



## Bushfire Protection Assessment

Proposed subdivision – O’Connell Street, Caddens

Prepared for  
**Legacy Property ATF LegPro 54 Unit Trust**

27 October 2016



## DOCUMENT TRACKING

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Bushfire template 12/8/13

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# 1 Property and proposal

<b>Street or property name:</b>	O’Connell Street		
<b>Suburb, town or locality:</b>	Caddens	<b>Postcode:</b>	2747
<b>Lot and DP:</b>	Lot 101 DP 564332, Lot 2 & Lot 6 DP 502333, Lot 1 DP 515678, Lot 755 DP 1180111, Lot 51 DP 1189505, Lot 11-12 DP 522660.		
<b>Local Government Area:</b>	Penrith City Council		
<b>Type of area:</b>	Urban		
<b>Type of development:</b>	Residential subdivision		

## 1.1 Description of proposal

Legacy Property ATF LegPro 54 Unit Trust commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for a proposed subdivision at O’Connell Street, Caddens.

The proposed subdivision development is within the Caddens Hill Estate and will occur over 6 stages with Stage 1 the subject of an approved development application. This report relates to Stages 2-6 and the future sporting fields which will result in the creation of 451 residential lots and associated roads and infrastructure and is located to the east of Stage 1

## 1.2 Location and description of subject land

The subject land is located in the new south western Sydney suburb of Caddens approximately 55 km west of the Sydney Central Business District, Penrith City Council Local Government Area as shown in **Figure 1**.

**Figure 2** shows the proposed lot layout for Stages 2-6.

**Figure 3** shows the subject land and the location of the proposed subdivision in relation to the nearest bush fire prone vegetation. This consists of grassland to the north and south of the development.

