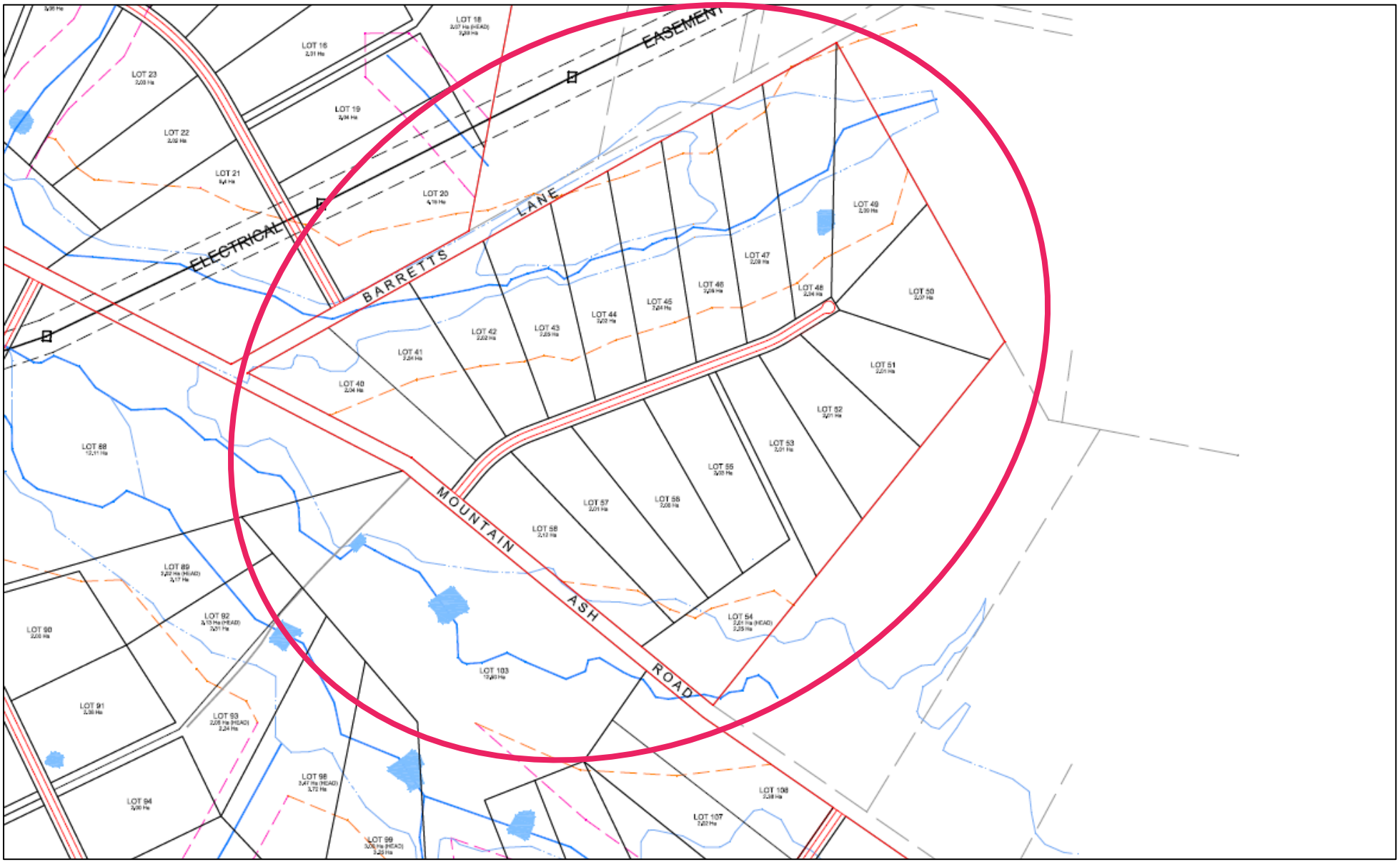


Figure A 3: Windellama Precinct 2

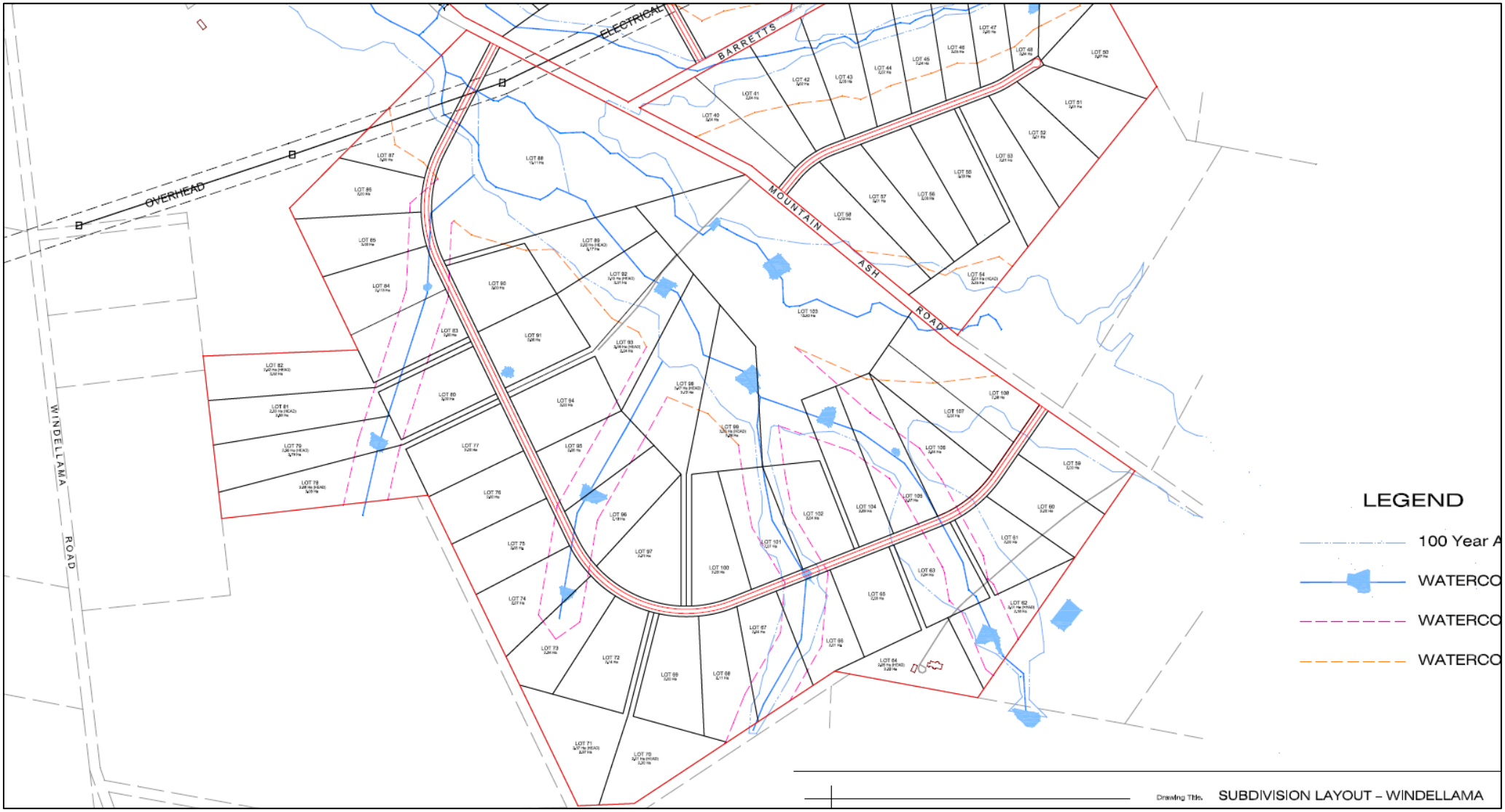


Figure A 4: Windellama Precinct 3

APPENDIX B – RFS GUIDELINES & FAST FACTS

APPENDIX 3

ACCESS

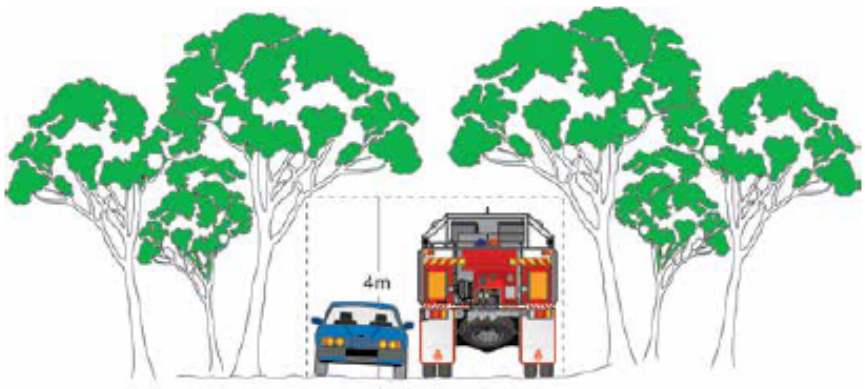
This appendix provides design principles for emergency service vehicle access.

A3.1 Vertical clearance

An unobstructed clearance height of 4 metres should be maintained above all access ways including clearance from building construction, archways, gateways