Bushfire Protection Assessment

Proposed residential subdivision and construction of 43 townhouses

54 Terry Road, Rouse Hill

10 February 2020

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

DOCUMENT TRACKING

Item	Detail
Project Name	Bushfire Protection Assessment: Proposed residential subdivision and construction of 43 townhouses - 54 Terry Road, Rouse Hill
Project Number	18SYD_10387
Client Name	Prisma Rouse Hill Development Pty Ltd
Project Manager	Rebecca Ben-Haim Suite 1, Level 1, 101 Sussex St, Sydney NSW 2000 Phone: 02 8536 8650
Prepared by	Natalie South
Reviewed by	Bruce Horkings
Approved by	Rod Rose FPAA BPAD L3 Certified Practitioner No. BPAD1940-L3
Status	Final
Version Number	9
Last saved on	10 February 2020

This report should be cited as 'Eco Logical Australia February 2020. *Bushfire Protection Assessment: Proposed* residential *subdivision and construction of 43 townhouses - 54 Terry Road, Rouse Hill*'.

Contents

List of figures

List of tables

1 Property and proposal

Table 1: Subject site summary

Street address or property name:	54 Terry Road		
Suburb, town or locality:	Rouse Hill	**Postcode:**	2155
Lot/DP no:	Lot 132 DP 208203		
Local Government Area:	Blacktown City Council		
Zoning:	R3 Medium Density Residential, RE1 Public Recreation and SP2 Infrastructure		
Type of development:	Residential subdivision		

1.1 Description of proposal

The proposal is for subdivision of 1 lot into 44 lots and the construction of 43 townhouses (See **Figure 1**).

The subdivision will consist of 43 residential lots, 1 bushland/recreation lot and associated roads and infrastructure.

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 2006 (See **Appendix A** for a summary of the assessment process).

Additionally, a performance-based solution was developed using Planning for Bush Fire Protection 2019 (PBP 2019) to determine the Asset Protection Zones (APZ) and Bushfire Attack Level (BAL).

Assessment included a review of background documentation, design team consultation and GIS analysis.

