



**AE Design Partnership Pty Ltd**  
**Elizabeth Drive Biodiversity Assessment**  
**Bushfire Assessment**

March 2018

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# 1. Introduction

This report is prepared for AE Design Partnership (acting on behalf of the client) to demonstrate that a proposed 14 lot industrial subdivision meets the specific *Aims and Objectives* of Planning for Bushfire Protection 2006 (NSWRFS 2006) (PBP).

The subject land is designated as:

**Junction Cecil Road and Elizabeth Drive, Cecil Park (Lot 2, Plan No. DP2954)**

The following subdivision is proposed:

**Fourteen lot industrial subdivision with vegetation reserve**

This development is being assessed as 'Infill (and other developments)' as identified in PBP and in accordance with Section 79BA of the Environmental Planning and Assessment Act (EP&A Act). It is neither residential or a special fire protection purposes development.

This report is prepared to provide sufficient information to demonstrate the development complies with aims and objectives of PBP, including:

- i. Protection of occupants from exposure
- ii. Provision of a defendable space
- iii. Provision of separation between buildings and hazards
- iv. Operational access and egress
- v. Ongoing management and maintenance of bushfire protection measures
- vi. Adequacy of proposed services

## **Summary**

The bushfire protection measures incorporated into the subdivision demonstrate its compliance with the aims and objectives of PBP.

# 2. Description of the property

## **2.1 Site location details**

This report is prepared for 1111-1141 Elizabeth Drive, Cecil Park, 2178 (Lot 2, Plan No. DP2954) (the subject land), for a proposed fourteen lot industrial subdivision and vegetation reserve (Figure 1). These lots may be suitable for further development as Class 5-9 buildings under the National Construction Code.

The subject land currently includes a residence in the south east near Elizabeth Drive and vegetation, dam and creek line running along the north western boundary. The subject land is surrounded by partly cleared, private rural residential blocks, with Cecil Road and Elizabeth Drive bounding the western and southern boundaries and the M7 Motorway and Wallgrove Road within 300m of the eastern border.

Part of the site (and adjoining areas) is identified as Future Residential Growth Area (pub. 2014-01-28). The site also adjoins lots to the north zoned as RU4 Primary Production Small Lots.

The subject land is located within Fairfield City Council that is within the 'Greater Sydney Region' and has a corresponding Fire Danger Index (FDI) rating of 100 (NSWRFS 2006).



Paper Size A3

0 5 10 20 30 40 50

Metres

Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 55



## Legend

- Base Cadastre
- Subdivision
- Watercourse
- Vegetation Reserve
- Road
- Contour



ae design partnership  
Elizabeth Drive

Job Number 21-27092  
Revision A  
Date 20 Feb 2018

## Site Overview

Hazelwood Drive (cnr Lignite Court) Morwell VIC 3840 Australia T 61 3 5136 5800 F 61 3 5136 5888 E mwlmmail@ghd.com W www.ghd.com

N:\AU\PortMacquarie\Projects\21\27092\GIS\Maps\Working\Elizabeth Drive.mxd  
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## 2.2 Vegetation Classification

The identification of bush fire prone areas is required under Section 146 of the Environmental Planning and Assessment Act (1979). The subject land is designated as bushfire prone (as per Fairfield City Council mapping -see Figure 2) due to the presence of bushfire prone land within and adjoining the site. A site-based hazard assessment was used to confirm bushfire prone vegetation adjoining the subject land.

