Bushfire Protection Assessment

Proposed Subdivision: Jordan Springs Stage 3C

Prepared for
ADW Johnson Pty Ltd

22 May 2019

DOCUMENT TRACKING

Item	Detail
Project Name	Bushfire Protection Assessment – Proposed Subdivision Jordan Springs Stage 3C
Project Number	18SUT_10709
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Status	Final
Version Number	V1
Last saved on	22 May 2019

This report should be cited as '*Eco Logical Australia May 2019. Bushfire Protection Assessment - Proposed subdivision Jordan Springs Stage 3C*

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd.

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1 Property and proposal

Table 1: Subject site summary

Street or property Name:	Jordan Springs, Stage 3C		
Suburb, town or locality:	Jordan Springs	**Postcode:**	2747
Local Government Area:	Penrith City Council		
Type of development:	Residential subdivision		

1.1 Description of proposal

The proposal is for the residential subdivision of 60 residential lots and associated public roads as depicted in **Figure 1**.

1.2 Assessment process

The proposal was assessed in accord with Section 100B of the *Rural Fires Act 1997* and 'Planning for Bush Fire Protection 2006' (RFS 2006), herein referred to as PBP (See **Appendix A** for a summary of the assessment process).

The bushfire protection requirements for residential subdivision throughout the Central Precinct have been previously determined and approved at the Precinct Plan stage as described within the report '*Bushfire Protection Assessment – St Marys Western and Central Precincts'* prepared by BES (2009).

This assessment relates to the Eastern Precinct but also follows, and builds upon, the findings and principles of the initial bushfire report and included a review of background information, GIS analysis and design team consultation.

Table 2 identifies the bushfire protection measures assessed and whether these involved acceptable or performance solutions.

Table 2: Summary of bushfire protection measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	☑	☐	3.1
Construction standard	☑	☐	3.3
Access	☑	☐	3.4
Water supply	☑	☐	3.5
Gas and electrical supplies	☑	☐	3.5

1.3 Bush fire prone land status

The subdivision includes land classified as bush fire prone on the Penrith's City Council bush fire prone land (BFPL) map[1].

