

BUSHFIRE PROTECTION ASSESSMENT

SECTION 96 APPLICATION FOR THE MODIFICATION TO THE APPROVED

**OAKDALE INDUSTRIAL ESTATE - SOUTH
ON**

LOT 12 in DP 1178389

&

LOT 87 in DP 752041,

KEMPS CREEK

FOR

GOODMAN PROPERTY SERVICES (AUST) PTY LTD

JULY 2016.



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Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B162718 - 1	Final	2.7.2016	13.7.2016	<i>G.L.Swain</i>

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of *Goodman Property Services (Aust) Pty Ltd*, undertook the bushfire consultancy to inform the State Significant Development Application [SSDA] for the staged development of the Oakdale South Estate [OSE] of the bushfire protection measures required for the development of the proposed Oakdale Estate South on Lot 12 in DP 1178389 & Lot 87 in DP 752041, Kemps Creek, here-in known as the 'development site'.

The Oakdale Estate - South comprises 117 hectares of land which is owned by a Joint Venture (JV) between Goodman and Brickworks Limited (Brickworks, parent company of the Austral Brick Company Pty Ltd). Goodman has entered into a JV with Brickworks to develop the Oakdale Estate into a regional warehousing and distribution hub.

The site is known as Oakdale South and comprises the second stage of development within the broader Oakdale Estate which incorporates five separate allotments, being Lots 1, 12 & 21 in DP 1178389; Lot 87 in DP 752041 and Lot 1 in DP 843901.

The development site is an irregular, upside-down L-shaped parcel which is bisected by Ropes Creek and some smaller tributaries. The development site is largely zoned IN1 – General Industrial under the WSEA SEPP but also includes large areas of land zoned E2 – Environmental Protection, associated with riparian corridors and remnant vegetation.

The State Significant Application for the Oakdale South Estate sought approval for:

An overarching planning framework to guide the staged development of the OSE including:

- An Indicative Master Plan and Structure Plan;
- Development Controls for the OSE;
- A Biodiversity Offset Strategy.

Stage 1 Development of the Estate included:

1. A package of estate-wide site preparation works to be implemented in stages including:

- Subdivision;
- Bulk earthworks (including construction of detention basins); and
- Construction of retaining walls, road and utility infrastructure/services;
- Environmental management measures and protocols for the site.

2. Development for the purposes of warehousing and distribution including:

- The construction of warehouse buildings in Precincts 1, 4 and 5;
- The construction of hardstand, loading, car parking and landscaping in Precincts 1, 4 and 5;
- The fit out and use of buildings in Precincts 1, 4 and 5 for generic warehousing and distribution uses.

The Section 96 Application seeks approval to modify the subdivision layout and construct the buildings within Precinct 1 [Buildings 1A, 1B, 1C & 1D]. The modification includes:

1. Retention of the approved Precinct 1 layout;
2. Removal of the Services Lot and re-alignment of Road No. 3, resulting in an increase in the size of Buildings 2A & 2B, within Precinct 2 ;
3. Re-alignment of the internal road beyond Precincts 1 & 2;
4. Modification to the shape of the approved Precinct 3 layout and addition of Building 3D;
5. Modification to the approved Precinct 4 and Precinct 5 layout to reduce the size of Building 5A and the number of buildings in Precinct 4 and replace them with one large building known as Building 4A;
6. Precinct 6 remains unchanged, except for the entry location from the re-aligned internal road [Road No. 1]

With the exception of some minor re-alignment within Precinct 3, the overall development precinct remains unchanged from that which was assessed in the original Bushfire Protection Assessment Report dated 28.8.2015.

The SEARS [Secretary's Environmental Assessments Requirements for Oakdale South] were issued May 2015 and did not contain matters which relate to bushfire protection.

The Penrith Council Bushfire Prone Land Map indicates that Kemps Creek contains Category 1 Bushfire Prone Vegetation within the riparian corridor to the creek.

Furthermore, the rehabilitation of the E2 zoned land is likely to increase the area of bushfire prone vegetation adjoining development.

Therefore, this report re-examines the measures required to minimise bushfire risk to the modified layout and has identified that the proposed modifications do not change the outcome/recommendations included in the original Bushfire Protection Assessment Report prepared for the SSDA.

The report has found that no modifications are required to the development proposal in order to address the provision of defensible spaces [Asset Protection Zone] to the buildings; the provision of access and water supplies for fire-fighting operations.



Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

The proposal seeks approval under Section 96 of the Environmental Planning & Assessment Act 1979 to modify the layout of the approved Oakdale South Estate [OSE] Industrial Estate on Lot 12 in DP 1178389 & Lot 87 in DP 752041, Kemps Creek.

This modification includes:

1. Retention of the approved Precinct 1 layout and construction of Buildings 1A; 1B,1C & 1D;
2. Removal of the Services Lot and re-alignment of Road No. 3, resulting in an increase in the size of Buildings 2A & 2B;
3. Re-alignment of the internal road beyond Precincts 1 & 2;
4. Modification to the shape of the approved Precinct 3 layout and addition of Building 3D;
5. Modification to the approved Precinct 4 and Precinct 5 layout to reduce the size of Building 5A and the number of buildings in Precinct 4 and replace them with one large building known as Building 4A;
6. Precinct 6 remains unchanged, except for the entry location from the re-aligned internal road [Road No. 1].

With the exception of some minor re-alignment within Precinct 3, the overall development precinct remains unchanged from that which was assessed in the original Bushfire Protection Assessment Report dated 28.8.2015.

Figure 1 – Estate Master Plan on Page 8 provides a copy of the approved Oakdale South Estate layout and Figure 2 on Page 9 provides a copy of the proposed modified layout.

Figure 1 – Approved Estate Masterplan of the Oakdale Industrial Estate – South

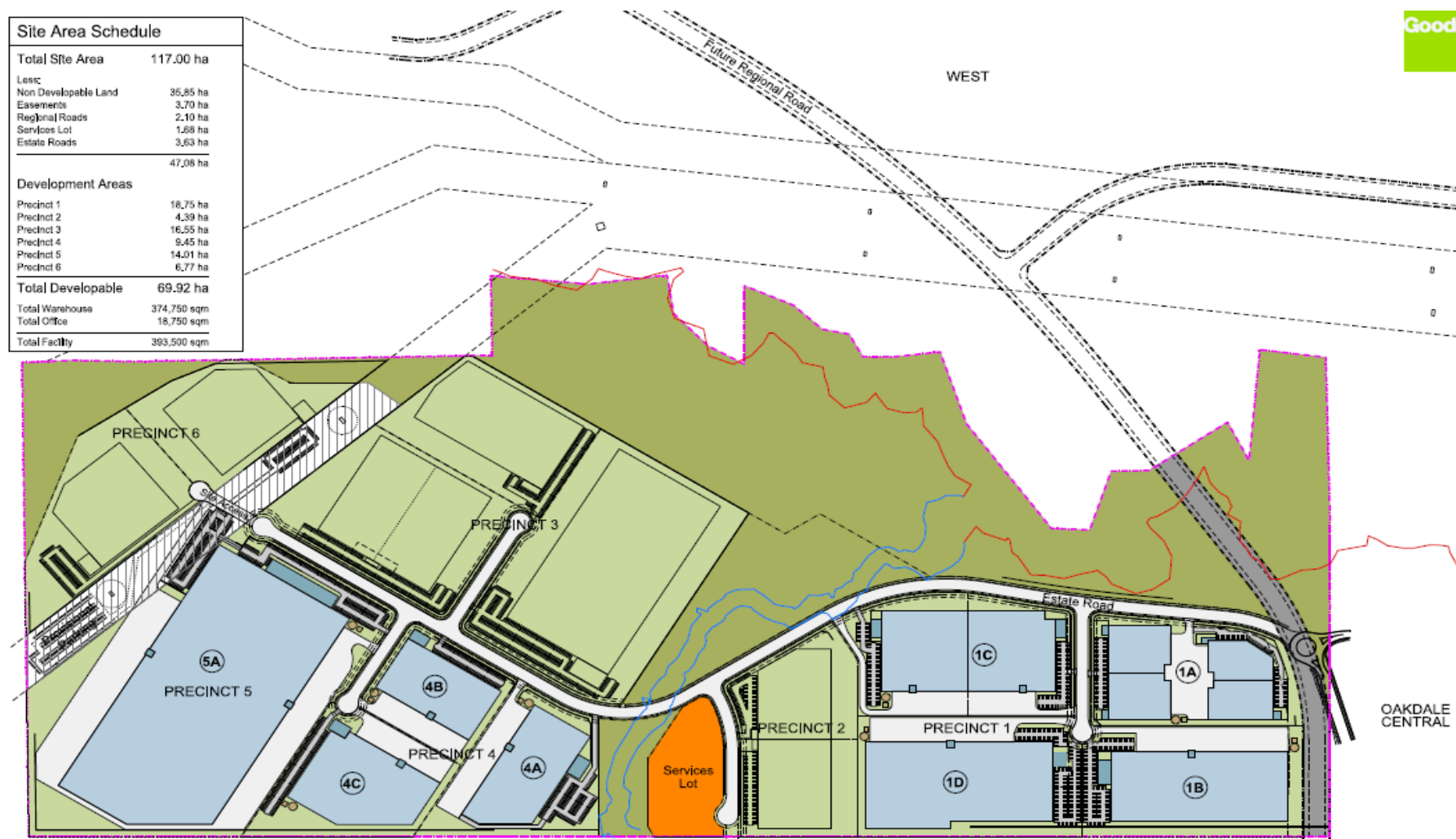


Figure 2 – Proposed modification to the approved Masterplan of the Oakdale Industrial Estate – South