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

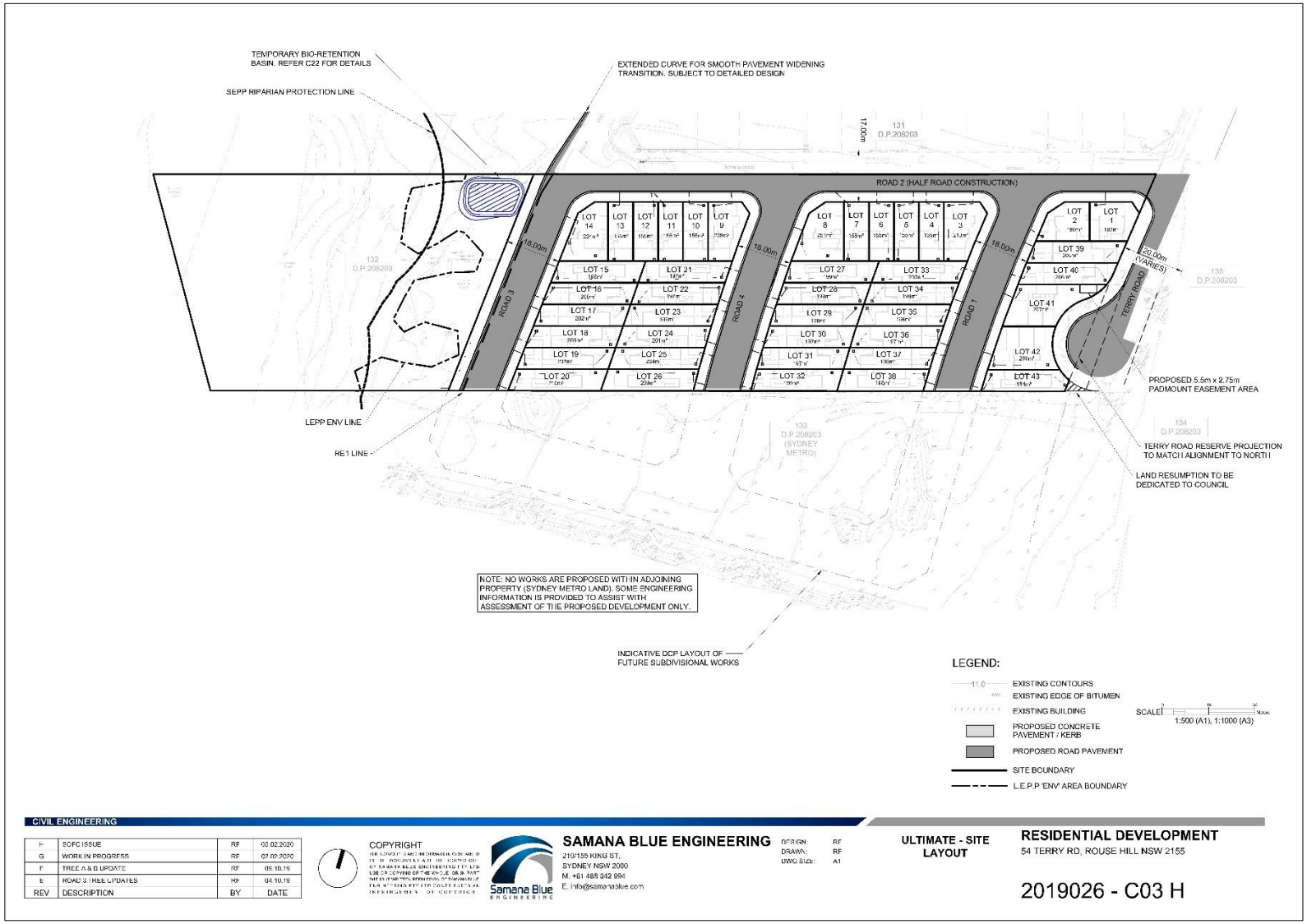


Figure 1: Subdivision layout

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. The predominant vegetation has been determined from the Keith (2004) vegetation maps.

Figure 2 shows the predominant vegetation affecting the proposed subdivision is a riparian corridor running through the west of the subject land along Second Ponds Creek. This vegetation is greater than 50 m in width and classified as 'Forested Wetland' under PBP 2019 and located on slopes categorised as '>0-5 degrees downslope'.

Figure 2 shows an area of proposed Lot 44 will be dedicated 'recreation'. This area will be managed to Inner Protection Area standards and is not considered a hazard for the purposes of this assessment.

The land adjoining the subject site directly north is an approved 26 lot Torrens Title subdivision (DA-16-03564). Adjoining to the south is a Torrens Title subdivision already under construction consisting of further residential allotments and further road infrastructure. Both lands to the north and south have been considered as managed land for the purposes of this report.

To the east of the subject land there are managed lands in the form of existing rural properties, Terry Road carriageway and a caravan park.

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 Blacktown 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 Asset Protection Zones (APZ) 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** and as shown no portion of the APZ is required to extend onto the RE1 lands.

The proposed APZ dimensions have been determined by using a performance solution that achieves the 29 kW/m^2 approval threshold. This has been determined by selecting the applicable APZ for forested wetland from Table A1.12.2 of PBP 2019 and is shown in **Figure 2**. By applying the APZ dimensions from PBP 2019, the proposed APZ achieves <29 kW/m^2 based on the amended NSW fuel loads.

3.2 APZ maintenance plan

As shown in **Figure 2**, the identified APZ 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 2019)	Proposed APZ	Bushfire Attack Level (BAL) (PBP 2019)	Comments
West	1	Downslope >0 to 5 degrees	Forested Wetland	12 m	≥12 m	BAL-29 (12-<18 m) BAL-19 (18-<26 m) BAL-12.5 (26-<100 m) BAL-LOW (>100 m)	Minimum APZ achievable within boundaries of subject land, provided by road reserves and building setbacks.

3.3 Construction standard

The building construction required for the townhouses is based on the determination of the Bushfire Attack Level (BAL) in accordance with Table A1.12.5 of PBP 2019. The BAL is based on known vegetation type, effective slope and separation distance between the development and the bushfire hazard.

As shown within **Table 1** and **Figure 3**, the development is capable of being constructed to comply with the following construction standards:

- Lot 14: Townhouse to be constructed to BAL-29 for the entire roof, northern and western elevations and BAL-19 for the southern and eastern elevations;
- Lot 13: Townhouse to be constructed to BAL-19 for the entire roof, northern and western elevations and BAL-12.5 for the southern and eastern elevations; Lots 15-20: Townhouse to be constructed to BAL-29 for the entire roof and western elevations and BAL-19 for the northern, eastern and southern elevations;
- Lots 7-12, 21-32: Entire townhouses are to be constructed to **BAL-12.5**; and
- Lots 1-6 and, Lots 33-43: **BAL-LOW** - no specific bushfire construction standards apply.