and overhanging structures (e.g. ducts, pipes, sprinklers, walkways, signs and beams). This also applies to vegetation overhanging roads.

Figure A3.1

Vertical clearance.



A3.2 Vehicle turning requirements

Curved carriageways should be constructed using the minimum swept path as outlined in Table A3.2.

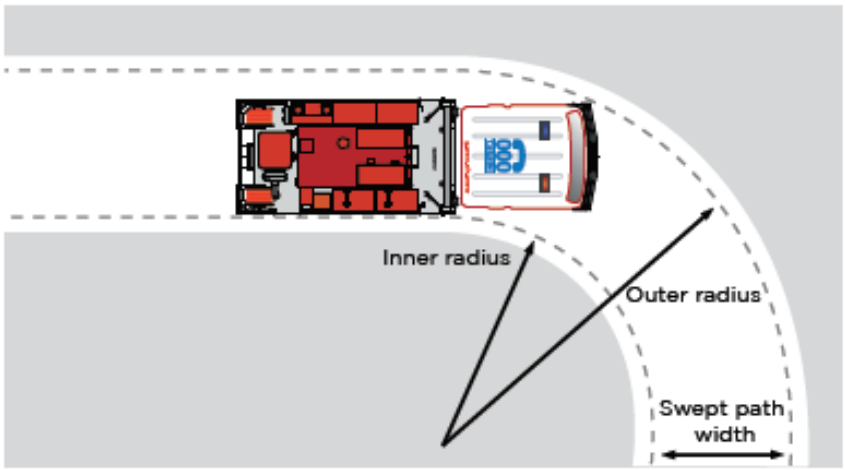
Table A3.2

Minimum curve radius for turning vehicles.

Curve radius (inside edge in metres)	Swept path (metres width)
< 40	4.0
40 - 69	3.0
70 - 100	2.7
> 100	2.5

Figure A3.2a

Swept path width for turning vehicles.



The radius dimensions given are for wall to wall clearance where body overhangs travel a wider arc than the wheel tracks (vehicle swept path). The swept path shall include an additional 500mm clearance either side of the vehicle.

Figure A3.2b

Roundabout swept path.

Example of a swept path as applied to a roundabout. The distance between inner and outer turning arcs allows for expected vehicle body swing of front and rear overhanging sections (the swept path).