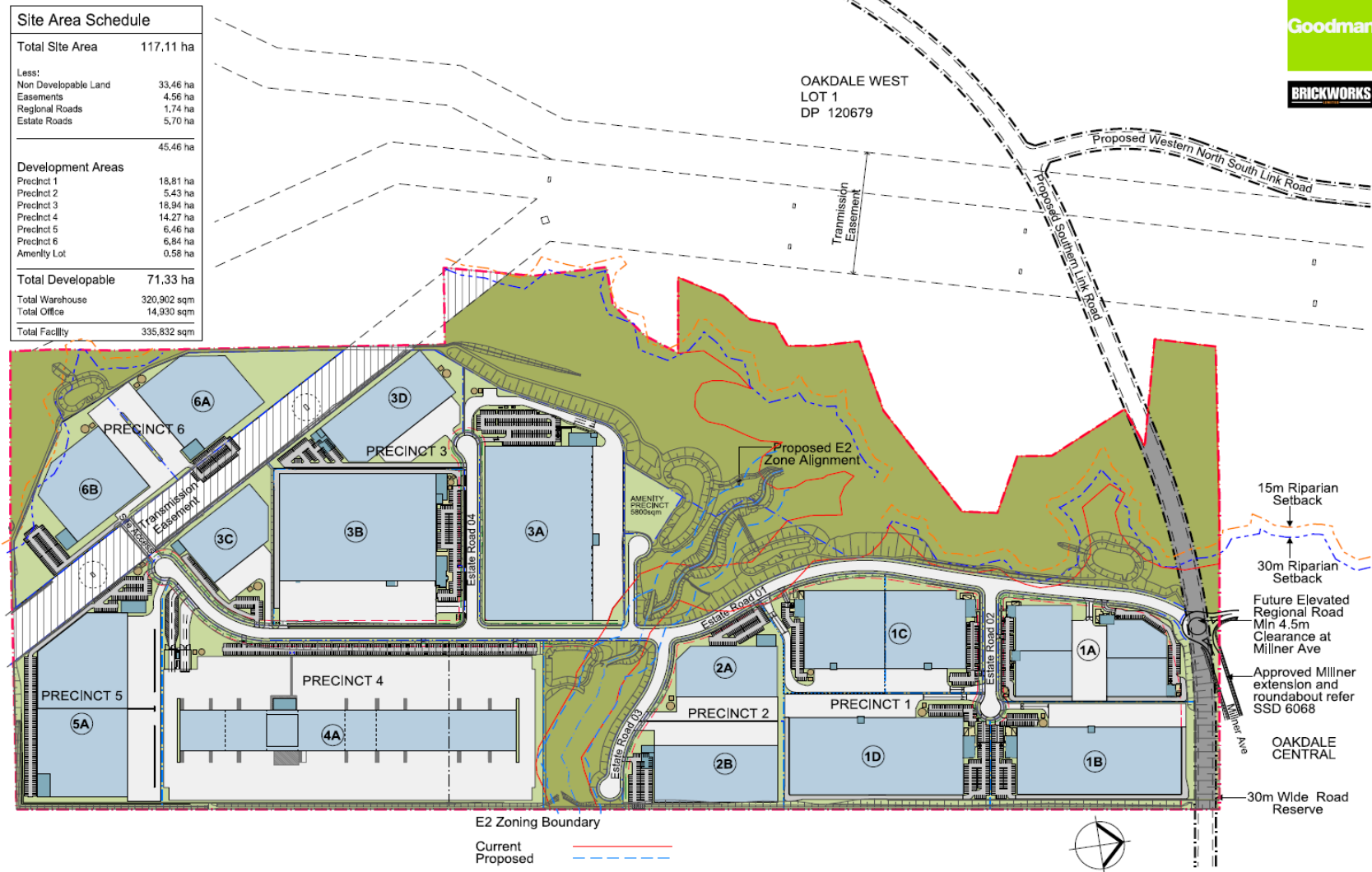


Figure 3 – Proposed Staging Plan – Oakdale Industrial Estate – South

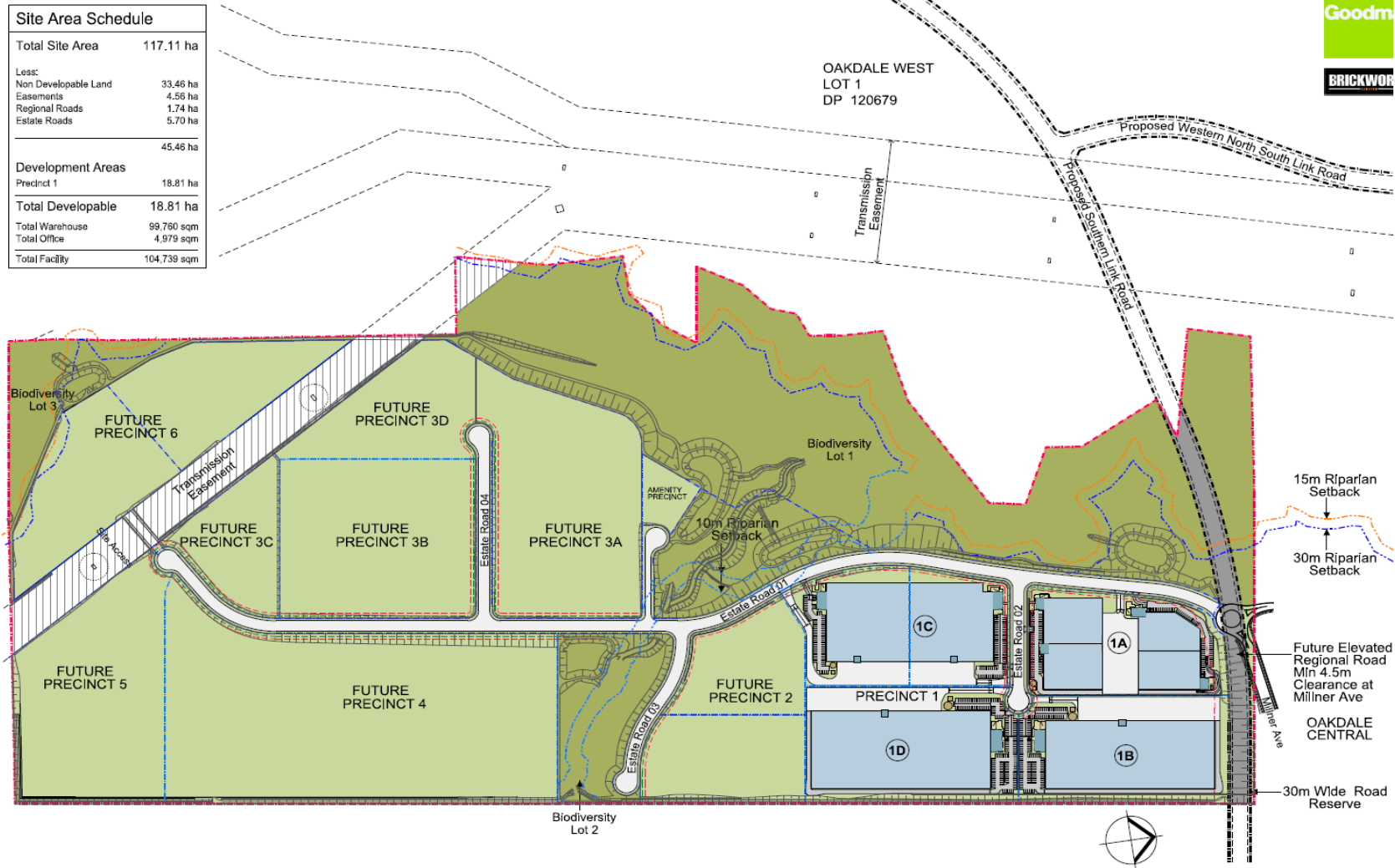


Figure 4 – Precinct 1 Plan – Oakdale Industrial Estate – South