Construction is to comply with the current version of AS 3959-2009 (SA 2009) and the additional ember protection provisions identified in Section 7.5 of PBP 2019, as required.

3.4 Access

Figure 1 and **Figure 2** show the proposed access within the subdivision, performance criteria and acceptable solutions 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.

Public road access to the subdivision is via Terry Road, a single entry point (**Figure 1**). This is temporary until land to the south has been developed as per the Blacktown City Council Development Control Plan (DCP).

The proposed temporary dead end roads within the subdivision are less than 200 m in length but require temporary turning areas to comply with PBP as per the specifications in **Table 6** until development of the land to the south under the DCP.

A perimeter road is proposed for the subdivision however is temporarily a dead road until development of the land to south. This road will also require a temporary turning area to comply with PBP as per specifications in **Table 6**.

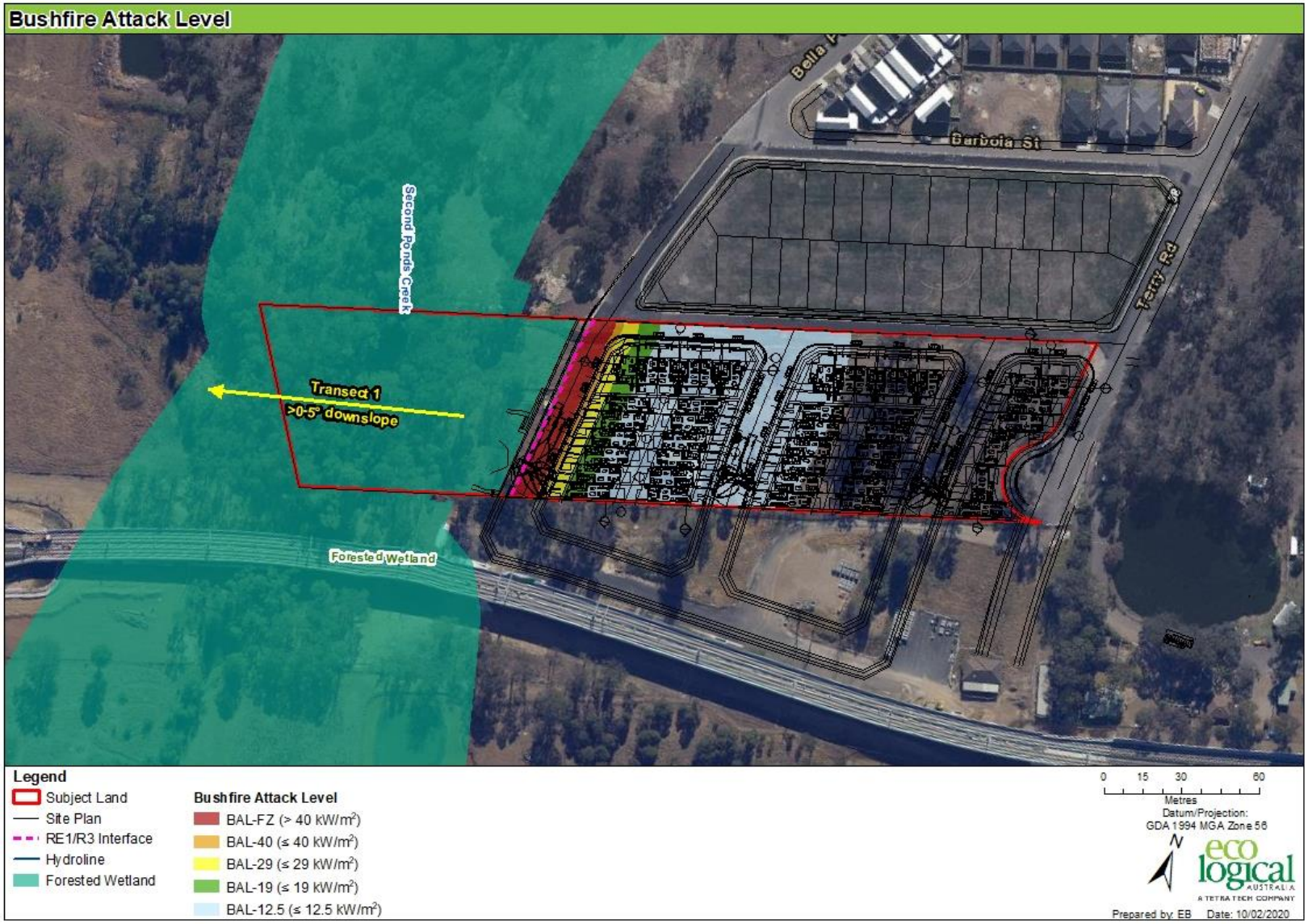


Figure 3: Bushfire Attack Level (BAL)