[1] https://www.planningportal.nsw.gov.au/find-a-property

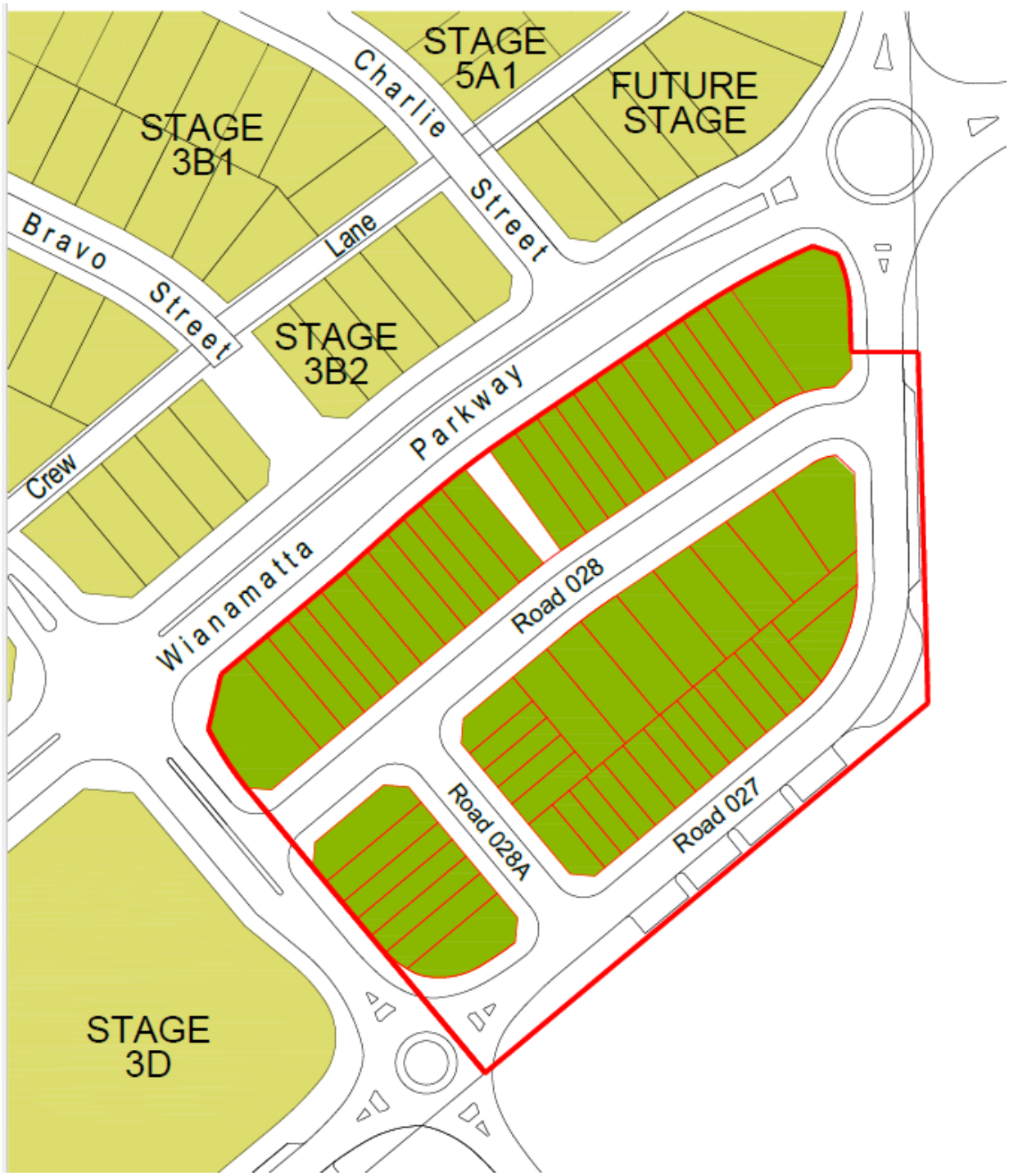

Figure 1: Subdivision layout

2 Bushfire threat assessment

Figure 2 shows the effective slope and predominant vegetation on transect lines representing the highest bushfire threat potentially posed to the subdivision from various directions.

The effective slope has been determined from 2 m contour data (LPI contours).

The predominant vegetation has been determined through previous site assessments within the Jordan Springs Masterplan (formerly known as the *Central Precinct Masterplan*).

Land cleared for development (including some isolated strands of remnant woodland trees) in the form of future Regional Open Space areas, lies to the east and south of Stage 3C. The future Regional Open Space in this location is regularly slashed by Lendlease as part of maintenance and fire mitigation across the site. The consistent nature of current management means it is unlikely for a potential grassland / remnant woodland hazard to eventuate. Should current management cease or be reduced, then additional mitigation measures (asset protection zones [APZ]) may be required, particularly prior to the formal construction of future sporting fields and passive open space areas.

The assessment also adopts similar recommendations to those approved within the Precinct Plan relating to bushfire protection described within the report '*Bushfire Protection Assessment – St Marys Western and Central Precincts'* prepared by BES (2009).

Figure 2 and **Table 3** show the vegetation and slope information assessed. Where required additional information is provided within **Table 3** on why and how the chosen slope and vegetation has been calculated.

The site is located within the Local Government Area (LGA) of Penrith City Council and has a Fire Danger Index (FDI) of 100.