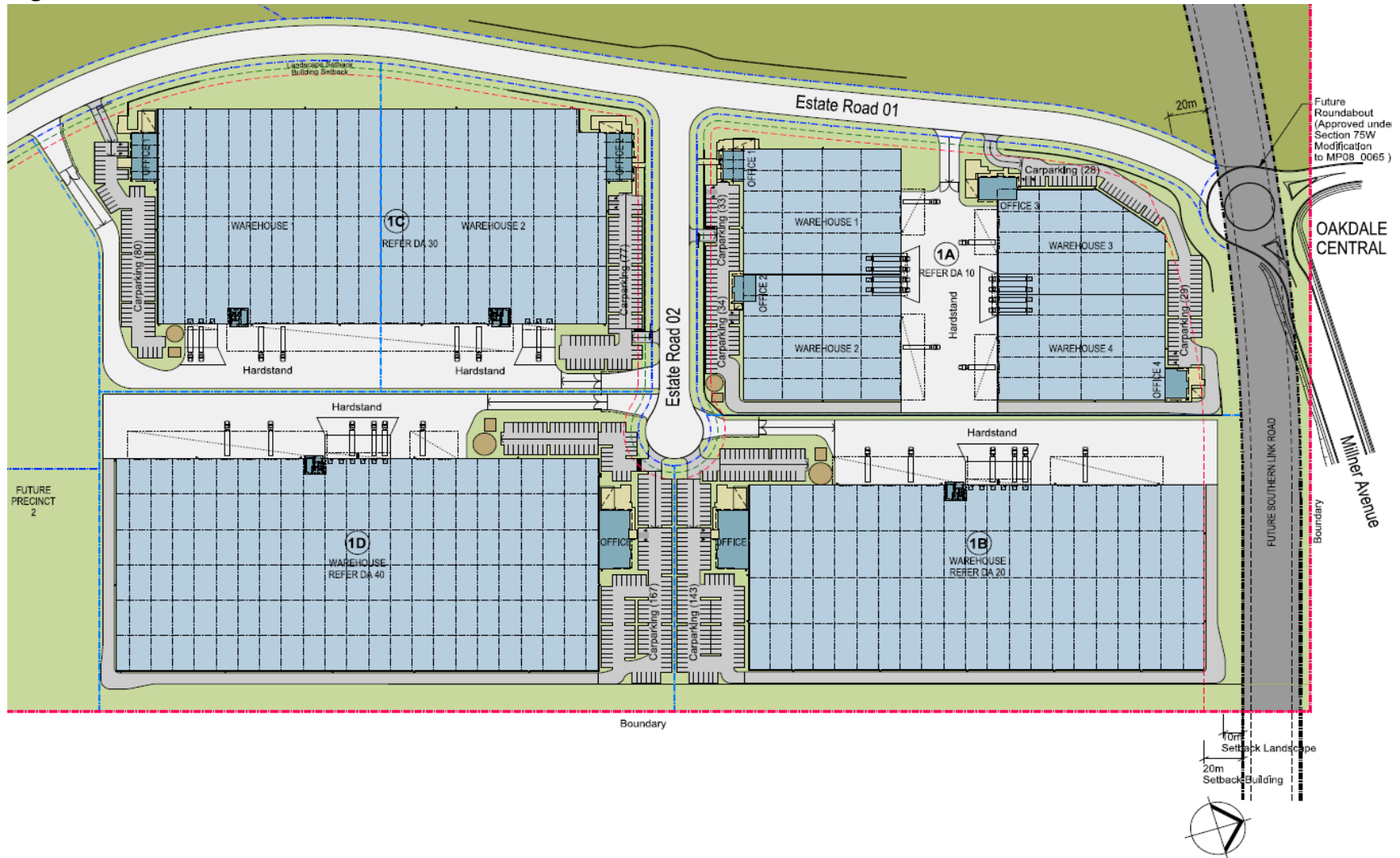


Figure 5 – Indicative Ultimate Lot Layout – Oakdale Industrial Estate – South

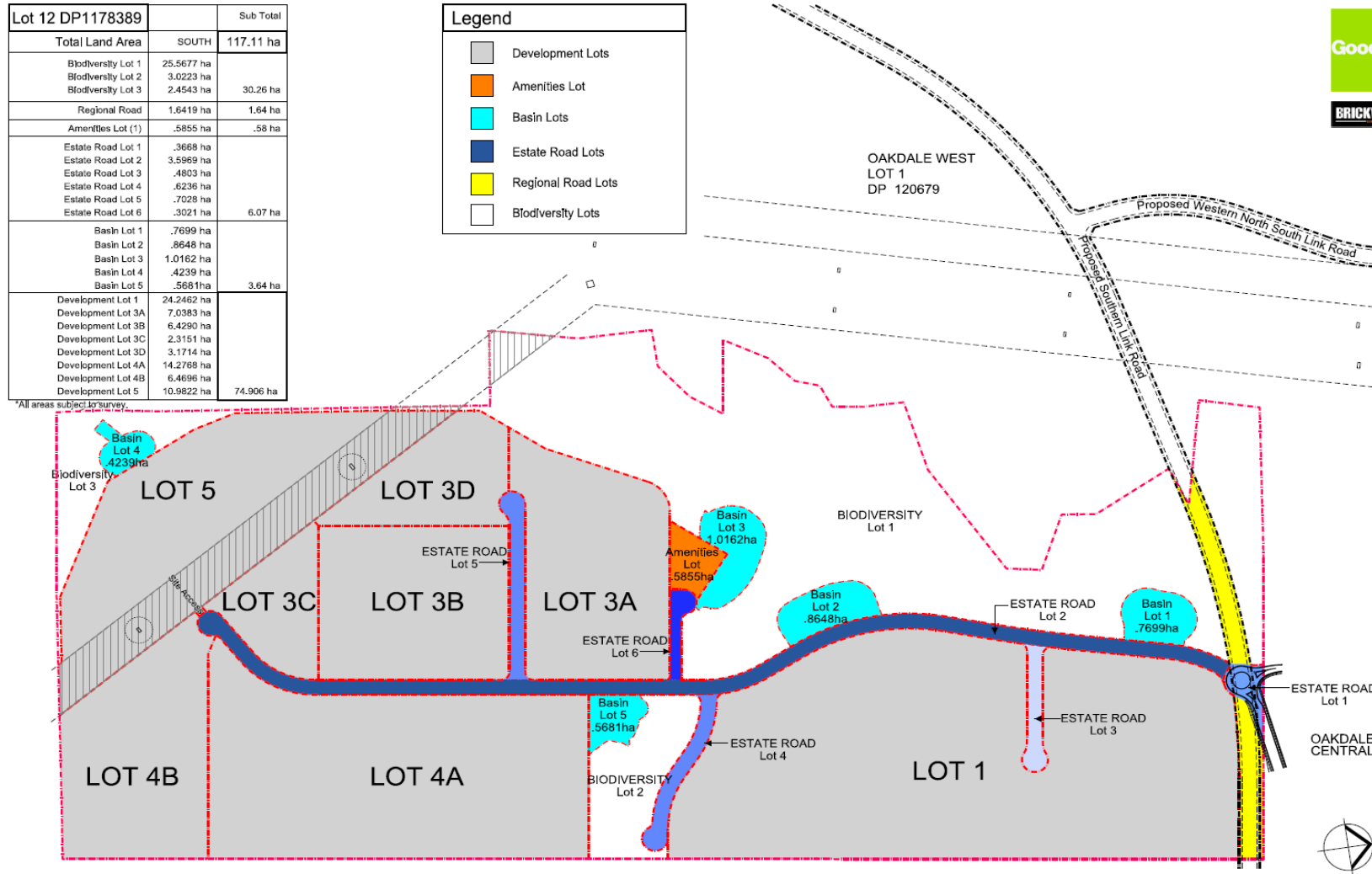
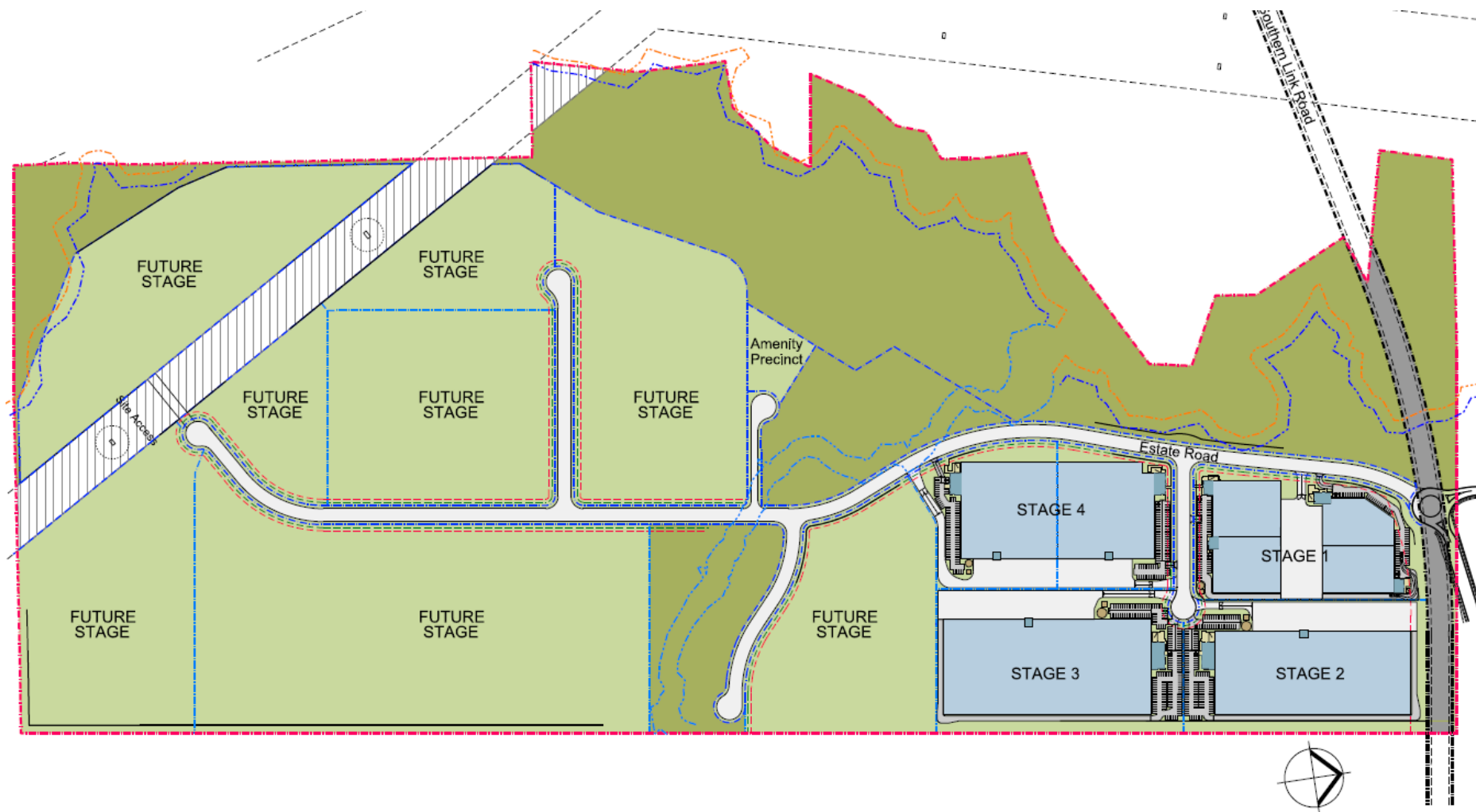