A3.3 Vehicle turning head requirements

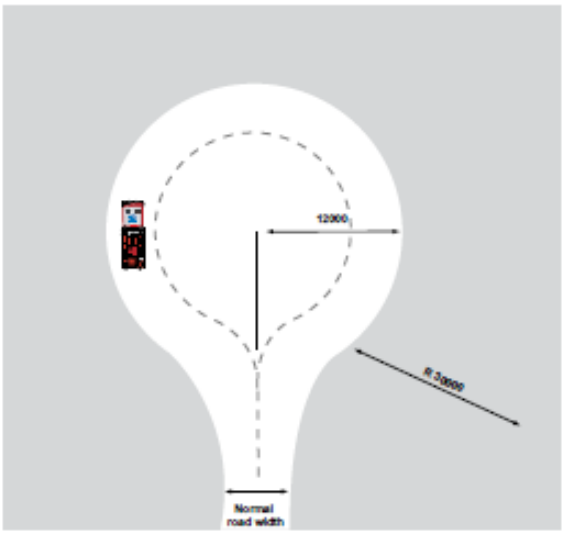
Dead ends that are longer then 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

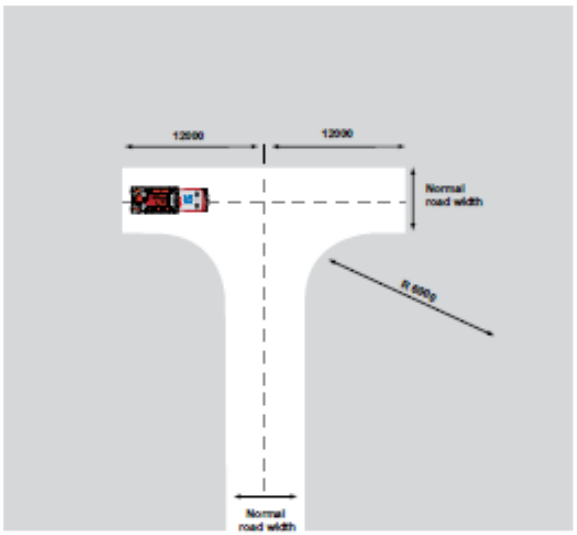
Figure A3.3

Multipoint turning options.

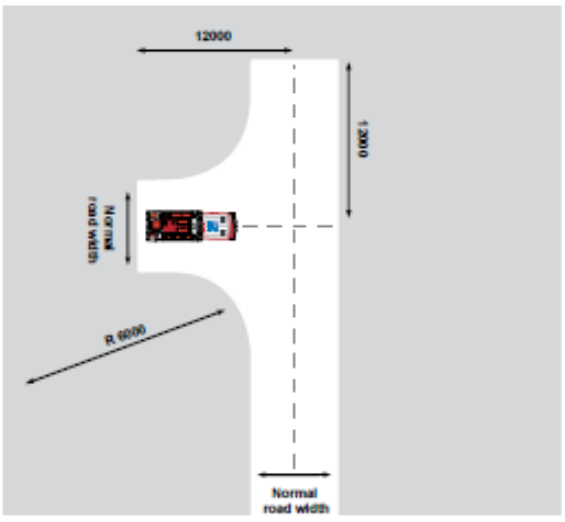
Type A



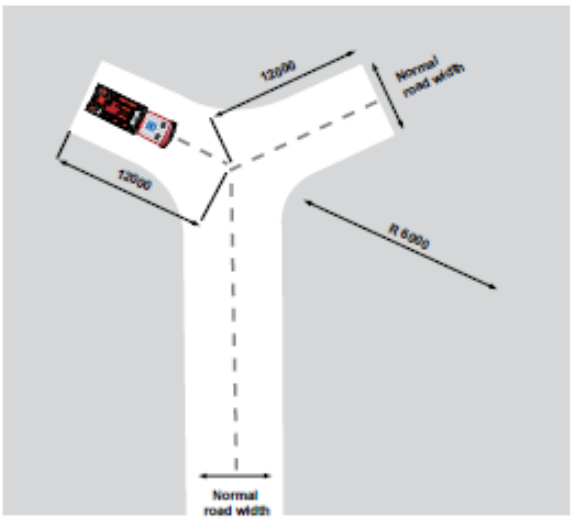
Type B



Type C



Type D



A3.4 Passing bays

The construction of passing bays, where required, shall be 20m in length and provide a minimum trafficable width at the passing point of 6m.