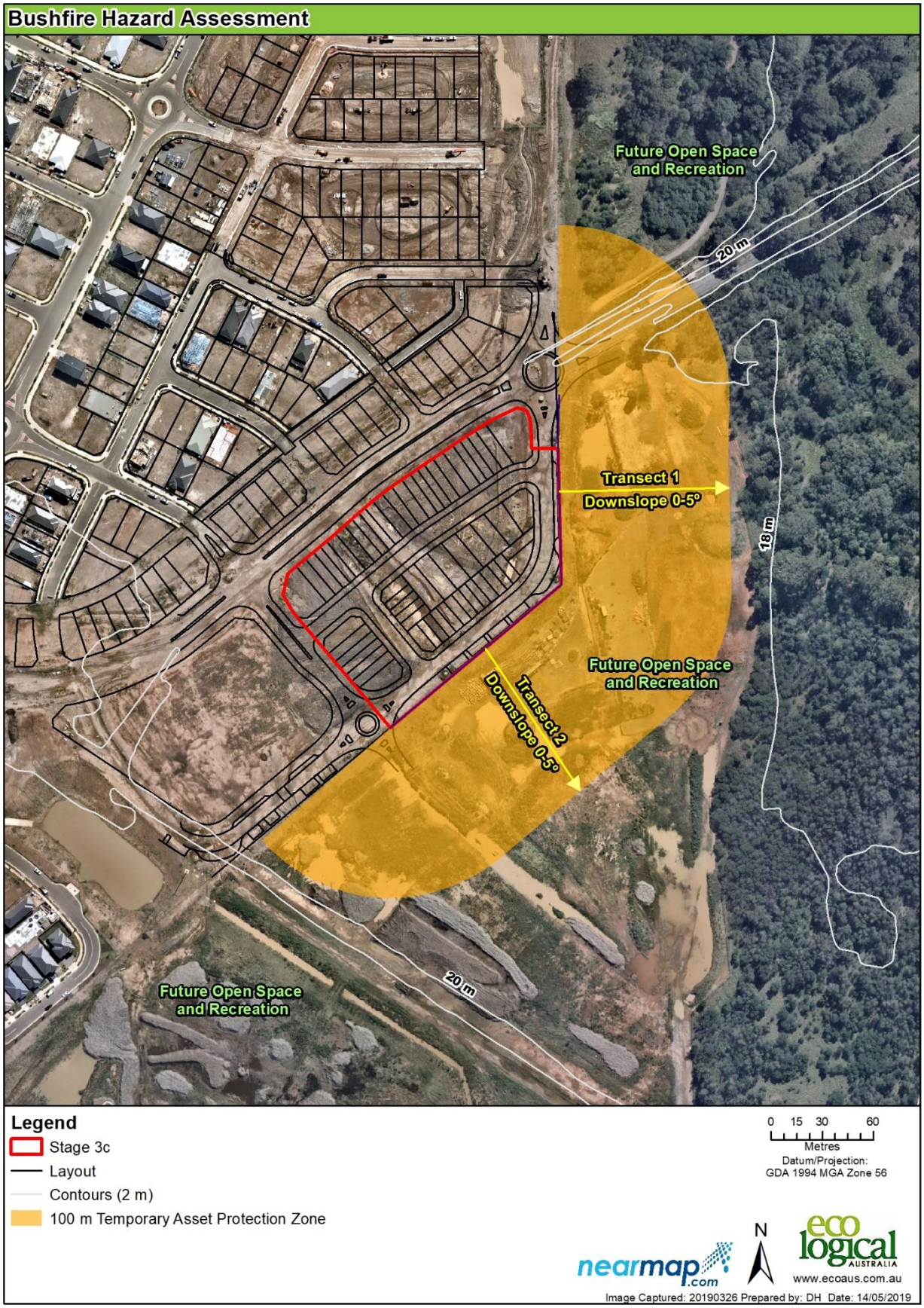

Figure 2: Bushfire hazard assessment and Asset Protection Zones (APZ)

3 Bushfire protection measures

3.1 Asset Protection Zones (APZ)

Table 3 shows the dimensions of the APZ required in each of the transect line directions; and where relevant, information on how the APZ is to be provided is included. The footprint of the required APZ is also shown in **Figure 2**.

The temporary APZ is required between the hazard to the east and south and any development. This APZ is part of a staged development. The APZ can be automatically extinguished once the land on the east and south is developed as future Regional Open Space and hazard is permanently removed.