Figure 6 – Building Staging Plan – Oakdale Industrial Estate – South



1.2 Aim of this Report.

The aim of this Bushfire Protection Assessment is to examine the modified layout of the Oakdale South Estate in respect to the following matters:

- (i) The provision of building setbacks (Defendable Space) from vegetated areas and the siting of buildings to minimize the impact of radiant heat and direct flame contact;
- (ii) Fire fighting water supplies;
- (iii) Access requirements for emergency service vehicles;
- (iv) Construction standards to be used for the future buildings within the proposed development to minimize the vulnerability of buildings to ignition from radiation and ember attack;
- (v) Land management responsibilities; and
- (vi) Evacuation management.

1.3 Statutory Requirements.

This assessment has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

(a) *Environmental Planning and Assessment Act - 1979 (EPA Act)*

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1997* (EPA Act). In relation to bushfire planning for new developments (including Industrial Development) in bushfire prone areas in NSW, the following sections of the EPA Act apply:

- (i) Section 79BA requires a consent authority to determine if a proposed development that is located within a designated Bushfire Prone Area or the buffer zone to the Bushfire Prone Land complies with *Planning for Bushfire Protection 2006*;
- (ii) Section 79C(1) states “*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*”
 - *The likely impacts of the development (e.g. natural hazards such as bushfire threat);*

The suitability of a site for development (e.g. bushfires).

1.3.2 Planning Policies.

Planning for Bushfire Protection – 2006. [Rural Fire Service]

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, “*Special Fire Protection Purpose Development*” and Class 5 – 8 and 10 buildings in bushfire prone areas [Industrial buildings are Class 7 as defined by the Building Code of Australia].

These measures include the provision of defensible space requirements and access/water supply provisions to Class 5 – 8 & 10 developments in bushfire prone areas.

Provision for the assessment of construction standards to buildings and management / maintenance of the Asset Protection Zones/defensible space to buildings is also provided.

1.4 Documentation reviewed in this Assessment.

To achieve the aim of this report, a review of information relevant to the property and proposed development was undertaken. Information sources reviewed included the following documents:

- Secretary’s Environmental Assessment Requirements – May 2015;
- State Significant Development Application for Oakdale South prepared by Urban Advisory Services – November 2014;
- Master Plan; Precinct Plans and Building Plans for Precincts 1, 4 & 5 – Oakdale South prepared by SBA Architects – July 2015;
- Modified Oakdale South Estate Master Plan prepared by SBA Architects – June/July 2016;
- Site Constraints Plan prepared by SBA Architects – July 2015;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service/Planning N.S.W;
- Australian Standard AS3959 - 2009 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2013*;
- Penrith City Council *Certified Bushfire Prone Land Map*.

1.5 Site Inspection.

Graham Swain of ***Australian Bushfire Protection Planners Pty Limited*** inspected the development site on the 15th of July 2015 to assess the topography, gradients of the land within and external to the site and vegetation classification within and adjoining the development property, existing bushfire mitigation measures and a visual assessment of bushfire threat.

The land adjoining the development site was also inspected to determine the surrounding land use / land management practices and extent of bushfire prone vegetation.

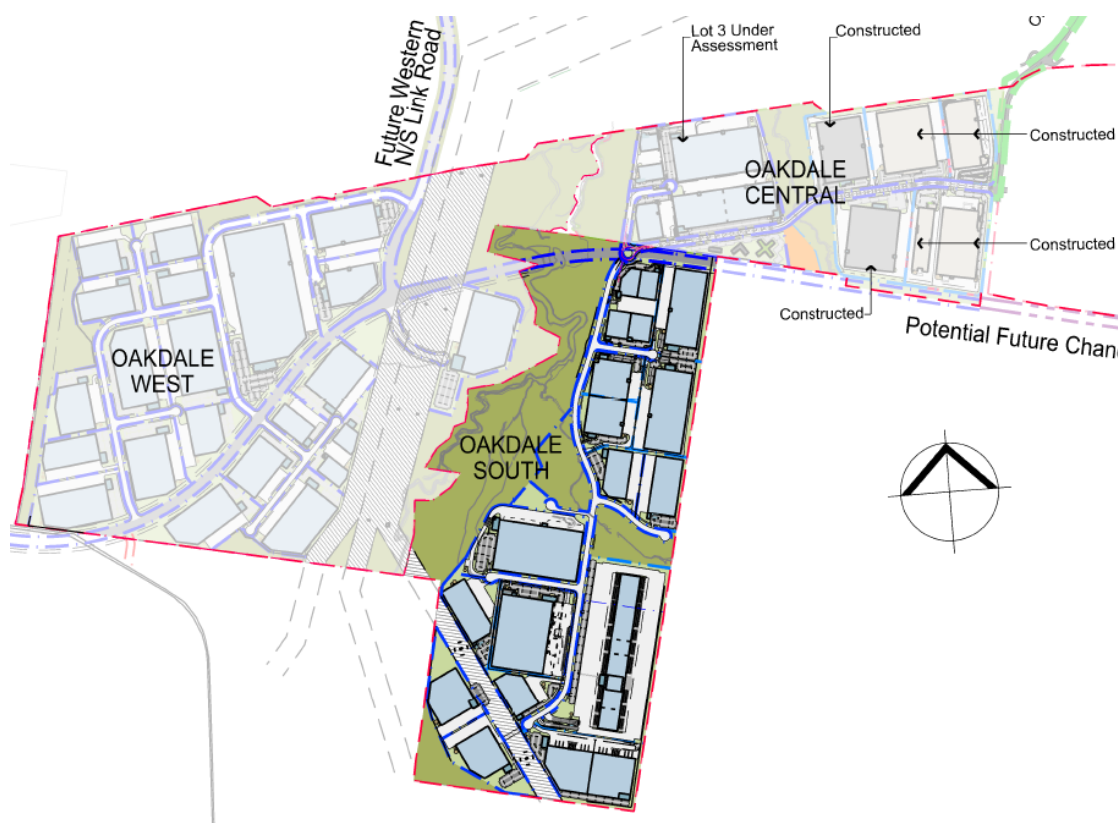
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies Lot 12 in DP 1178389 & Lot 87 in DP 752041, Kemps Creek and is located in the Local Government Area of Penrith City Council.