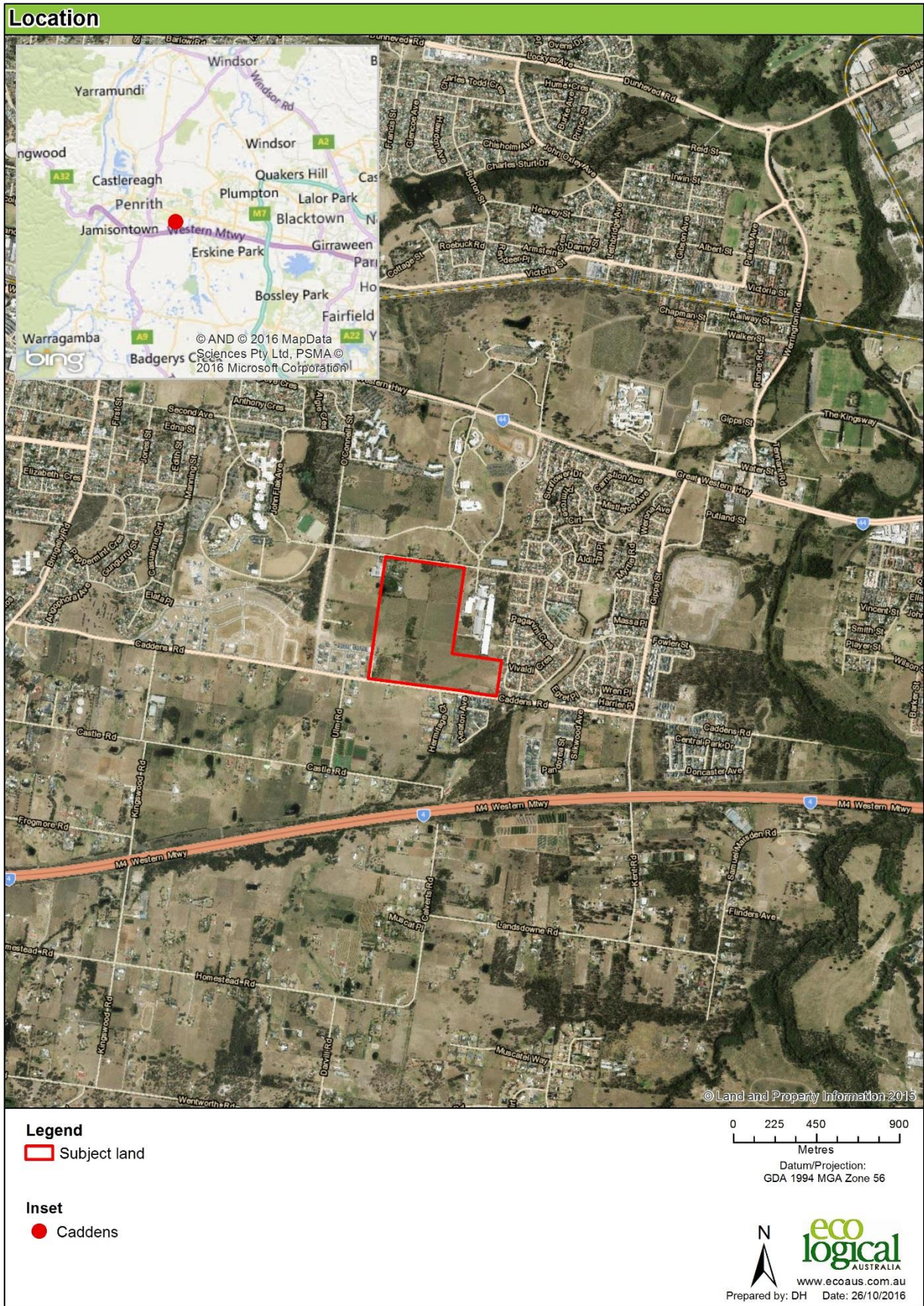


Figure 1: Location

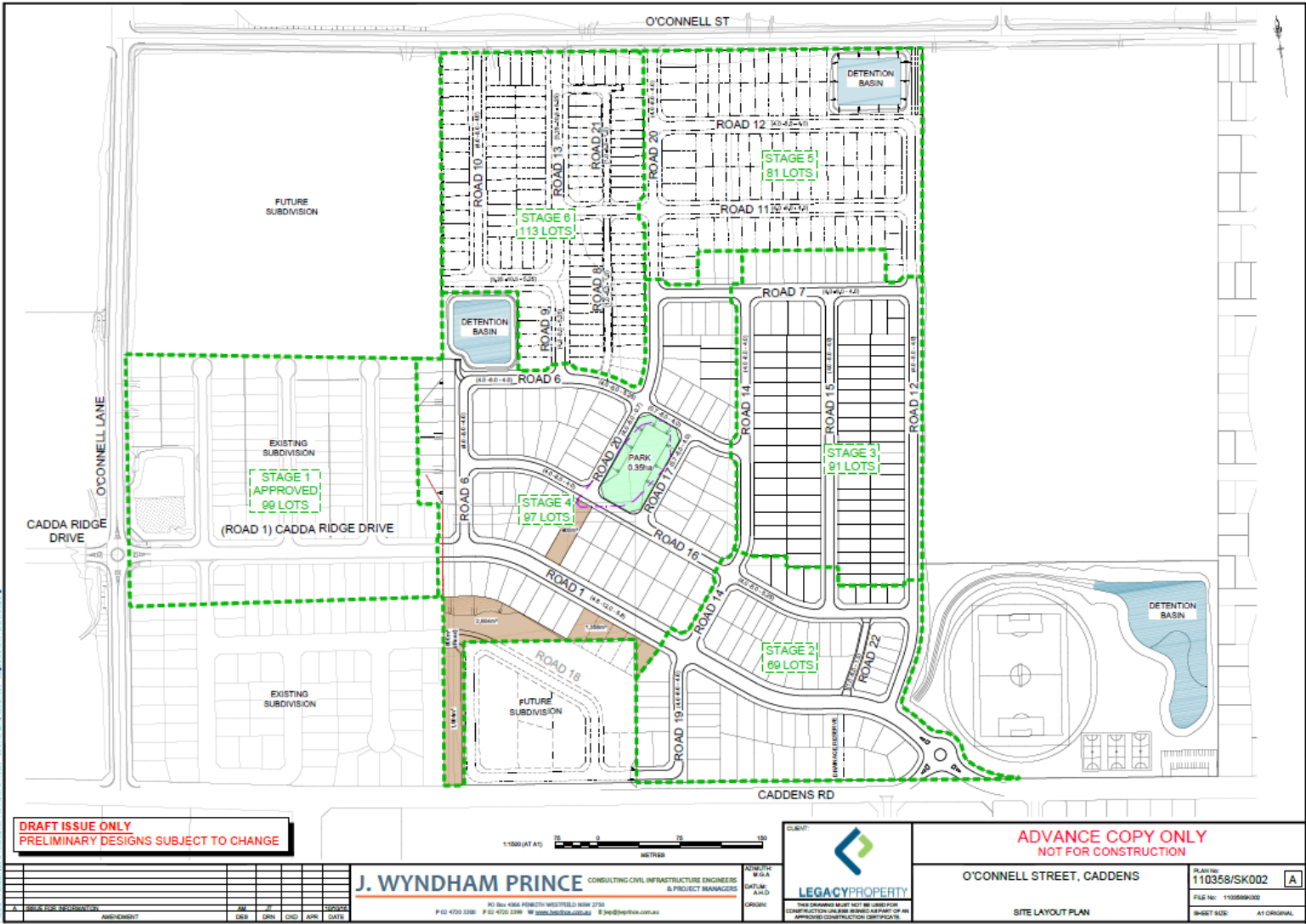


Figure 2: Development Plan

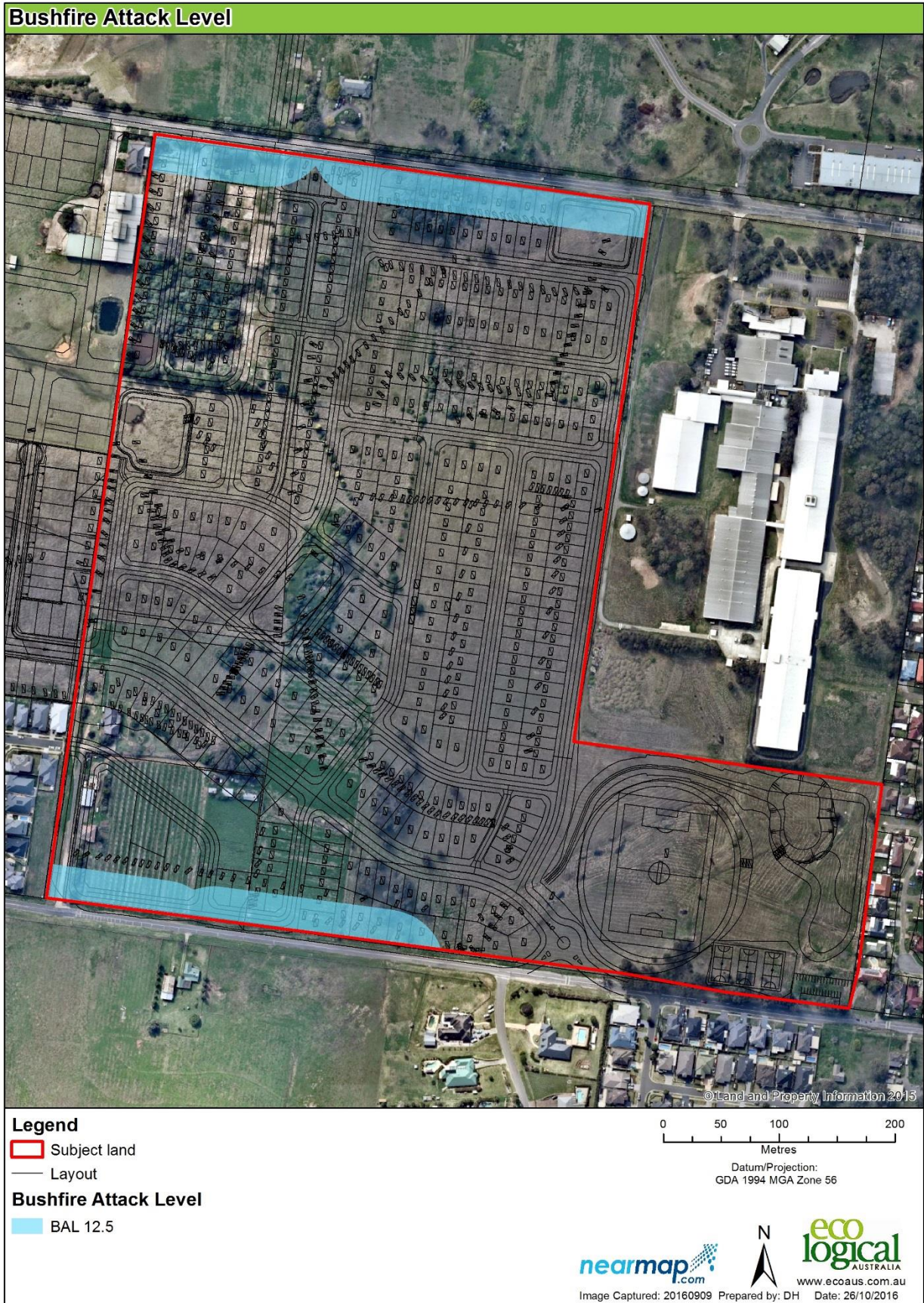


Figure 3: Bushfire Hazard Assessment



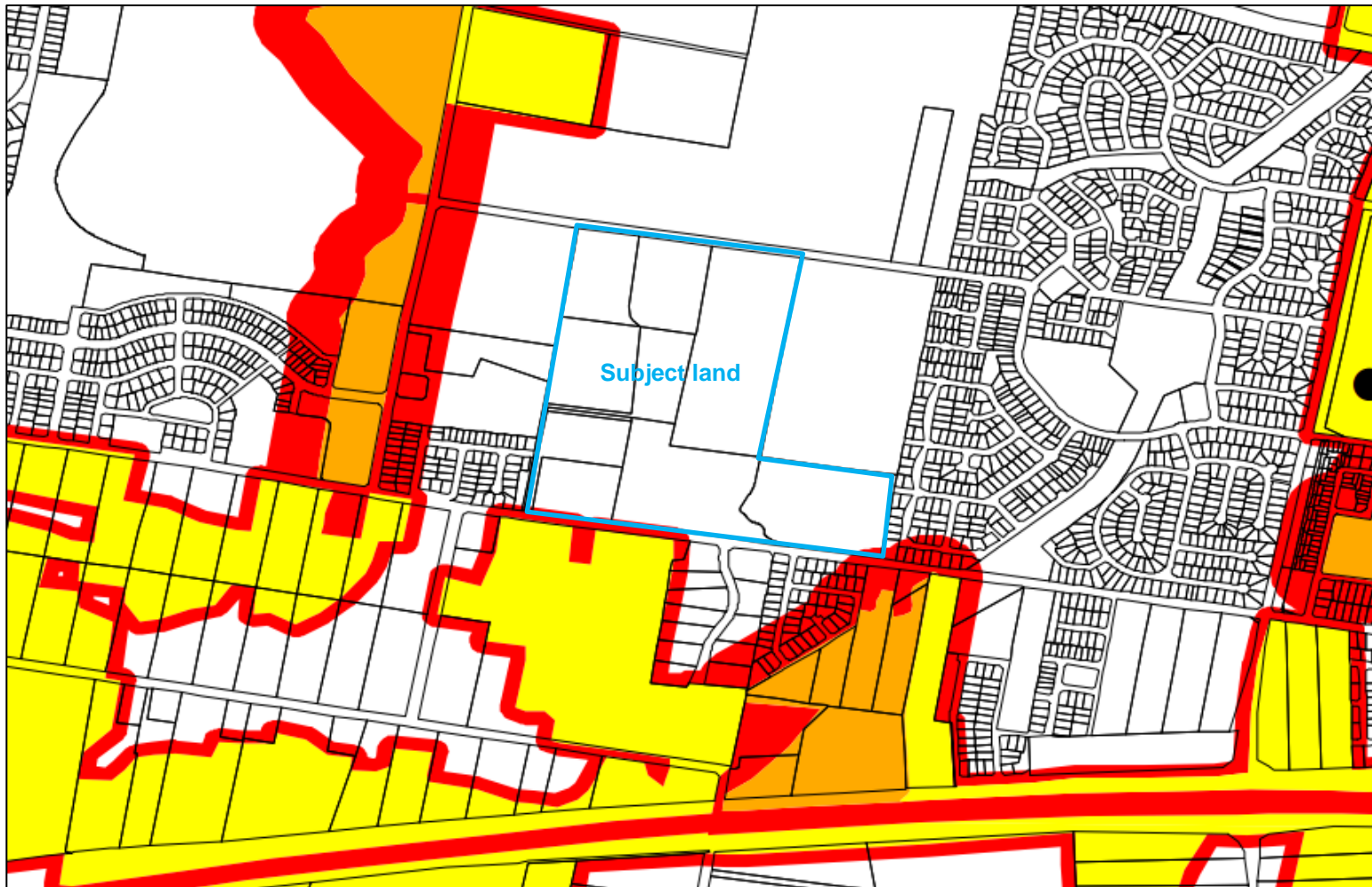


Figure 4: Bushfire Hazard Assessment

## 2 Bushfire threat assessment

The subject land is identified as bush fire prone land by Penrith City Council as shown in **Figure 4**. It is partially impacted by the Vegetation Category 1 buffer due to the grassland vegetation south of Caddens Road. This report has been prepared in accordance with Section 100B of the *Rural Fires Act 1997* and *Planning for Bush Fire Protection 2006* (RFS 2006), herein referred to as PBP.