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.	Can comply
	• 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 sizing of hydrants shall be determined using fire engineering principles.	Can comply
	• 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

A Flora and Fauna Assessment has been prepared in support of the proposed development (18SYD_10387 February 2020) containing recommendations to mitigate potential impacts from the proposed development. Site impacts have been minimised by carefully selected bushfire protection measures. If required, 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.

Blacktown 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**.

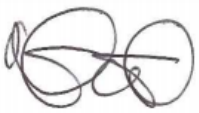
Table 5: Summary of bushfire protection measures assessed

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 APZ to be maintained in perpetuity to the detailed specifications in **Section 3.2**.	☑	☐	3.2
Construction standard	☑	The building construction determined in accordance with PBP 2019 with a maximum of BAL-29 achieved. BAL detailed in **Section 3.3**.	☐	☑	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 and the 43 townhouses be approved with a BAL rating as follows:

- Lot 14: Townhouse to be constructed to BAL-29 for the entire roof, northern and western elevations and BAL-19 for the southern and eastern elevations;
- Lot 13: Townhouse to be constructed to BAL-19 for the entire roof, northern and western elevations and BAL-12.5 for the southern and eastern elevations; Lots 15-20: Townhouse to be constructed to BAL-29 for the entire roof and western elevations and BAL-19 for the northern, eastern and southern elevations;
- Lots 7-12, 21-32: Entire townhouses are to be constructed to **BAL-12.5**; and
- Lots 1-6 and, Lots 33-43: **BAL-LOW** - no specific bushfire construction standards apply.



Natalie South
Bushfire Technical Assistant

Rod Rose
Senior Principal Bushfire Consultant
FPAA BPAD L3 Certified Practitioner No. BPAD1940-L3

7 References

Eco Logical Australia (ELA) 2020. *Flora and Fauna Report, Residential Subdivision of 54 Terry Road, Rouse Hill. February 2020.*

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.

NSW Rural Fire Service (RFS). 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and developers*. Australian Government Publishing Service, Canberra. December 2019.

Standards Australia (SA). 2018. *Construction of buildings in bushfire-prone areas*, AS 3959-2018. 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, Eighth edition, 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 A1.12.2 (FDI 100) of PBP 2019 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	Complies
• 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)	Complies (see temporary measures in Section 3.4)
	• the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	Complies
	• traffic management devices are constructed to facilitate access by emergency services vehicles	Can comply
	• public roads have a cross fall not exceeding 3 degrees	Complies
	• 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 (see temporary measures in Section 3.4)
	• 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	Can comply
	• 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	Can comply
	• 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	Not applicable
• 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	Can comply
	• public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	Can comply

ecological AUSTRALIA

HEAD OFFICE
Suite 2, Level 3
668-672 Old Princes Highway
Sutherland NSW 2232
T 02 8536 8600

SYDNEY
Level 3, 101 Sussex Street
Sydney NSW 2000
T 02 9259 3800

HUSKISSON
Unit 1, 51 Owen Street
Huskisson NSW 2540
T 02 4201 2264

CANBERRA
Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145

NEWCASTLE
Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125

NAROOMA
5/20 Canty Street
Narooma NSW 2546
T 02 4302 1266

COFFS HARBOUR
22 Ray McCarthy Drive
Coffs Harbour NSW 2450
T 02 6651 5484

ARMIDALE
92 Taylor Street
Armidale NSW 2350
T 02 8081 2685

MUDGEE
Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1234

PERTH
Level 1, Bishop's See
235 St Georges Terrace
Perth WA 6000
T 08 6218 2200

WOLLONGONG
Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200

MELBOURNE
Level 1, 436 Johnston St
Abbotsford, VIC 3076
T 1300 646 131

BRISBANE
Level 5, 12 Creek Street
Brisbane QLD 4000
T 07 3239 9600

ADELAIDE
2, 70 Pirie Street
Adelaide SA 5000
T 08 8470 6650

HARRINGTON
Dan Cleary Drive
Cnr The Northern Road
Harrington Park NSW 2567
T 02 8536 8600

1300 646 131
www.ecoaus.com.au