Figure A3.4

Passing bays can provide advantages when designed correctly. Poor design can and does severely impede access.

A3.5 Parking

Parking can create a pinch point in required access. The location of parking should be carefully considered to ensure fire appliance access is unimpeded. Hydrants shall be located outside of access ways and any parking areas to ensure that access is available at all times.

Figure A3.5

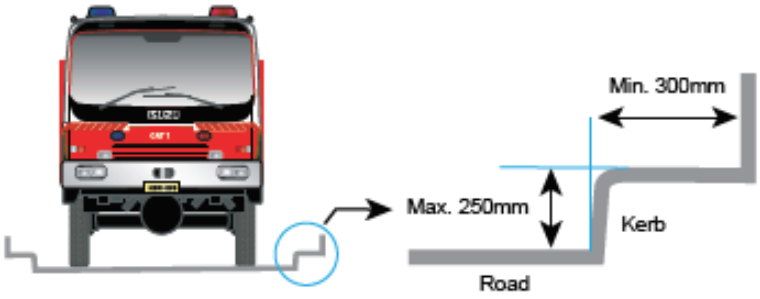
Hydrants and parking bays.

A3.6 Kerb dimensions

All kerbs constructed around access roads should be no higher than 250mm and free of vertical obstructions at least 300mm back from the kerb face to allow clearance for front and rear body overhang.

Figure A3.6

Carriageway kerb clearance dimensions.



A3.7 Services

Hydrant services should be located outside the carriageway and parking bays to permit traffic flow and access. Setup of standpipes within the carriageway may stop traffic flow. Hydrant services shall be located on the side of the road away from the bush fire threat where possible.

A3.8 Local Area Traffic Management (LATM)

The objective of LATM is to regulate traffic an acceptable level of speed and traffic volume within a local area.

Traffic engineers and planners should consider LATM devices when planning for local traffic control and their likely impact on emergency services. LATM devices by their nature are designed to restrict and impede the movement of traffic, especially large vehicles.

Where LATM devices are provided they are to be designed so that they do not impede fire vehicle access.

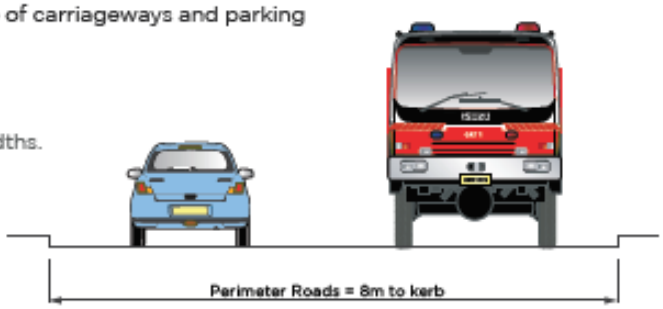
A3.9 Road types

A3.9.1 Perimeter Roads

Perimeter roads are to be provided with a minimum clear width of 8m. Parking and hydrants are to be provided outside of carriageways. Hydrants are to be located outside of carriageways and parking areas.

Figure A3.9a

Perimeter road widths.

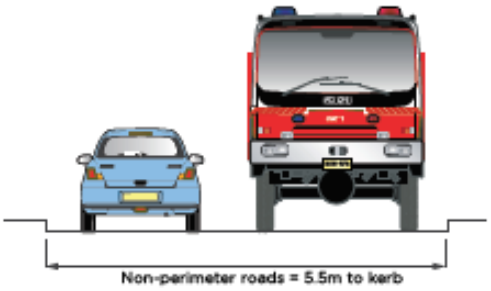


A3.9.2 Non-perimeter Roads

Non-perimeter roads shall be provided with a minimum clear width of 5.5m. Parking is to be provided outside of the carriageway and hydrants are not to be located in carriageways or parking areas.

Figure A3.9b

Non-perimeter road widths.



A3.9.3 Property access

Property access roads are to be a minimum of 4m wide.

Figure A3.9c

Property access road widths.

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- 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 should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

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

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

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

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

Figure A4.1

Typical Inner and Outer Protection Areas.