3.2 APZ maintenance plan

Where the APZ is to be established it is to be managed to Inner Protection Area standards as follows:

- No tree or tree canopy is to occur within 2 m of the future building rooflines;
- The presence of a few shrubs or trees in the APZ is acceptable provided they:
  - Are well spread out and do not form a continuous canopy;
  - Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
  - Are located far enough away from the building so that they will not ignite future buildings by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter); and
- Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

Further details on APZ implementation and management can be found on the NSW RFS website including:

https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf.

Table 3: Bushfire hazard assessment and APZ requirements

Lot # OR direction from development boundary	Transect #	Slope	Vegetation	PBP required APZ (PBP 2006)	BAL-29 required APZ (AS 3959-2009)	Proposed APZ	Comments
Eastern & Southern Boundary	1 & 2	Downslope >0 to 5 degrees	Managed Land (Future Regional Open Space)	N/A	N/A	≥100 m	Land will be managed as part of current site maintenance and will be developed in future as formal open space / recreation areas. Should current management be reduced a 'Temporary APZ' (until the formal open space is created) to a distance of at least 100 m may be established within the future open space areas. This would ensure that APZ or construction standards are not required for new dwellings within Stage 3C adjacent to this boundary.

3.3 Construction standard

The Bushfire Attack Level (BAL) for future dwellings within the proposed subdivision will be determined at the individual dwelling Complying Development Certificate (CDC) or Development Application (DA) stage, however, a maximum of BAL-LOW is provided by the subdivision design using AS 3959-2009 fuel loads.

Penrith City Council has requested that the Bushfire Attack Levels (BALs) under *AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959-2009) be issued at time of subdivision application.

Stage 3C adjoins a temporary APZ to the east and south of at least 100 m (**Figure 2**) to ensure bushfire construction specifications are not required for dwellings within this stage. The 100 m temporary APZ within the undeveloped Regional Open Space provides a maximum BAL rating of BAL-LOW to any dwelling within Stage 3C. BAL-LOW is based on insufficient risk to warrant specific bushfire construction standards.

3.4 Access

The subdivision will be accessed by Wianamatta Parkway and existing perimeter roads on the north and west via future stages of the Eastern Precinct. The proposed public road layout within the subdivision and its linkages to existing and future surrounding roads complies with PBP.

Figure 1 and **Figure 2** show the internal and perimeter access within the subdivision. It shows the following types of access:

- Perimeter public road; and
- Internal public road;

The performance criteria and acceptable solutions for each of these access types are shown in **Appendix B**, along with comment on the subdivision design compliance or otherwise. All access within the subdivision meets the acceptable solutions within PBP,

3.5 Services – Water, electricity and gas

3.5.1 Water

The proposal will be serviced by a reticulated water supply. **Table 4** identifies the acceptable solution requirements of Section 4.1.3 of PBP for which the proposal is compliant with, subject to the following specifications:

Table 4: Performance criteria for reticulated water supplies (PBP page 27)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
• water supplies are easily accessible and located at regular intervals	• reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. • fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and	Can comply Can comply

Performance Criteria	Acceptable Solutions	Complies
	sizing of hydrants shall be determined using fire engineering principles.	
	• hydrants are not located within any road carriageway	Can comply
	• all above ground water and gas service pipes external to the building are metal, including and up to any taps.	Can comply
	• the provisions of parking on public roads are met.	Can comply

3.5.2 Electricity services

Electricity supply to / within the subject land is located underground and therefore complies with Section 4.1.3 of PBP.