### 2.1 Vegetation types

In accord with PBP the predominant vegetation class has been determined for a distance of at least 140 m from boundary of the proposed development. The predominant vegetation and effective slope assessments are shown in **Table 1**.

Much of the surrounding land is subject to existing or future residential subdivision as shown in **Figure 2**. To the east is managed land and the land to the west been cleared to facilitate Stage 1 and is managed land.

To land to the north and south is pastureland in varying degrees of management. A conservative approach has been taken and this vegetation is categorised as ‘Grassland’ in accordance with PBP.

### 2.2 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. This assessment was made with from a desktop analysis of 2 m contours. The subject land is gently sloping downwards from west to east, and both the land under the grassland vegetation to both the north and south lies on a slight cross-slope gradient, falling within the PBP category ‘>0-5 degrees downslope’.

### 3 Asset protection zones and construction

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**. The APZ calculation is tabulated below.

**Table 1: Threat assessment, APZ and category of bushfire attack**

Direction from envelope	Slope <sup>1</sup>	Vegetation <sup>2</sup>	PBP required APZ <sup>3</sup>	Available APZ	Comments
North	>0-5° downslope	Grassland	10 m	20 m	Provided by O’Connell Street to the north and Caddens Road to the south.
South	Upslope	Grassland	10 m	20 m	
West and South	Managed land				

<sup>1</sup> Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

<sup>2</sup> Predominant vegetation is identified, according to PBP and “Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate”.

<sup>3</sup> Assessment according to Table A2.4 of PBP

#### 3.1 APZ maintenance plan

O’Connell Street and Caddens Road currently provide the required APZ. The following fuel management specifications are required for any landscaping undertaken within the subject land:

- The presence of a few shrubs or trees is acceptable provided that 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
  - are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species.