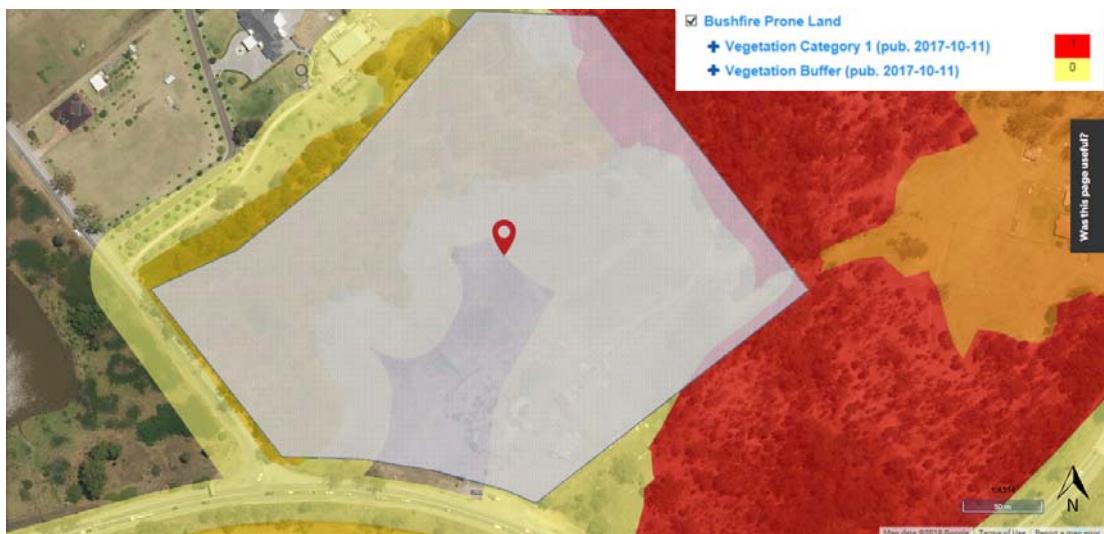


Figure 2 Bushfire Prone Lands Mapping

Site assessment on the 18 January 2018 confirmed the presence of bushfire prone vegetation within and adjoining the subject land (to the east). The predominant vegetation class formation from PBP (NSWRFS 2006) are given in Table 1 below with photos presented in Figure 3.

Table 1 Vegetation type, Formation and Classification

Vegetation Type	Vegetation Formation (Keith 2004 <sup>1</sup> )	AS3959:2009 Classification <sup>2</sup>
Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin (HN528)	Grassy Woodlands	Woodland
Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin (HN529)	Grassy Woodlands	Woodland

The vegetation identified as *Grey Box- Forest Red Gum* *grassy woodlands* matches the description of *Grassy Woodlands* vegetation formation (NSWRFS 2006) for the following reasons:

- Dominated by sparse layer of eucalypts, typically boxes and red gums, 15-35 m
- Diverse ground cover with long lived perennial tussock grasses
- Shrubs sparsely distributed

<sup>1</sup> Keith, D.A. (2004) Ocean Shores to Desert Dunes, the native vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation, Sydney.

<sup>2</sup> Standards Australia 1999. AS3959 – 2009 Construction of Buildings in Bushfire-prone areas. Standards Australia, Sydney



Figure 3 Vegetation photographs

These grassy woodland vegetation formations are located on the eastern boundary of the site, with a narrow strip on the northern boundary of the site. While these vegetation communities can support high intensity bushfires, most likely burning as a faster moving surface fire in open woodland communities without a shrubby understorey, potential bushfire impacts to the site are constrained by:

- Managed vegetation to the north (mown rural residential properties and horticultural enterprises) reducing the potential for a fire to develop and spread from the north;
- A large quarry, grazed land and water retention dam located to the west reducing potential fire runs;
- Elizabeth Drive to the south, providing separation from a currently grazed and planted area, which is identified for future subdivision; and
- The small patch of woodland vegetation to the east adjoins the M7 motorway.

### 2.3 Slope Description

Site assessment confirmed slope class within the vegetation hazard is:

- *Upslope* on the **northern part of the subdivision including Lot 8** to the creek; and
- Predominately *>0-5 degrees downslope* on the eastern parts of the subdivision (with the exception of some areas to the north east which were *upslope*. As a conservative approach, the **slope along the eastern boundary (with the exception of Lot 8)** is classed as *>0-5 degrees downslope* (see Table 2).

### 2.4 Significant environment values

There are no significant environment values. The vegetation reserve containing a creek line will be retained.

### 2.5 Threatened fauna and threatened flora

The vegetation community within and adjoining the subject land consists of

- Grey Box – Forest Red Gum (HN528, HN529)

There are no threatened species currently recorded on the subject land.

### 2.6 Aboriginal Cultural Heritage sites present

There is no Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant situated on the property.

