



Bushfire Protection Assessment for Masterplan and DCP

Dido Street, Spring Creek

25 May 2018



BPAD
Bushfire
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1 Property and proposal

Table 1: Subject site summary

Street address or property name:	Dido Street		
Suburb, town or locality:	Spring Creek	Postcode:	2533
Lot/DP no:	Lot 2 DP 805229, Lot 11 DP 810839 and Lot 45 DP 800176		
Local Government Area:	Kiama Municipal Council		
Zoning:	E2 Environment Conservation, R2 Low Density Residential, RU1 Primary Production.		
Type of development:	Residential subdivision		

1.1 Description of proposal

The proposal is for a masterplan subdivision of 3 lots into 90 lots and includes 3 stages within the Council land portion, and 2 stages in the Boral land portion (See **Figure 1**).

The application proposes an integrated housing development on a 3.7 ha site. The housing development would include 90 new residential homes, internal road system and pedestrian walkways.

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).

Assessment included a review of background documentation, design team consultation, GIS analysis and a site inspection on 10 January 2018.

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
Construction standard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.4
Water supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Gas and electrical supplies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5

1.3 Bush fire prone land status

The masterplan subdivision occurs on land classified as bush fire prone on the Kiama Municipal Council's bush fire prone land (BFPL) map¹.