Figure 7 – Location of Development Site.



2.2 Existing Land Use.

The development site contains vacant grazing land used for agricultural purposes. High voltage transmission line easements traverse the site to the west and southwest from the TransGrid Substation.

2.3 Surrounding Land Use.

The landuse adjoining the boundaries of the development site is as follows:

(a) North

The land to the north of the development site contains vacant grazing land used for agricultural purposes and is zoned IN1 General Industrial under the WSEA SEPP. This land forms part of the Oakdale Central and Oakdale West industrial precincts.

The land adjoining the eastern boundary of the development site is zoned IN1 General Industrial under the WSEA SEPP. This land forms part of the Jacfin industrial precinct and is currently grazed.

The land adjoining the southern boundary of the development site consists of vacant grazing land.

The land to the west of the southern portion of the Oakdale South development site contains rural residential development having frontage to Aldington Road.

The landuse to the west of the northern portion of the Oakdale South development site consists of vacant grazing land within the Oakdale West precinct. This land is zoned IN1 and is currently being grazed.

[illegible]

2.4 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the site.

➤ ***Within the Development Site.***

The topography within the northern portion of the development site is undulating, falling to the west at less than 5 degrees towards Ropes Creek.

The topography within the southern portion of the development site is undulating, falling to the northwest and then to the west into Ropes Creek.

➤ ***Beyond the Development Site.***

(a) North.

The topography of the land to the north of the development site falls to the northwest towards Ropes Creek.

(b) East.

The topography of the land to the east [Jacfin] is undulating, rising to the east at less than 5 degrees.

(c) South.

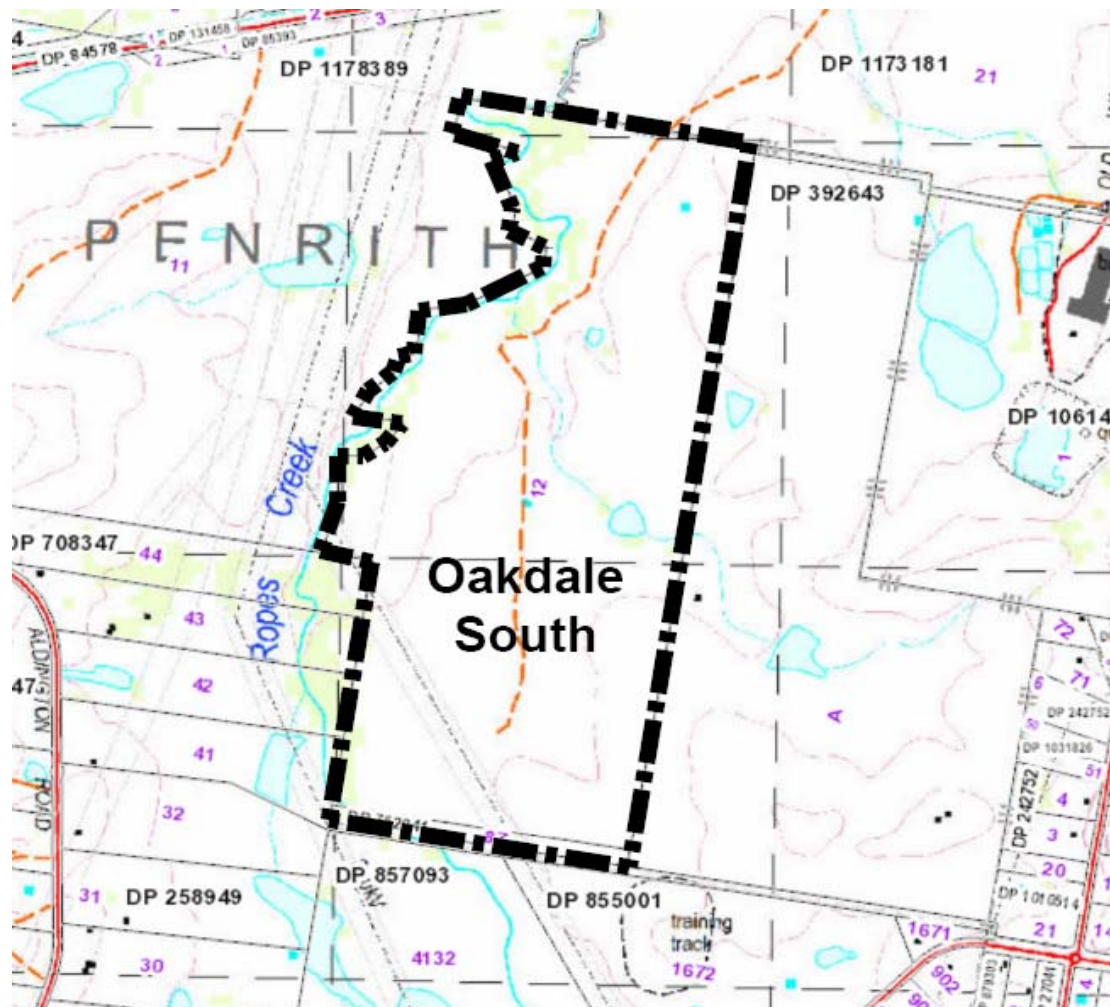
The topography of the land to the south of the development site rises to the southeast across the adjacent grazing land.

(d) West.

The topography of the land to the west of the development site, beyond the Ropes Creek corridor, rises at < 5 degrees across the existing grazing land within the rural residential landuse and the vacant land within the Oakdale West precinct.

Refer to Figure 9 – Topographic Map on Page 20.

Figure 9 – Topographic Map of development site and adjoining lands.



2.5 Vegetation within the Development Site.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the buildings. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) *Forests [wet & dry sclerophyll forests];*
- (b) *Woodlands;*
- (c) *Plantations – being pine plantations not native plantations;*
- (d) *Forested Wetlands;*
- (e) *Tall Heaths;*
- (f) *Freshwater Heaths;*
- (g) *Short Heaths;*
- (h) *Alpine Complex;*
- (i) *Semi – arid Woodlands;*
- (j) *Arid Woodlands; and*
- (k) *Rainforests.*

The ecological studies undertaken across the entire Oakdale Estate found that, in addition to exotic and native grasses, the three main plant communities that occur on the Oakdale South development site were Swamp Oak Floodplain Forest [TSC Act Listed], Cumberland Plain Woodland [EPBC & TSC Act listed] and Wetland vegetation associated with farm dams.

2.6 Vegetation within 140 metres of the Development Site.

(a) North.

The land to the north contains pasture grass with scattered shade trees.

(b) East.

The adjoining Jacfin site contains pasture grass with scattered shade trees.

(c) South.

The adjoining rural land contains pasture grass with scattered shade trees.

(d) West.

The Ropes Creek corridor contains unmanaged remnant Cumberland Plain Woodland and Swamp Oak Floodplain Forest, with a grassy understorey. The farming land to the west contains grazed grassland.

The gazetted E2 zoned land in the creek corridor will regenerate to form a forest community having a width of approximately 250 – 300 metres.

2.7 Significant Environmental Features within the Development Site.

The development site does not contain significant environmental features such as SEPP 44 Koala Habitat; SEPP 14 Wetlands; SEPP 26 Littoral Rainforests; land slip areas or National Parks Estate or areas of geological interest. E2 Environmental Protection zones are designated in the SEPP for Ropes Creek and across the site in one tributary to Ropes Creek.

2.8 Known Threatened Species, Population or Ecological Community on the Development Site.

Swamp Oak Floodplain Forest [TSC Act Listed] and Cumberland Plain Woodland [EPBC & TSC Act listed] were found within the development site and retained in the E2 zoned land.

2.9 Details and location of Aboriginal Relics or Aboriginal Place.

There are no known Aboriginal relics or Aboriginal places on the development site.

2.10 Bushfire Hazard Management within the Development Site.

The management of the landscaped gardens and the vegetation within the development site will remain the responsibility of the property owner.