### 3. Assessment of the proposed development

As the proposed industrial subdivision is an ‘infill (and other developments)’ under PBP (and is neither a residential infill development, residential subdivision nor special fire protection purposes development) it must demonstrate it can satisfy the aims and objectives of PBP (as identified in Chapter 1 of PBP) as per the Sections referenced below.

Objective	Objective Description from PBP	Report section
[i]	Afford occupants of any building adequate protection from exposure to a bush fire	Section 3.1
[ii]	Provide for a defendable space to be located around buildings	Section 3.1
[iii]	Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition	Section 3.1
[iv]	Ensure that safe operational access and egress for emergency service personnel and residents is available	Section 3.2
[v]	Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)	Section 3.3
[vi]	Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting).	Section 3.4

#### 3.1 The extent to which the development is to provide for protection from exposure, defendable space and separation (Objective (i), (ii) and (iii))

Asset Protection Zones (APZ) provide protection from exposure, defendable space and hazard separation. APZs are not specifically required for ‘other development’ as is proposed in this industrial subdivision, but they have been applied to meet the objectives of PBP (NSWRFS 2006). APZ are established between a building and vegetation hazard, and their calculation is based on vegetation and slope in accordance with Appendix 2 of the PBP (NSWRFS 2006). Proposed APZs are shown in Table 2 and on Figure 4.

Table 2 APZ defendable space dimensions

Vegetation	Slope Class	APZ	Lots
Woodland	Upslope/Flat	10 m	1, 9 and 14 (northern boundary) 8 (northern and eastern boundary) 7 (eastern boundary)
Woodland	>0-5 degrees	15 m	4-6 (southern boundary)

Occupants and site managers should complete a Bush Fire Survival Plan as formulated by the NSW Rural Fire Service and the NSW Fire and Rescue. An emergency evacuation plan is not recommended as a condition of consent.

### Summary

- ✓ The PBP objectives for building exposure protection, defendable space and hazard separation are met through the provision of an APZ's applied in accordance with the dimensions identified in Table 2 for the subject land, extending from the building wall outwards and accommodated entirely within each lot (or adjoining roadways, pathways and managed vegetation areas).

## 3.2 Operational access and egress for emergency services personnel and residents is available

In line with PBP (NSWRFS 2006), any new subdivision should design public roads and property access roads to ensure safe access, egress and defendable space for emergency services.

The subject land is accessed from Elizabeth Drive and Cecil Road. These existing public roads are two way, two wheel drive, all weather roads and are of sufficient width to allow fire fighting vehicles to work. The entrance to the M7 motorway is within 500m of the development.

There will be public roads within the development (see Figure 1). This road is to be constructed to meet the minimum widths set out in Table 4.1 in PBP (NSWRFS 2006) (see below), and be a two-wheel drive, all weather road. Additionally, the following requirements are to be meet:

- Cross fall shall not exceed 3 degrees, maximum grades for sealed roads do not exceed 15 degrees
- Curves are a minimum inner radius of 6 metres and minimum distance between inner and outer curves is 6 metres
- Minimum vertical clearance of 4 metres above the road
- The capacity of road surfaces is sufficient to carry fully loaded firefighting vehicles
- Hydrants are located outside of parking reserves/bays to ensure accessibility to reticulated water for fire suppression

Curve radius (inside edge) (metres)	Swept Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5