¹ <https://www.planningportal.nsw.gov.au/find-a-property>

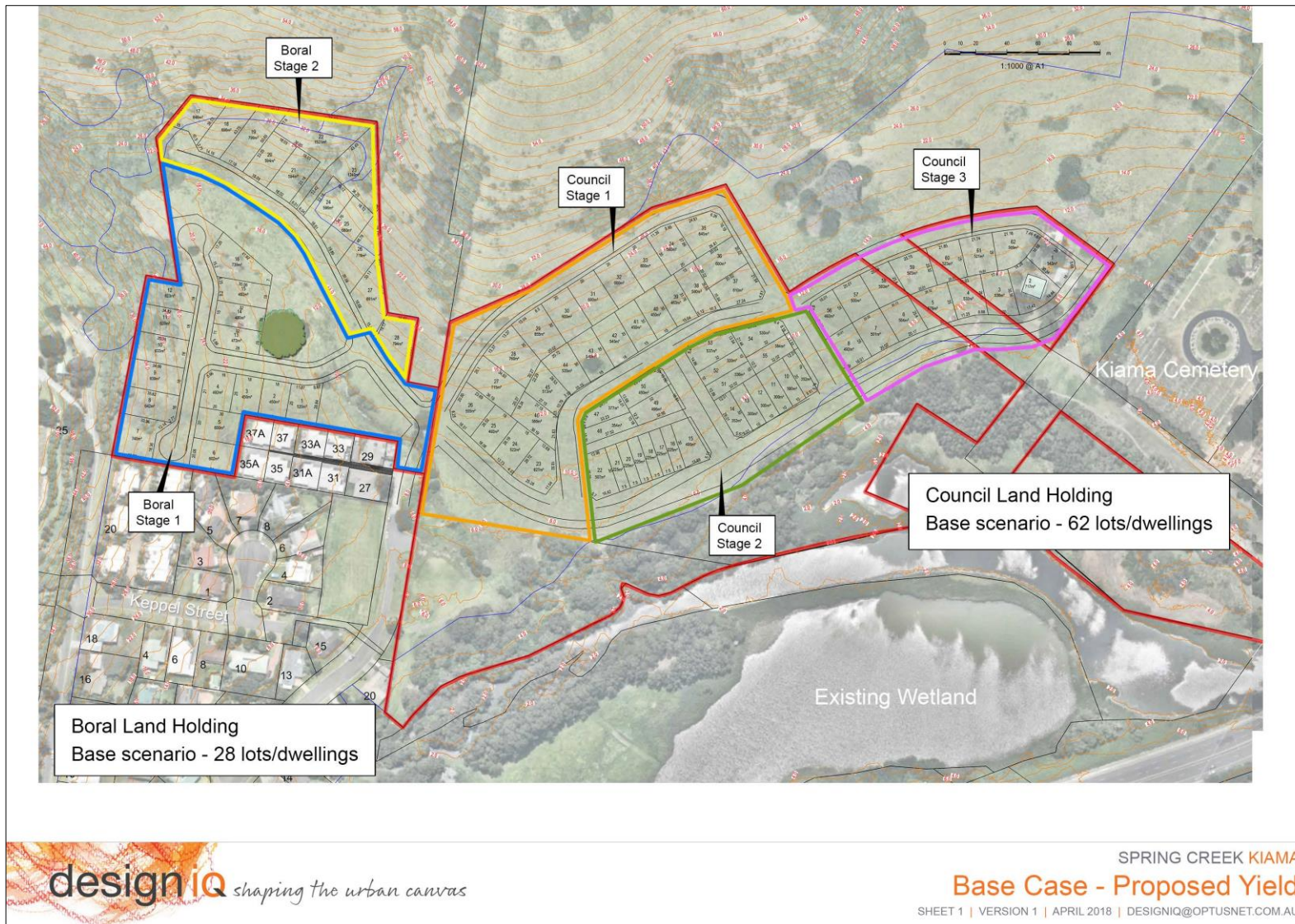


Figure 1: Subdivision layout and staging

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 and revised where required by site assessment.

The predominant vegetation has been determined from Keith (2004) vegetation maps and revised where required by site assessment.

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 Kiama Municipal Council and has a Fire Danger Index (FDI) of 100.