A Positive Covenant, created under the provisions of the *Conveyancing Act of 1919*, shall be placed on the title of the land to ensure compliance with the management prescriptions for the Defendable Spaces detailed in this report [Refer to Section 5.2].

The management of the road verges that form part of the defendable space will remain the responsibility of Penrith City Council.

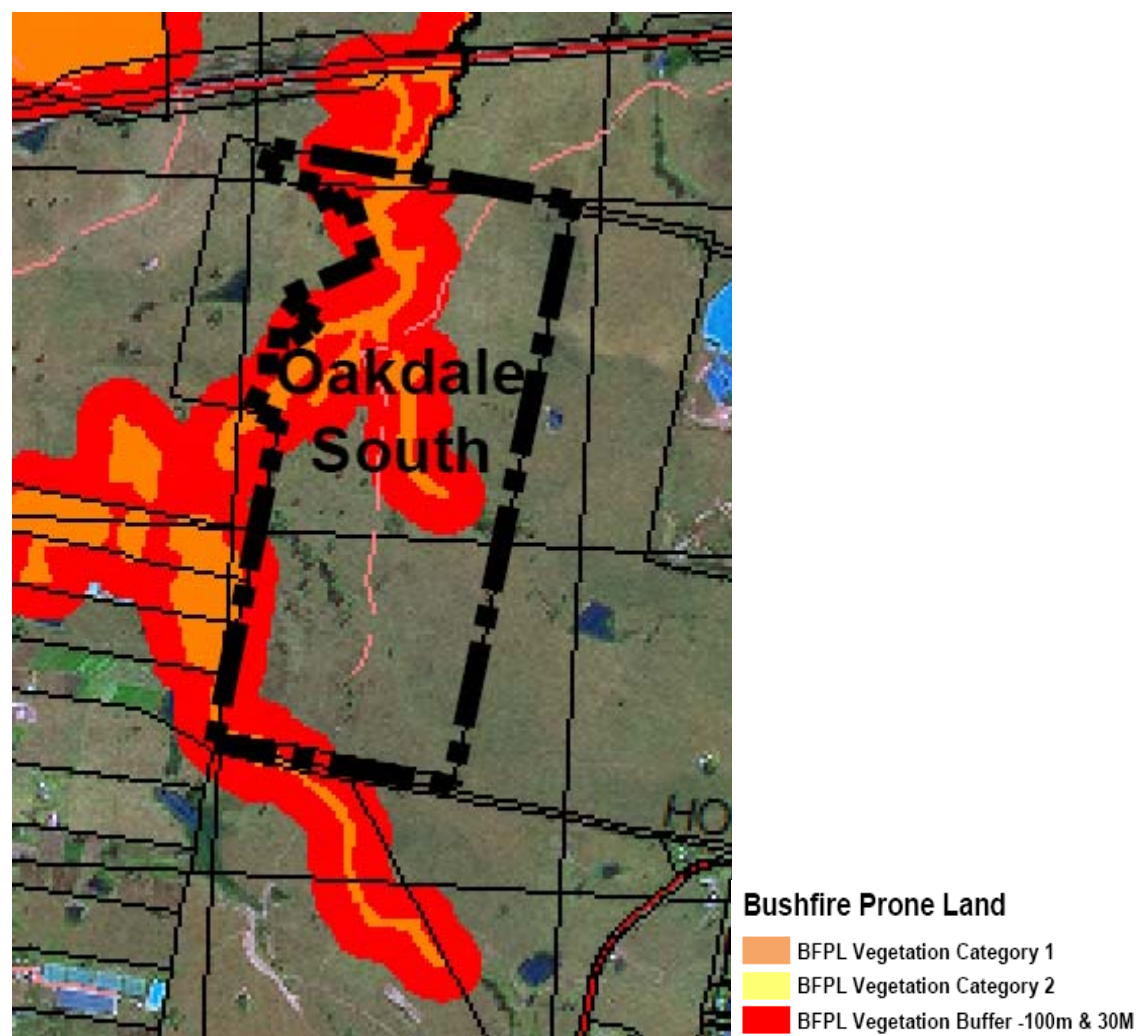
SECTION 3

PRECINCT LEVEL ASSESSMENT

3.1 Certified Bushfire Prone Land Map.

Section 146 of the *Environmental Planning & Assessment Act 1979* requires councils, where a Bushfire Risk Management Plan applies, to prepare a Bushfire Prone Land Map in consultation with the Commissioner of the NSW Rural Fire Service. The Commissioner will designate lands to be Bushfire Prone within an area and, when satisfied that the lands have been recorded on a map, will certify the map as a Bushfire Prone Land Map for the purposes of this or any other Act.

Figure 10 – Extract from the Penrith Bushfire Prone Land Map



The Penrith Bushfire Prone Land Map shows that the site is impacted by Category 1 Bushfire Prone Vegetation generally occupying the riparian zone to Ropes Creek and tributary.

The natural revegetation of the Ropes Creek E2 zoned corridor and the E2 zoned corridor to the tributary will introduce additional vegetation which will become, over the life of the development, bushfire prone.

The Ropes Creek corridor will be increased in width as part of the E2 Environmental Protection Zone and will contain bushfire prone vegetation to a width of approximately 240 – 300 metres wide.

The site inspection confirmed the potential fire hazard recorded on the Penrith Bushfire Prone Land Map.

SECTION 4

BUSHFIRE PROTECTION ASSESSMENT

4.1 Introduction.

Chapter 1 of *Planning for Bushfire Protection 2006* states that the aim of the document is to use the NSW development assessment system to provide for protection of human life [including firefighters] and to minimize impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment.

The objectives of the document are:

- Afford occupants of any building adequate protection from exposure to the impacts of a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access/egress for emergency service personnel and occupants relocating is provided and/or available;
- Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads within the Asset Protection Zone/s; and
- Ensure that utility services are adequate to meet the needs of firefighters [and others assisting in bushfire fighting operations].

In reference to the construction of the proposed Oakdale Industrial Estate - South the future warehouse buildings are classified as Class 7 buildings as defined by the Building Code of Australia [BCA].

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone vegetation, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia and states:

“The Building Code of Australia does not provide for any bushfire specific performance requirements and as such AS 3959 -1999 does not apply as a set of “deemed-to-satisfy” provisions.

The general fire safety construction provisions [of the BCA] are taken as acceptable solutions, but the aim and objectives of Planning for Bushfire Protection 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”.

“Where the aim and objectives of PfPFP [Section 1.1] are not met, then the construction requirements for bushfire protection will need to be considered on a case-by-case basis”.

“In many cases, these types of developments will require on-site parking and loading areas. In such cases, it is prudent to place these facilities in the most appropriate location in order to establish defensible space for fire-fighting purpose”.

The objectives of *Planning for Bushfire Protection 2006* are:

- (i) Afford occupants of any building adequate protection from exposure to a bushfire;
- (ii) Provide for a defensible 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;
- (v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zones;
and
- (vi) Ensure that utility services are adequate to meet the needs of fire-fighters and others assisting in bushfire fighting.

The document identifies six core bushfire protection requirements. These are:

- Provision of Asset Protection Zones / Defensible Spaces in accordance with the specific landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Access for fire fighting operations;
- Water Supplies for fire fighting operations;

- Construction standards of buildings located within 100 metres of the bushfire hazard interface, dependant on specification landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Emergency Planning;
- Landscape Management – in particular the management of the Asset Protection Zones / Defendable Spaces and residual bushfire prone vegetation.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones [defendable space] and Bushfire Attack [Construction Standards] required for **habitable buildings** in development for **residential purposes** that are designated as bushfire prone.

The document does not provide deemed to satisfy solutions for Class 5 – 8 buildings constructed in bushfire prone areas but states that where the aim and objectives of the document are not met, then the construction requirements for bushfire protection will need to be considered on a case by case basis.

The document also recommends that Class 5 – 8 and Class 10 buildings should be located to provide a defendable space setback which prevents flame contact with the structure.

Sections 5.2 and 5.3 of this report examine the Oakdale South layout in relation to the provision of a suitable “defendable space” between the bushfire hazard and the industrial buildings and the protection against the potential impacts of a future fire occurrence in the bushfire prone vegetation on the E2 zoned land/riparian corridor and provides recommendations on the bushfire protection measures required to be implemented to mitigate the potential bushfire threat.

The land to the north, within Oakdale Central and to the east, within Jacfin and also to the south contains vegetation which is grazed and therefore deemed not to be bushfire prone vegetation. These aspects of the Oakdale South development site are therefore not examined as part of the defendable space requirements.

