eco logical AUSTRALIA

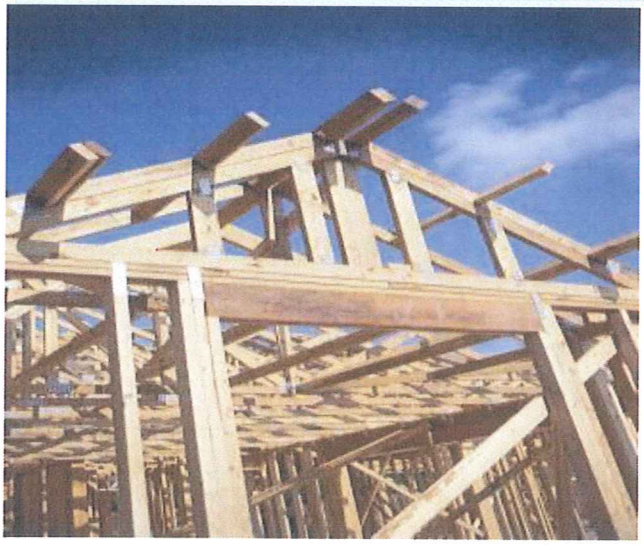


# Bushfire Protection Assessment

393 lot residential subdivision

133 Mary's Mount Road, Goulburn

November 2017



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Level 3

## DOCUMENT TRACKING

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# 1 Property and proposal

**Table 1: Subject site summary**

| | | | |
|---|---|---|---|
| **Street address or property name:** | 133 Mary's Mount Road | | |
| **Suburb, town or locality:** | Goulburn | **Postcode:** | 2650 |
| **Lot/DP no:** | Lot 28 DP 479 | | |
| **Local Government Area:** | Goulburn Mulwaree Council | | |
| **Zoning:** | E4 (Environmental Living), R2 (Low Density Residential). | | |
| **Type of development:** | Residential subdivision | | |

## 1.1 Description of proposal

The proposal is for subdivision of one lot into 393 residential lots, a residual lot and open space (See **Figure 1**).

The proposal is to create 393 new residential allotments within the Mary's Mount Development Area and the residual lot (north-west corner) to retain the existing dwelling and associated infrastructure under current ownership. Pastoral grazing has been the main agricultural use in the area.

## 1.2 Assessment process

The proposal was assessed in accord with 'Planning for Bush Fire Protection 2006' (RFS 2006), herein referred to as PBP (See **Appendix A** for a summary of the assessment process) due to the presence of remnant vegetation on site.

Assessment included a review of background documentation, design team consultation, GIS analysis and a site inspection on 19 October 2017.

**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 does not include land classified as bush fire prone on the Goulburn Mulwaree Council's bush fire prone land (BFPL) map and therefore is not considered to be an integrated development under requirement of Section 100B of the Rural Fires Act 1997.


**Figure 1: Subdivision layout**

# 2 Bushfire threat assessment

Prepared by: EB Date: 20/11/2017

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 10 m contour data and revised where required by site assessment.

The predominant vegetation has been determined from the site assessment.

Prepared by: EB Date: 20/11/2017

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 Goulburn Mulwaree Council and has a Fire Danger Index (FDI) of 100.