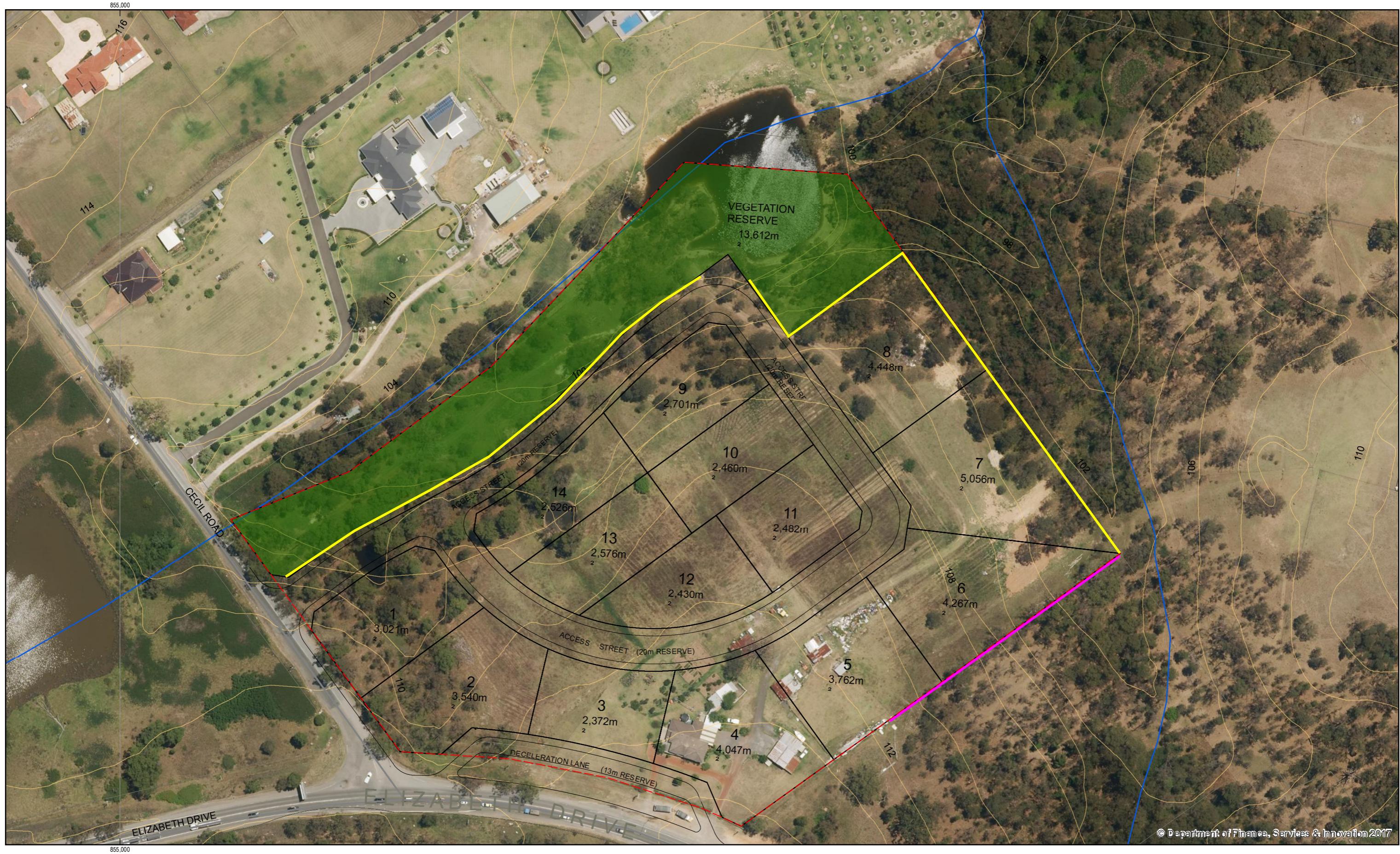
Source: AS 2890.2 – 2002.

Table 4.1 – Road widths for Category 1 Tanker  
(Medium Rigid Vehicle)

The public road network provides suitable access for, and egress for, fire management and emergency response purposes.

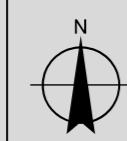
### Summary

- ✓ Fire fighters are provided with two-way all weather access to each lot
- ✓ Public road width allows safe access for fire fighters and evacuating site occupants
- ✓ Road capacity is sufficient to carry a fully loaded fire vehicle
- ✓ Existing roads and roads within the new development will be clearly signposted
- ✓ Parking does not obstruct the paved width



Paper Size A3  
0 5 10 20 30 40 50  
Metres

Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 55



## Legend

- Base Cadastre
- Subdivision
- Watercourse
- Road
- Contour
- Vegetation Reserve
- 10 m APZ
- 15 m APZ



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Elizabeth Drive

Asset Protection Zones

### 3.3 Provide for ongoing management and maintenance of bush fire protection measures

APZs within the proposed development will largely comprise of new roadway and footpath (to the north) and hardstand areas surrounding industrial buildings. As such there is little opportunity for fuel hazards to accumulate. Therefore management of APZ's will meet and largely exceed the requirements of Standards for Asset Protection Zones (NSWRFS 2005).