The provision of access and water supplies for fire-fighting operations’ management of the defendable space [Asset Protection Zone] and evacuation planning are examined in Sections 4.4 – 4.9 of this report.

4.2 The provision of Defendable Space/s [Asset Protection Zones].

Table 1 examines the width of defendable space requirements to the vegetation within the riparian corridors and E2 zoned land, based on the widths required to provide a separation distance which is sufficient to minimise flame contact with the building/s and to provide a fire-fighting platform wide enough to permit the safe extinguishment of the fire after the fire front has passed.

Table 1. Determination of Defendable Space to the industrial buildings on Lot 1A; 1C; 2A; 2B; 3A; 3D; 4A; 6A & 6B.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Flame Zone Width – Table 2.4.1 A.S. 3959 - 2009	Width of Defendable Space provided to fixed assets
West of 1A; 1C; 2A	Swamp Oak Floodplain Forest	Forested Wetlands [Refer to Note 1 below]	0 – 5 degrees down slope	24 metres flame length for forest vegetation on < 5 degrees downslope ground	Minimum 26 metres to Building 1A; 1C; 2A.
North West of 3A; 3D; 6A	Swamp Oak Floodplain Forest	Forested Wetlands [Refer to Note 1 below]	0 – 5 degrees down slope	24 metres flame length for forest vegetation on < 5 degrees downslope ground	Minimum 45 metres to Building 3A & 3D; Minimum 8 metres to Building 6A.
North of 4A	Narrow corridor of Swamp Oak Floodplain Forest	Rainforest [Refer to Note 2 below]	< 5 degrees up slope	10 metres flame length for rainforest vegetation on < 5 degrees upslope ground	Minimum 25 metres to the building
North of 3A	Swamp Oak Floodplain Forest	Forested Wetlands [Refer to Note 1 below]	< 5 degrees up slope	24 metres flame length for forest vegetation on < 5 degrees upslope ground	Minimum 50 metres to Building 3A
South west of 6A; 6B	Swamp Oak Floodplain Forest	Forested Wetlands [Refer to Note 1 below]	Level	24 metres flame length for forest vegetation on < 5 degrees upslope ground	Minimum 8 metres to Building 6A & 6B
South of 2A & 2B	Narrow corridor of Swamp Oak Floodplain Forest	Rainforest [Refer to Note 2 below]	< 5 degrees up slope	10 metres flame length for rainforest vegetation on < 5 degrees upslope ground	Minimum 30 metres to the building

Note 1: For the purpose of assessing construction standards this vegetation is deemed to be 'forest'

Review of Defendable Space Provisions to the Buildings:

The assessment provided in Table 1 identifies the widths of Defendable Space setbacks required from unmanaged vegetation within the Biodiversity lot in order to minimise flame contact and also identifies the available setbacks to the proposed buildings.

Table 1 also identifies that the north-western setback to Building 6A and the south-western aspect to Building 6A and 6B does not comply with the flame zone width and these buildings will be located in the flame zone level of construction.

4.3 Construction Measures to Buildings.

Table 2 examines the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – ‘Construction of Buildings in Bushfire Prone Areas’.

Table 2 Determination of Bushfire Construction Standards to the industrial buildings on Lot 1A/1C; 2A/2B; 3A/3D; 4A; 6A & 6B

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class	Effective Slope of Land	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 – 2009
West of 1A; 1C; 2A & 2B	Swamp Oak Floodplain Forest	Forest [2010 Addendum Planning for Bushfire Protection 2006]	0 – 5 degrees down slope	Minimum 26 metres to Building 1A; 1C and 2A.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
North West of 3A; 3D and 6A	Swamp Oak Floodplain Forest	Forest [2010 Addendum Planning for Bushfire Protection 2006]	0 – 5 degrees down slope	Minimum 50 metres to Building 3A & 3D; 8 metres to Building 6A	BAL 19 to exposed elevations for building 3A & 3D. BAL FZ exposed elevations to Building BAL 6A
North of 4A	Narrow corridor of Swamp Oak Floodplain Forest	Rainforest	< 5 degrees up slope	Minimum 25 metres to the building	BAL 19 exposed elevations; BAL 12.5 non-exposed elevations
North East of 3A	Swamp Oak Floodplain Forest	Forest [2010 Addendum Planning for Bushfire Protection 2006]	< 5 degrees up slope	Minimum 50 metres to Building 3A	BAL 19 exposed elevations; BAL 12.5 non-exposed elevations
South west of 6A & 6B	Swamp Oak Floodplain Forest	Forest [2010 Addendum Planning for Bushfire Protection 2006]	Level	Minimum 8 metres to Building 6A & 6B	BAL FZ exposed elevations; BAL 40 non-exposed elevations
South of 2A & 2B	Narrow corridor of Swamp Oak Floodplain Forest	Rainforest	< 5 degrees up slope	Minimum 30 metres to the building	BAL 12.5 to all elevations

Table 2 identifies that the north-western elevation of Building 6A and the south-western elevation of Building 6A & 6B will be subject to flame contact.

The type of construction of the warehouse buildings can accommodate this level of radiant heat/flame exposure with the use of non-combustible concrete wall systems.

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 2 with the additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths/pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 2, reassessment of the construction standards shall be undertaken.

4.4 Access Standards for Firefighting Operations.

Chapter 4, Section 4.2 “Access” of *Planning for Bushfire Protection 2006* provides specifications on the access provisions for fire-fighting operations within developments which are subject to bushfire attack.

The construction of the arterial link road to the north of the site will provide vehicular access to the proposed Oakdale South Estate.

This road and the proposed internal access roads will be constructed to provide heavy rigid and articulated vehicle access to each of the proposed buildings. This internal road network provides suitable access for fire-fighting appliances similar to NSW Rural Fire Service Category 1 Tankers and Fire & Rescue NSW Composite and Aerial Appliances.

The modified Estate Masterplan identifies access to the bushfire prone vegetation within the Ropes Creek corridor and the E2 zoned corridors is provided either by a perimeter road or by vehicular access to the future buildings or parking areas incorporated into the defensible space setback.

Fire trail access is also provided to the perimeter of Lots 3A, 3D, 6A & 6B to assist in fire-fighting and fire prevention operations.

4.5 Water Supplies for Firefighting Operations.

A reticulated water supply for potable water supply and fire hydrants is to be extended into the site.

To buildings erected on Lots 3A, 3D, 6A & 6B there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

The fire-fighting water supply to the new buildings shall comply with the Building Code of Australia [BCA] and A.S. 2419.1 – 2005.

4.6 Emergency Management for Fire Protection / Evacuation.

The new buildings located adjacent to the bushfire hazard in Ropes Creek may be subject to a fire event in the creek corridor that may necessitate evacuation of the buildings therefore it is recommended that the evacuation planning process for these buildings shall also include protocols for bushfire emergencies.

Due to the low bushfire risk to the remaining facilities, not exposed to the bushfire hazard, there is no requirement for the preparation of a specific Bushfire Evacuation Plan or a Bushfire Management Plan for these buildings.

4.7 Bushfire Hazard Management.

The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on occupants and fire-fighters.

The management of the Defendable Spaces and the sites generally shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and *Standards for Asset Protection Zones*.

Management of the Defendable Spaces within the development shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings; Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

SECTION 5

BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future buildings within the proposed Oakdale Industrial Estate - South are as follows:

5.1 Strategy 1 – Defendable Space management Requirements:

Management of the defendable spaces/landscaped areas within the development site shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps];

5.2 Strategy 2 – Construction Standards to the buildings located adjacent to the bushfire hazard:

Table 3 identifies the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – ‘Construction of Buildings in Bushfire Prone Areas’.

Table 3. Determination of Bushfire Construction Standards to the industrial buildings on Lot 1A/1C; 2A/2B; 3A/3D; 4A; 6A/6B

Aspect	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 – 2009
West of 1A; 1C; 2A & 2B	Minimum 26 metres to Building 1A; 1C and 2A.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
North West of 3A; 3D & 6A	Minimum 50 metres to Building 3A & 3D; 8 metres to Building 6A	BAL 19 to exposed elevations for building 3A & 3D. BAL FZ exposed elevations to Building 6A
North of 4A	Minimum 25 metres to the building	BAL 19 exposed elevations; BAL 12.5 non-exposed elevations
North East of 3A	Minimum 50 metres to Building 3A	BAL 19 exposed elevations; BAL 12.5 non-exposed elevations
South west of 6A & 6B	Minimum 8 metres to Building 6A & 6B	BAL FZ exposed elevations; BAL 40 non-exposed elevations
South of 2A & 2B	Minimum 30 metres to the building	BAL 12.5 to all elevations

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 3 with the additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths / pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 3, reassessment of the construction standards shall be undertaken.