3.5.3 Gas services

Gas services (reticulated or bottle gas) are compliant with Section 4.1.3 of PBP, subject to the following specifications:

- Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 *The storage and handling of LP Gas* (SA 2014). Metal piping is to be used;
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation;
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal; and
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

4 Assessment of environmental issues

An assessment of significant environmental features, threatened species or Aboriginal relics identified under the *Biodiversity Conservation Act 2016* or the *National Parks Act 1974* that will affect or be affected by the bushfire protection proposals in this report has not been undertaken as it is covered by other parts of the DA process. However, site impacts have been minimised by carefully selected bushfire protection measures. The impact footprint of these measures e.g. APZ is clearly identified within this report and therefore capable of being clearly assessed by suitably qualified persons as required.

Penrith City Council is the determining authority for this development; they will assess more thoroughly any potential environmental and heritage issues.

5 Conclusion

The proposed subdivision complies with either the acceptable or performance solutions within 'Planning for Bush Fire Protection 2006', (see **Table 2**). All performance solutions used are substantiated within the section of this assessment identified in **Table 5**.

Table 5: Summary of bushfire protection measures assessed

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	☑	APZ dimensions are detailed in **Table 3** and **Figure 2**.	☑	☐	3.1
APZ Maintenance plan	☑	Identified temporary APZ to be maintained to the detailed specifications in **Section 3.2**.	☑	☐	3.2
Construction standard	☑	BAL for dwellings to be determined at individual CDC/DA stage however, a maximum of BAL-LOW is achievable.	☑	☐	3.3
Access	☑	Access to meet standards detailed in **Table 6**.	☑	☐	3.4
Water supply	☑	Reticulated water supply to meet PBP acceptable solution specifications for a subdivision.	☑	☐	3.5.1
Electricity service	☑	Electricity supply located underground.	☑	☐	3.5.2
Gas service	☑	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	☑	☐	3.5.3

6 Recommendations

It is recommended that the subdivision be issued a Bush Fire Safety Authority.

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7 References

Bushfire and Environmental Services (2009) '*Bushfire Protection Assessment – St Marys Western and Central Precincts'*

Industry Safety Steering Committee 3 (ISSC3). 2016. *ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets*. November 2016. NSW.

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

NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* including the 2010 Appendix 3 Addendum. Australian Government Publishing Service, Canberra.

Standards Australia (SA). 2009. *Construction of buildings in bushfire-prone areas (including Amendments 1 – 3)*, AS 3959-2009. SAI Global, Sydney.

Standards Australia (SA). 2014. *The storage and handling of LP Gas*, AS/NZS 1596:2014. SAI Global, Sydney.

Standards Australia (SA). 2017. *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, Fifth edition 2017, SAI Global, Sydney.

Appendix A – Assessment process

Vegetation types

In accord with PBP the predominant vegetation class has been assessed for a distance of at least 140 m from the subject land in all directions.

Effective slope

In accord with PBP, the slope that would most significantly influence fire behaviour was determined over a distance of 100 m from the boundary of the proposed development where the vegetation was found.

Asset Protection Zone determination

Table A2.4 of PBP has been used to determine the width of required Asset Protection Zone (APZ) for the proposed development using the vegetation and slope data identified in **Section 2**.

Appendix B – Access specifications

Table 6: Performance criteria for proposed public roads (PBP page 21)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
• firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)	• public roads are two-wheel drive, all weather roads	Can comply
• public road widths and design that allows safe access for firefighters while residents are evacuating an area	• urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle)	Can comply
	• the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	Can comply
	• traffic management devices are constructed to facilitate access by emergency services vehicles	Can comply
	• public roads have a cross fall not exceeding 3 degrees	Can comply
	• public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends 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 and direct traffic away from the hazard	Can comply
	• curves of roads (other than perimeter roads) are a minimum inner radius of six metres	Can comply
	• 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	Can comply
	• there is a minimum vertical clearance to a height of four metres above the road at all times	Can comply
• the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles	• the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating	Can comply

Performance Criteria	Acceptable Solutions	Complies
• roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered	• public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression • public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression	Can comply
• there is clear access to reticulated water supply	• public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression • one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	Can comply
• parking does not obstruct the minimum paved width	• parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement . No services or hydrants are located within the parking bays • public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	Can comply

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