### 3.4 Utility services are adequate to meet the needs of fire fighting

#### 3.4.1 Water Supply

The subject land has reticulated water supply, currently located on Elizabeth Drive, which can be extended throughout the subdivision, with a ring main system for all internal roads.

Fire hydrant spacing sizing and pressures must comply with AS2419.1 – 2005.

Hydrants must be accessible (ie outside parking bays or within the access road) and suitably spaced.

#### 3.4.2 Electricity

Electricity lines are, where practicable, underground. Where overhead electrical transmission lines are proposed:

- lines are installed with short pole spacing (30 metres) unless crossing gullies, gorges or riparian areas
- no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002)

#### 3.4.3 Gas

In order to comply with the Rural Fires Regulation, all gas supplies are to be installed and maintained in accordance with AS/NZS 1596–2014. All fixed gas cylinders are kept clear of flammable materials, close to the building with release valves pointing away from the building.

#### **Performance Criteria Summary**

<ul style="list-style-type: none"><li>✓ For each lot, a dedicated accessible water supply is to be located onsite in compliance with the conditions set out in Section 3.4.1</li><li>✓ Gas and electricity can be installed to limit the potential for ignition to bushland</li></ul>
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## 4. Assessment of the extent to which the proposed development conforms

The bushfire protection measures that apply to the subject land comply with the Aims and Objectives of PBP (NSWRFS 2006). As a result, compliance with the objectives of PBP has been achieved, as summarised in the table below. The development including the bushfire protection measures outlined in Section 2 of this report is therefore appropriate for the issuance of bush fire safety certificate.

**Table 3** *Compliance with Planning for Bushfire Protection 2006*

Objective	Assessment of compliance with acceptable solutions	Meets Objective?
(i) Afford occupants of any building adequate protection from exposure to a bush fire	The proposed development has achieved the objectives by providing an APZ in accordance with Section 4.1.3 of PBP, i.e. <ul style="list-style-type: none"> <li>• A defendable space in the form of an APZ can be provided in accordance with Appendix 2 of Planning for Bushfire Protection 2006</li> <li>• The APZ for each lot can be wholly within the boundaries of the development site</li> <li>• The APZ can be managed in accordance with the requirements of Standards for Asset Protection Zones (RFS 2005)</li> <li>• The APZ is located on lands with slopes less than 18 degrees</li> </ul>	Yes
(ii) Provide for a defendable space to be located around buildings		
(iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition		
(iv) Ensure that safe operational access and egress for emergency service personnel and residents is available	The proposed development has achieved the objective by providing appropriate access solutions, i.e.: <ul style="list-style-type: none"> <li>• Existing and proposed public roads are two-wheel drive</li> <li>• Traffic calming devices are not proposed</li> <li>• Public roads will have a crossfall not exceeding 3 degrees and grades not exceeding 10 degrees.</li> <li>• A minimum vertical distance of &gt;4 m will be maintained.</li> <li>• Curves will be minimal and have the required dimensions.</li> </ul>	Yes

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	<ul style="list-style-type: none"> <li>• Existing public roads have a capacity of greater than 15 tonnes and there are no bridges with load restrictions.</li> <li>• Parking will be within driveways and will not obstruct minimum paved width</li> </ul>	
(v) Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)	The proposed development has achieved the objective through the location of APZs within existing roadways and pathways, as well as hardstand areas of the industrial development	Yes
(vi) Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting).	<p>The proposed development has achieved the objective by complying with the acceptable solutions, i.e.;</p> <ul style="list-style-type: none"> <li>• Reticulated supplies will be provided within the required specifications and capacity (refer to section 3.2)</li> <li>• Hydrants will not be located within parking areas and will comply with AS 2419.1 (2005).</li> <li>• Electricity will be supplied via overhead powerlines with 30 m pole spacing and in accordance with Energy Australia specifications (NS179, 2002) and maintained according to National distribution network standards.</li> <li>• Gas supplies, where installed, will be in accordance with AS/NZS 1596 (2014).</li> </ul>	Yes

## 5. Recommendations

The following bushfire protection measures are made for the proposed 14 lot industrial subdivision of the subject land at 1111-1141 Elizabeth Drive, Cecil Park, 2178 (Lot 2, Plan No. DP2954). Application of these recommendations allows the development to conform with the aims and objectives of Planning for Bush Fire Protection (NSWRFS 2006) (PBP), as detailed in Section 3 of this report.