5.3 Strategy 3 – Water Supplies for Firefighting Operations:

The fire-fighting water supply to the proposed buildings shall comply with the Building Code of Australia [BCA] and Australian Standard A.S. 2419.1 – 2005.

To buildings erected on Lots 3A, 3D, 6A & 6B there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

5.4 Strategy 4 – Emergency Management for Fire Protection / Evacuation.

The evacuation planning process for the buildings located adjacent to the bushfire hazard shall also include protocols for bushfire emergencies.

5.5 Strategy 5 – Access Standards for Firefighting Operations.

Access to the bushfire prone vegetation shall be provided either by a perimeter road or by vehicular access to the future buildings or parking areas that are incorporated into the defendable space setbacks or by the fire trails to Lots 3A, 3D, 6A & 6B.

SECTION 6

CONCLUSION

A State Significant Development Application [SSDA] has been approved for the subdivision of the IN1 zoned land within Lot 12 in DP 1178389 and Lot 87 in DP 752041, within the Oakdale South Estate and the construction of buildings on Lots 1A; 1B; 1C; 1D; 4A; 4B; 4C and Lot 5A. The approved industrial subdivision created a total of sixteen [16] lots with an additional 'Services Lot'.

An application seeking a modification to the approved subdivision is to be lodged under Section 96 of the *Environmental Planning & Assessment Act 1979*.

The modification includes:

1. Retention of the approved Precinct 1 layout;
2. Removal of the Services Lot and re-alignment of Road No. 3, resulting in an increase in the size of Buildings 2A & 2B;
3. Re-alignment of the internal road beyond Precincts 1 & 2;
4. Modification to the shape of the approved Precinct 3 layout and addition of Building 3D;
5. Modification to the approved Precinct 4 and Precinct 5 layout to reduce the size of Building 5A and the number of buildings in Precinct 4 and replace them with one large building known as Building 4A;
6. Precinct 6 remains unchanged, except for the entry location from the re-aligned internal road [Road No. 1].

With the exception of some minor re-alignment within Precinct 3, the overall development precinct remains unchanged from that which was assessed in the original Bushfire Protection Assessment Report dated 28.8.2015.

This report has examined the Section 96 Application and concludes that the new layout provides a combination of defensible spaces [separation of the buildings from the bushfire hazard] and construction standards to the future buildings which reduce the potential bushfire risk to the occupants, visitors and fire-fighters.

The report has also found that the new layout provides satisfactory access for fire-fighting operations.

Table 4 summarises the extent to which the development conforms to the aim and objectives of *Planning for Bushfire Protection 2006*.

Table 4. Compliance with the aim and objectives of *Planning for Bushfire Protection 2006*.

Bushfire Protection Measure	Compliance with the aim and objectives of <i>Planning for Bushfire Protection 2006</i>.
Defendable Space setbacks/construction standards to future industrial buildings	The combination of a Defendable Space and construction standards to the future industrial buildings located adjacent to the bushfire hazard addresses the requirement that the occupants are afforded adequate protection from exposure to a bushfire and that the buildings will not be exposed to material ignition.
Access for fire-fighting operations	Existing public roads and proposed internal access roads comply with the specifications of Section 4.1.3(1) of <i>Planning for Bushfire Protection 2006</i> and provide satisfactory emergency access for fire-fighting appliances. Access for fire-fighting operations is provided to the perimeter lots adjoining the bushfire hazard [located within the Defendable Space setback] Positive Covenant shall be recorded on title of each lot for access for fire-fighting operations.
Water supplies for fire fighting	Hydrant supply will be installed in accordance with AS 2419.1 - 2005 – additional fire-fighting ring main and Millcock Valves to be provided to Lots 3A, 3D, 6A & 6B.
Management of the fire protection measures, including the defendable spaces	Each lot owner will be responsible for the maintenance of the recommended fire protection measures and provision of the fire access road. Positive Covenant to be recorded on title of each lot.
Emergency Management	Owners of buildings shall address protocols for the management of staff and site facilities during bushfire occurrences.

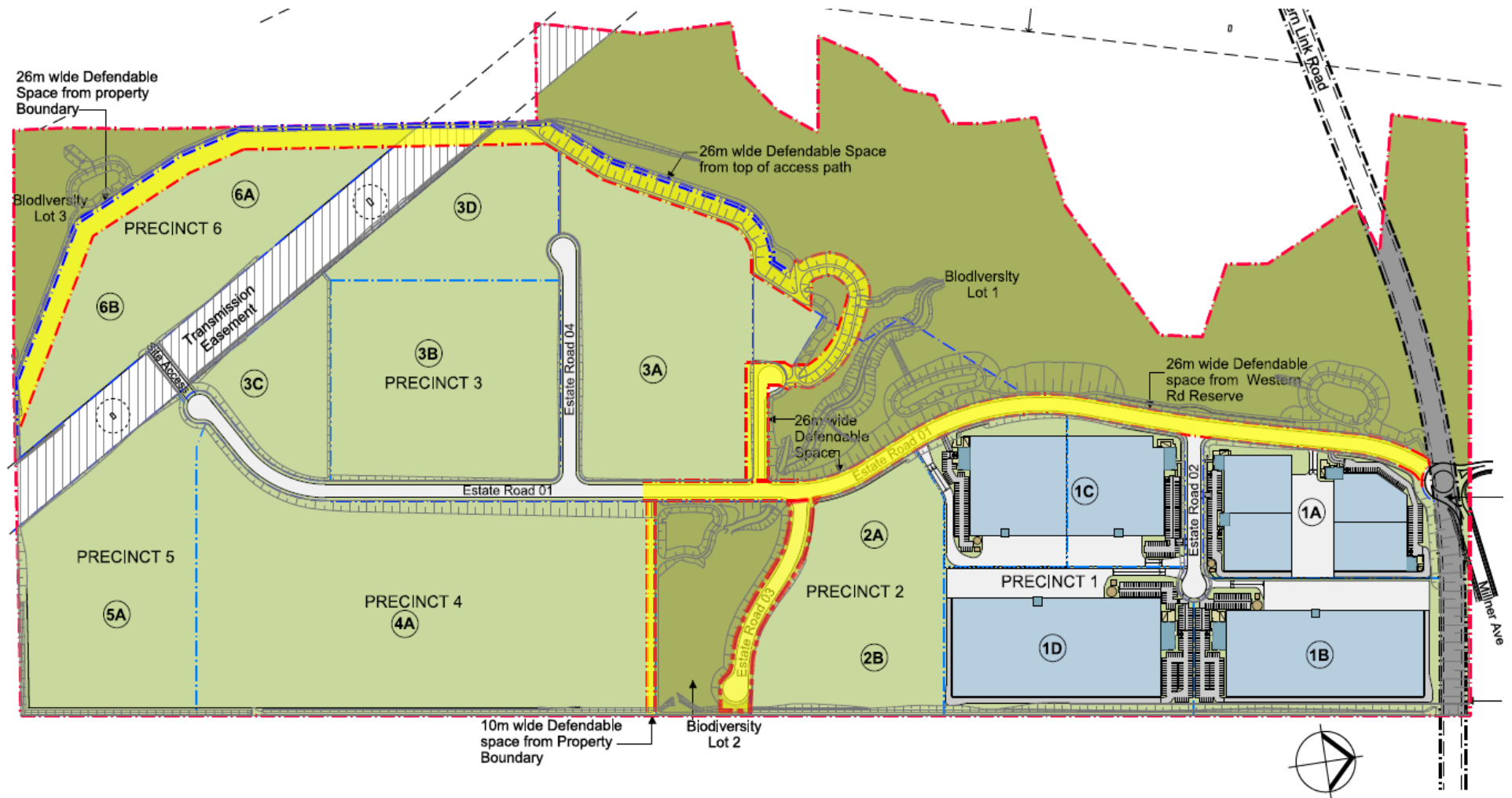
The characteristics of the site, together with the recommendations contained in this report, identify that the site is suitable in terms of its intended use.

I therefore confirm that the proposed modification to the approved layout of the industrial estate complies with the aim and objectives of *Planning for Bushfire Protection 2006* and the deemed to satisfy requirements of Section 4.3.6(f) of *Planning for Bushfire Protection 2006* – Buildings of Class 5 to 8 and Class 10 of the Building Code of Australia.



Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited.

SECTION 7 – Modified Estate Masterplan showing the minimum Defendable Space widths to the future buildings.



REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires Regulation 2013*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2015*;
- *Bushfire Environmental Assessment Code 2006*;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 - “*Construction of Buildings in Bushfire Prone Areas*”;
- *Penrith City Council Bushfire Prone Land Map*.