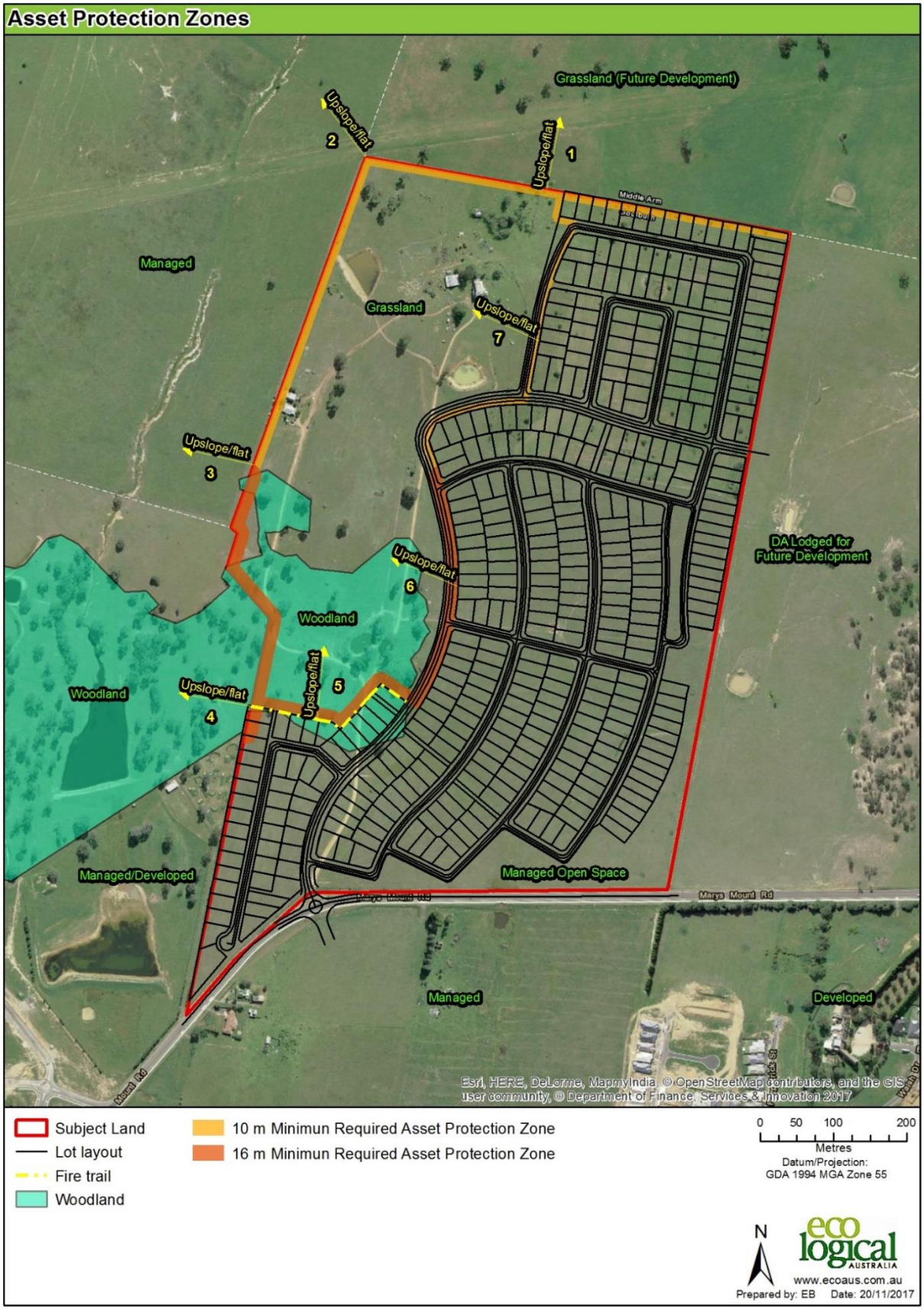


**Figure 2: Bushfire hazard assessment and Asset Protection Zones (APZ)**

# 3 Bushfire protection measures

## 3.1 Asset Protection Zones (APZ)


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The APZ located in the residual lot will be maintained via a Section 88b agreement.

## 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**

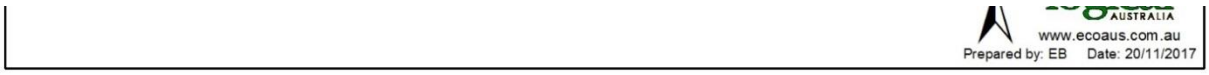
| Lot # OR direction from development boundary | Transect # | Slope | Vegetation | PBP required APZ (PBP 2006) | BAL-29 required APZ (AS 3959-2009) | Proposed APZ | Comments |
|---|---|---|---|---|---|---|---|
| North | 1 | All upslopes and flat land | Grassland | 10 m | 9 m | 10 m | To be located within subdivision lots and residual lot along northern boundary |
| North-west | 2 | All upslopes and flat land | Grassland | 10 m | 9 m | 10 m | To be located within residual lot |
| West | 3 | All upslopes and flat land | Grassland | 10 m | 9 m | 10 m | To be located within residual lot |
| South-west | 4 | All upslopes and flat land | Woodland | 10 m | 16 m | 16 m | To be located within subdivision lots and residual lot along western boundary |
| South | 5 | All upslopes and flat land | Woodland | 10 m | 16 m | 16 m | Includes fire trail along southern boundary of residual lot |
| East | 6 | All upslopes and flat land | Woodland | 10 m | 16 m | 16 m | To be located within proposed road on eastern edge of residual lot. |
| North-east | 7 | All upslopes and flat land | Grassland | 10 m | 9 m | 10 m | To be located within proposed road on eastern edge of residual lot. |

### 3.3 Construction standard

The Bushfire Attack Level (BAL) for future dwellings within the proposed subdivision will be determined at the individual dwelling Development Application (DA) stage, however, a maximum of BAL-29 is provided by the subdivision design using PBP fuel loads.