(i) Protection from exposure	From the commencement of construction and in perpetuity, APZs can be accommodated within lots adjoining bushfire hazard in accordance with the dimensions identified in Table A2.4 in Appendix 2 of PBP, and the NSW RFS document 'Standards for asset protection zones'.  Note: AS3959:2009 'Construction of Buildings in Bushfire Prone Areas' does not apply to industrial developments.
(ii) Defendable space	
(iii) Appropriate hazard separation	
(iv) Operational access and egress	<p>The proposed road network within the subdivision is:</p> <ul style="list-style-type: none"><li>• Is two-wheel drive.</li><li>• Do not include traffic calming devices.</li><li>• Public roads with a crossfall not exceeding 3 degrees and grades not exceeding 10 degrees.</li><li>• Have a minimum vertical distance of &gt;4 m maintained from vegetation.</li><li>• Public roads have a capacity of greater than 15 tonnes and there are no bridges with load restrictions.</li><li>• Parking will be within driveways and/or parking will not obstruct minimum paved width (as per Table 4.1 of PBP)</li></ul> <p>It is advised that occupants and site managers should complete a Bush Fire Survival Plan as formulated by the NSW Rural Fire Service and the NSW Fire and Rescue. An emergency evacuation plan is not recommended as a condition of consent.</p>
(v) Ongoing management of APZs	From the commencement of construction and in perpetuity, APZs are maintained in accordance with the NSW RFS document 'Standards for asset protection zones'.
(vi) Utility services	<p>For each lot, a dedicated accessible water supply must be located on each lot which must meet the requirements outlined in Section 3.4.1.</p> <p>Electricity, unless supplied underground, will be supplied via overhead powerlines with 30 m pole spacing and in accordance with Energy Australia specifications (NS179,2002) and maintained according to National distribution network standards.</p> <p>Gas supplies, where installed, will be in accordance with AS/NZS 1596 (2014).</p>

## **Scope and Limitations**

This report: has been prepared by GHD for AE Design Partnership Pty Ltd and may only be used and relied on by AE Design Partnership Pty Ltd for the purpose agreed between GHD and the AE Design Partnership Pty Ltd as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than AE Design Partnership Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The measures identified in this report cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

## 6. Summary

This report consists of a bushfire risk assessment to support a proposed rezoning to facilitate a proposed fourteen lot industrial subdivision (with a vegetation reserve), at 1111-1141 Elizabeth Drive, Cecil Park, 2178 (Lot 2, Plan No. DP2954).

The report concludes that the development is on bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.

This report has considered all of the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations included in Section 5 of this report, the development is considered to satisfy the Aims and Objectives of Planning for Bushfire Protection 2006.

This report has demonstrated that the proposed subdivision can comply with the specific aims and objectives for subdivision in accordance with the requirements of PBP.

## 7. References

NSWRFS (NSW Rural Fire Service) 2005. *Standards for Asset Protection Zones*.

NSWRFS (NSW Rural Fire Service) 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers*. Prepared by NSW Rural Fire Service in cooperation with the Department of Planning.

Standards Australia 2009. *AS3959 – 2009 Construction of Buildings in Bushfire-prone areas*. Standards Australia and the Australian Building Codes Board, Sydney.

Standards Australia 2014. *AS/NZS 1596 The Storage and Handling of LP Gas*.

Standards Australia 2005. *AS2419.1 – 2005 Fire Hydrant installations – System design, installation and commissioning*

GHD

133 Castlereagh Street

Sydney NSW 2000

T: +61 2 9239 7100 F: +61 2 9239 7199 E: sydmail@ghd.com.au

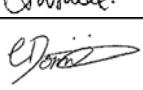
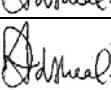
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