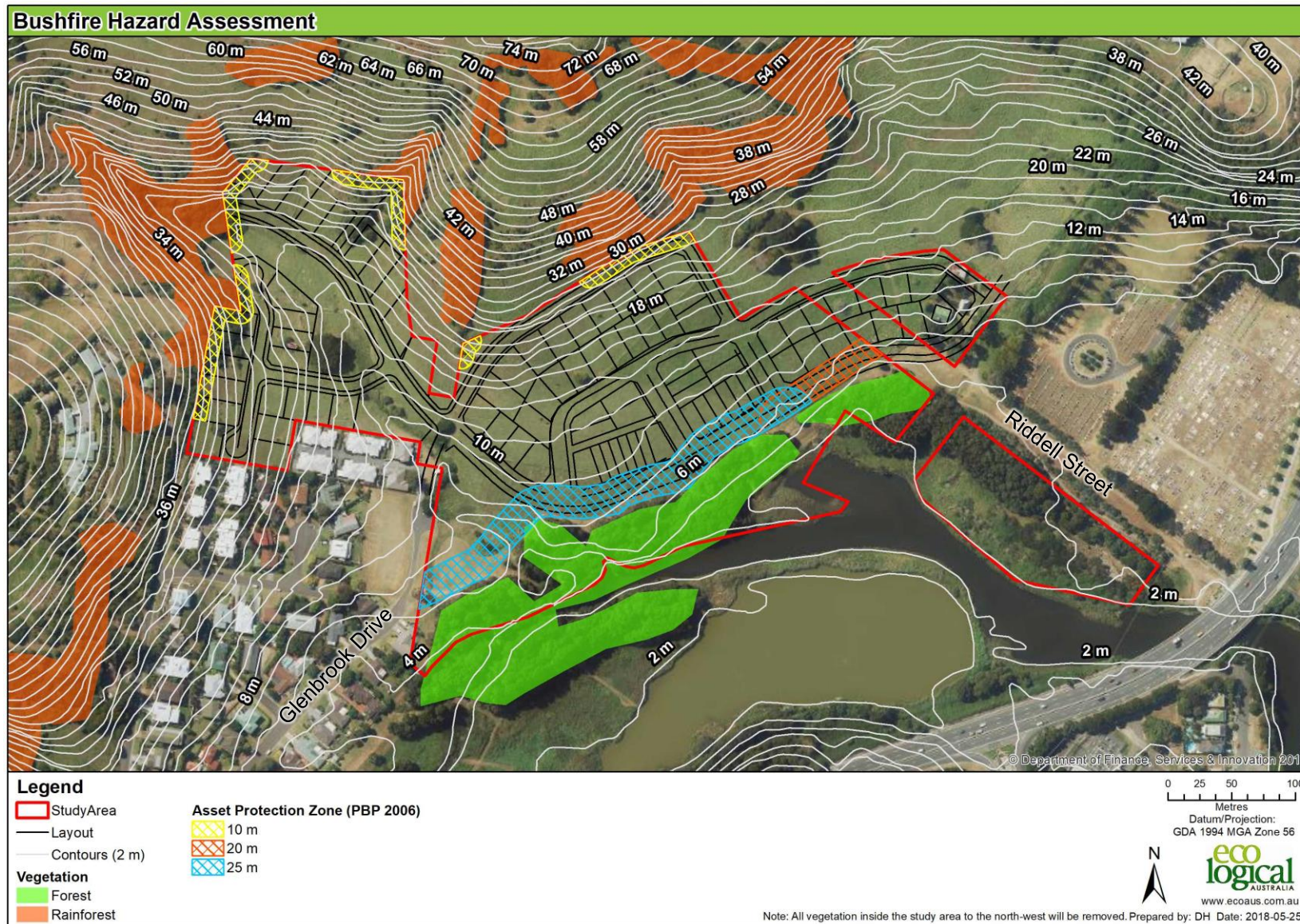


Figure 2: Bushfire hazard assessment and Asset Protection Zones (APZ)

3 Bushfire protection measures

3.1 Asset Protection Zones (APZ)

Table 3 shows the dimensions of the Asset Protection Zones (APZ) required in various 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**.

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	Slope	Vegetation	PBP required APZ (PBP 2006)	BAL-29 required APZ (AS 3959-2009)	Proposed APZ	Comments
North-west	All upslopes and flat land	Rainforest	10 m	11 m	10 m	APZ provided within boundary of subject land.
North-east	All upslopes and flat land	Rainforest	10 m	11 m	10 m	APZ provided within boundary of subject land.
North	All upslopes and flat land	Rainforest	10 m	11 m	10 m	APZ provided within boundary of subject land.
North	All upslopes and flat land	Rainforest	10 m	11 m	10 m	APZ provided within boundary of subject land.
South-east	All upslopes and flat land	Forest	20 m	25 m	20 m	APZ provided within boundary of subject land.
South	Downslope >0 to 5 degrees	Forest	25 m	32 m	25 m	APZ provided within boundary of subject land.
West	All upslopes and flat land	Rainforest	10 m	11 m	10 m	APZ provided within boundary of subject land.

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. Some buildings may be required to be constructed to BAL-40, however, this is not certain and typically can be reduced to BAL-29 with simple performance solution models.

3.4 Access

The primary access to the masterplan subdivision is via extension of the public road of Glenbrook Drive, with the alternate egress to be provided via a link road connecting to Riddell Street (see **Figure 2**). **Figure 1** and **Figure 2** show the internal and perimeter access within the masterplan subdivision. Perimeter roads are provided within the three stages of the Council portion of the development, however, a performance solution is proposed for part of the perimeter of the Boral land portion.

The performance criteria and acceptable solutions for the subdivision 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, except a small portion of perimeter road (see **Table 4**) where the access meets the relevant PBP performance criteria. Details of how these performance criteria are met are also described in **Table 4**.