### 3.4 Access

Public road access to the subdivision is via Mary's Mount Road to the south (existing public road) and future development to the east.




show the access within the subdivision. It shows the following types of access:

- Perimeter public road;
- Internal public road; and
- A small section of perimeter fire trail on the adjoining residual lot.

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, except those identified in **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 |
|---|---|---|---|
| Access (1) - Public Roads | Dead end road in south-west corner | All roads are through roads. Dead ends are not recommended, but if avoidable are not more than 200 meters in length, incorporate a minimum 12 meter outer radius turning circle, are clearly signposted as a dead end and direct traffic away from the hazard. | The current subdivision layout contains one dead end access that is greater than 200 m in length. To address this issue, emergency access at the southern end of the proposed road onto Mary's Mount Road is provided via a 27 m opening. |
| Access (1) - Public Roads | | Public road widths and design that allows safe access for firefighters while residents are evacuating an area | A fire trail that meets the specifications detailed in **Table 7** formed as part of the APZ for the adjoining residual lot will provide additional rear access to 10 lots that do not have a perimeter road. These lots are located on a public through road that will allow egress in an emergency. |

## 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:** | | |
| • 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. | complies |
| | • 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. | complies |
| | • hydrants are not located within any road carriageway | complies |
| | • all above ground water and gas service pipes external to the building are metal, including and up to any taps. | complies |
| | • the provisions of parking on public roads are met. | complies |

### 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.

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

# 5 Conclusion

The proposed subdivision design 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 | ☑ | . | ☑ | ☐ | 3.1 |
| APZ Maintenance plan | ☑ | Identified APZ to be maintained in perpetuity 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-29 (using PBP fuel loads) is achievable. | ☑ | ☐ | 3.3 |
| Access | ☑ | Access to meet standards detailed in **Table 7** and **Table 8**<br>Performance solution addresses the requirement for a perimeter road for a small number of lots backing woodland area on the residual lot.<br>Emergency access arrangement at the southern end of the dead ends road provided. | ☑ | ☑ | 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 once the subdivision design meets the access requirements based on the identified issues in Section 3.4, that the subdivision be issued a Bush Fire Safety Authority.

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# 7 References

Goulburn Mulwaree Council. 2009. *Development Control Plan 2009.* Last amended 23rd June 2016. Goulburn Mulwaree Council, Goulburn.

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

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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) or Table A2.5 (FDI 80) 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 fire trail (PBP page 25)**

| Performance Criteria | Acceptable Solutions | Complies |
|---|---|---|
| **The intent may be achieved where:** | | |
| • the width and design of the fire trails enables safe and ready access for firefighting vehicles | • a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass is provided.<br>• the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed.<br>• a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided.<br>• the crossfall of the trail is not more than 10 degrees.<br>• the trail has the capacity for passing by:<br>  • reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and/or<br>  • a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay.<br>• *Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed.* | Can comply<br>Can comply<br>Can comply<br>Can comply<br>Can comply |
| • Fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non-authorised persons | • the fire trail is accessible to firefighters and maintained in a serviceable condition by the owner of the land.<br>• appropriate drainage and erosion controls are provided.<br>• the fire trail system is connected to the property access road and/or to the through road system at frequent intervals of 200 metres or less.<br>• fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge).<br>• gates for fire trails are provided and locked | Can comply<br>Can comply<br>Can comply<br>Can comply<br>Can comply |
| • Fire trails designed to prevent weed infestation, soil erosion and other land degradation | • fire trail design does not adversely impact on natural hydrological flows.<br>• fire trail design acts as an effective barrier to the spread of weeds and nutrients.<br>• fire trail construction does not expose acid-sulphate soils. | Can comply<br>Can comply<br>Can comply |

**Table 8: 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) | Partial performance solution in Table 4 |
| | • 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 | Partial performance solution in Table 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 |
| • roads that are clearly sign posted (with easy distinguishable names) | • 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 |

| Performance Criteria | Acceptable Solutions | Complies |
|---|---|---|
| and buildings / properties that are clearly numbered | • 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 | |
| • 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<br>• 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<br>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<br>• public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road | Can comply<br>Can comply |

# Appendix C- Photographs

**Photo 1: Mary's Mount Road**

**Photo 2: Grassland and woodland**

**Photo 3: Existing dwelling**

**Photo 4: Grassland**

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ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management


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