#### 3.2 Construction standard

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of *Australian Standard AS 3959-2009 ‘Construction of buildings in bushfire-prone areas’* (Standards Australia 2009). The BAL is based on known vegetation type, effective slope, and managed separation distance between the development and the bushfire hazard.

In accordance with AS 3959, BALs are required for dwellings within 50 m of a grassland hazard. Future dwellings within Stage 2-6 that are within 50 m of a grassland hazard will require a BAL to be applied at development application stage. As a result of the separation provided by adjoining roads the maximum BAL applicable is BAL-12.5 as shown in **Figure 3**.

## 4 Utilities and access

### 4.1 Water supply

The furthest point from any dwelling to a hydrant will be less than 90 m in accordance with *Australian Standard AS 2419.1 ‘Fire hydrant installations – System design installation and commissioning’* (Standards Australia 2005).

The reticulated water supply is to also comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply uses a ring main system for areas with perimeter roads.
- Hydrants are not located within any road carriageway.
- All above ground water and gas service pipes external to the building are metal, including and up to any taps.
- The PBP provisions of parking on public roads are met.

### 4.2 Gas and electrical supplies

The electricity supply to the proposed development is to be located underground. This complies with PBP.

Any gas services are to be installed and maintained in accordance with *Australian Standard AS/NZS 1596 ‘The storage and handling of LP Gas’* (Standards Australia 2014).

### 4.3 Access

#### 4.3.1 Public roads

The proposed public road layout within the subdivision and its linkages to existing surrounding roads complies with PBP (refer to **Figure 2**). The proposed roads are generally, two way with a minimum 8 m wide carriageway, the narrowest having a 6 m wide carriageway. There are a number of traffic calming devices (blisters) located within the road network which restrict the total width of the roadway. The width of any road at its narrowest point must allow for suitable turning and trafficable areas for fire vehicles. Given the low bushfire risk posed, existing perimeter roads (O’Connell Street and Caddens Road) and numerous access/egress roads away from the hazard, the proposed roads widths achieve the PBP performance criteria *‘public road widths and design that allow safe access for firefighters while residents are evacuating an area’*.

#### 4.3.2 Access and egress

Future dwellings within the proposed subdivision will be accessed via standard residential driveways. These residential driveways do not need to comply with any specific bushfire access design requirements because the following applies to the proposed subdivision:

- (i) The proposed subdivision will be serviced by reticulated water
- (ii) The furthest point of any future dwellings within the proposed subdivision from the nearest hydrant will be no greater than 70 m; and
- (iii) The speed limit within the proposed subdivision will be less than 70 kph

**Table 2: Performance criteria for proposed public roads (PBP p. 23)**

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

## 5 Assessment of environmental issues

At the time of assessment, there were no known significant environmental features, threatened species or Aboriginal relics identified under the *Threatened Species Conservation Act 1995* or the *National Parks Act 1974* that will affect or be affected by the bushfire protection proposals in this report.

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

## 6 Recommendations and conclusion

The proposal consists of staged residential subdivision within a grassland area that will be subject to future development. The development satisfies the aim and objectives of PBP and the standards for subdivision as specified in Section 4.1.3 of PBP as outlined below:

- Landscaping is to have regard to the vegetation management requirements outlined in **Section 3**.
- Water supply is to be installed in accordance with the requirements outlined in **Section 4**
- Electrical services are to be underground (**Section 4**).
- Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2014 (**Section 4**).
- Public roads are to comply with the requirements outlined in **Section 4** of this report.

In the author’s professional opinion, the bushfire protection measures demonstrated in this report comply with *Planning for Bush Fire Protection 2006* and allow for the issue of a Bush Fire Safety Authority.

If you have any questions or concerns in respect to this report, please contact Steven Houghton on (02) 8536 8634.



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## References

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

Standards Australia. 2009. *Construction of buildings in bushfire-prone areas*, AS 3959-2009. SAI Global, Sydney.

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





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