Table 4: Components of proposed access compliant with performance criteria

Access Type	Description	Performance criteria	Comments
Perimeter Road	Portions of Boral land perimeter	Public road widths and design that allow safe access for firefighters while residents area evacuating area.	<ul style="list-style-type: none"> Evacuation of the masterplan subdivision will never be required due to bushfire. This is because all patches of vegetation are small and isolated and predominantly rainforest. In the unlikely event that these patches burn they will be fires that are quickly suppressed by nearby firefighting resources from Kiama and Jamberoo or they will burn out before evacuation could be completed. The portion of the Boral land without a perimeter road abuts long and well-established grazing land and rainforest on steep upslopes away from the lots. These slopes cannot be roaded without unnecessary environmental impacts e.g. erosion and visual, and are not necessary to provide effective firefighter operations which can safely and effectively be provided for the roads proposed in the masterplan subdivision.

3.5 Services – Water, electricity and gas

3.5.1 Water

The proposal will be serviced by a reticulated water supply. **Table 5** 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 5: Performance criteria for reticulated water supplies (PBP page 27)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
<ul style="list-style-type: none"> water supplies are easily accessible and located at regular intervals 	<ul style="list-style-type: none"> reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. 	Can comply
	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> hydrants are not located within any road carriageway 	Can comply
	<ul style="list-style-type: none"> all above ground water and gas service pipes external to the building are metal, including and up to any taps. 	Can comply
	<ul style="list-style-type: none"> 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 Staging

Staging within the Council and Boral portions of the subdivision will occur concurrently, i.e. Stage 1 in each will occur together, followed by Stage 2 together etc. There is no specific bushfire related staging measures required, with the exception of the alternate egress connection road to Riddell Street. Each stage is otherwise independently capable of meeting PBP and the long-term bushfire protection measures under the masterplan subdivision. The access road connection to Riddell Street is required for Stage 1 of both the Council and Boral lands.

5 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 and consultant reports. 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.

6 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 6**.

Table 6: Summary of bushfire protection measures assessed

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	APZ dimensions are detailed in Table 3 and Figure 2 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
APZ Maintenance plan	<input checked="" type="checkbox"/>	Identified APZ to be maintained in perpetuity to the detailed specifications in Section 3.2 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	<input checked="" type="checkbox"/>	BAL for dwellings to be determined at individual CDC/DA stage.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	Access to meet standards detailed in Table 7 . Performance solution addresses the requirement for perimeter road.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.4
Water supply	<input checked="" type="checkbox"/>	Reticulated water supply to meet PBP acceptable solution specifications for a subdivision.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.1
Electricity service	<input checked="" type="checkbox"/>	Electricity supply located underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.2
Gas service	<input checked="" type="checkbox"/>	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.3
Staging	<input checked="" type="checkbox"/>	No interim stage is to be constructed without compliance to PBP and compliant with the ultimate bushfire protection standards for the subdivision	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

7 Recommendations

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



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8 References

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). 2005. *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, Fourth edition 2005, SAI Global, Sydney.

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.

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 (FDI 100) 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 7: Performance criteria for proposed public roads (PBP page 21)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
<ul style="list-style-type: none"> • firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources) 	<ul style="list-style-type: none"> • public roads are two-wheel drive, all weather roads 	Complies
<ul style="list-style-type: none"> • public road widths and design that allows safe access for firefighters while residents are evacuating an area 	<ul style="list-style-type: none"> • 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) • the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas • traffic management devices are constructed to facilitate access by emergency services vehicles • public roads have a cross fall not exceeding 3 degrees • 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 • curves of roads (other than perimeter roads) are a minimum inner radius of six metres • 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 • there is a minimum vertical clearance to a height of four metres above the road at all times 	<p>Complies</p> <p>Complies except for that identified in Section 4</p> <p>Can comply</p> <p>Complies</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p>
<ul style="list-style-type: none"> • the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered 	<ul style="list-style-type: none"> public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression 	Complies
	<ul style="list-style-type: none"> 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 	Complies
<ul style="list-style-type: none"> there is clear access to reticulated water supply 	<ul style="list-style-type: none"> 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 	N/A
	<ul style="list-style-type: none"> 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 	N/A
<ul style="list-style-type: none"> parking does not obstruct the minimum paved width 	<ul style="list-style-type: none"> 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 	N/A
	<ul style="list-style-type: none"> 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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