

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED

ROPES CREEK EMPLOYMENT PRECINCT

ON

LOT 5 in DP 262213,

ROPES CREEK

FOR

JACFIN PTY LTD

August 2010.



Australian Bushfire Protection Planners Pty Limited

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Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B101320 - 4	Final	15.7.2010	17.8.2010	<i>G.L. Swain</i>

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of *JBA Planning*, on behalf of *Jacfin Pty Ltd*, has undertaken the bushfire consultancy to inform the Concept Plan and Concurrent Project Application for Employment Lands and Stage 1 Industrial Development, under Part 3A [State Environmental Planning Policy – Major Development SEPP] of the *Environmental Planning & Assessment Act 1979*, on the bushfire protection measures required for the development of the proposed Ropes Creek Employment Precinct on Lot 5 in DP 262213, Ropes Creek. This report also provides bushfire planning advice to the Project Application for the construction of two warehouse buildings in Stage 1 of the proposed estate.

The site on which it is proposed to construct the new Ropes Creek Employment Precinct comprises 105 hectares of land which is located within Blacktown local government area and within Precinct 6 [Ropes Creek] of the Western Sydney Employment Area [WSEA]. Ropes Creek forms the site's western boundary which is also the LGA boundary between Blacktown and Penrith. The southern boundary is the Sydney Catchment Authority [SCA] water supply pipeline and to the east the site adjoins a TransGrid Substation.

The land to the north is owned by the Department of Planning.

In August 2009 the WSEA SEPP was gazetted which provides consistent zoning and development control provisions to facilitate development of the WSEA for the purpose of employment & industry. The Jacfin site is predominantly zoned IN1 General Industrial under the WSEA SEPP with E2 – Environmental Protection within the Ropes Creek corridor and the drainage corridor which crosses the site.

The Director-General's requirements for the Environmental Assessment, issued on the 12.8.2010, contain no specific 'key issues' relating to bushfire protection requirements for the Concept Plan and Project Application. The DGR's under 'Other Issues – Hazards' states 'fire risk and management' which relate to the provisions of *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*.

The Blacktown Bushfire Prone Land Map does not record the site as containing bushfire prone vegetation. However, the Penrith Council Bushfire Prone Land Map indicates that the western side of Ropes Creek contains Category 1 Bushfire Prone Vegetation within the riparian corridor to the creek whereas the Blacktown Bushfire Prone Land Map does not record similar vegetation on the eastern side of the creek as Bushfire Prone Vegetation.

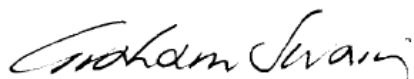
This is an anomaly between the two Bushfire Prone Land Maps as the full width of the Ropes Creek contains vegetation which is deemed to be bushfire prone vegetation, as defined by the NSW Rural Fire Service's '*Guideline to Bushfire Prone Land Mapping*'.

Furthermore, the E2 zoned corridors are likely to become a bushfire hazard to adjoining development.

Therefore, this report undertakes an assessment to examine the measures required to minimise bushfire risk on the proposed development and determines the deemed-to-satisfy bushfire protection requirements in accordance with the provisions of *Planning for Bushfire Protection 2006*, and provides recommendations on the provision of Asset Protection Zones [Defendable Spaces] to the future buildings in the Ropes Creek Ropes Creek Employment Precinct.

This report also assesses the adequacy of fire-fighting access and water supplies; construction standards of the buildings, the management of the Asset Protection Zones [Defendable Spaces] and evacuation protocols necessary to address the bushfire risk to the proposed development and to address the aim and objectives of *Planning for Bushfire Protection 2006*.

The report has found that no modifications are required to the development proposal in order to address the provision of defendable 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.

Australian Bushfire Protection Planners Pty Limited, at the request of *Jacfin Pty Ltd*, has undertaken the bushfire consultancy to inform the Concept Plan and Concurrent Project Application for Employment Lands and Stage 1 Industrial Development, submitted under Part 3A [State Environmental Planning Policy – Major Development SEPP] of the *Environmental Planning & Assessment Act 1979*, of the bushfire protection measures required for the development of the proposed Ropes Creek Employment Precinct on Lot 5 in DP 262213, Ropes Creek.

This report also provides advice on the provision of bushfire protection measures to be included in the Project Application for the construction of two warehouse buildings in Stage 1 of the proposed estate.

The site on which it is proposed to construct the new Ropes Creek Employment Precinct comprises 105 hectares of land which is located within Blacktown local government area and within Precinct 6 [Ropes Creek] of the Western Sydney Employment Area [WSEA]. Ropes Creek forms the site's western boundary which is also the LGA boundary between Blacktown and Penrith. The southern boundary is the Sydney Catchment Authority [SCA] water supply pipeline and to the east the site adjoins a TransGrid Substation.

The land to the north is owned by the Department of Planning.

Figure 1 – Concept Plan of the Ropes Creek Employment Precinct

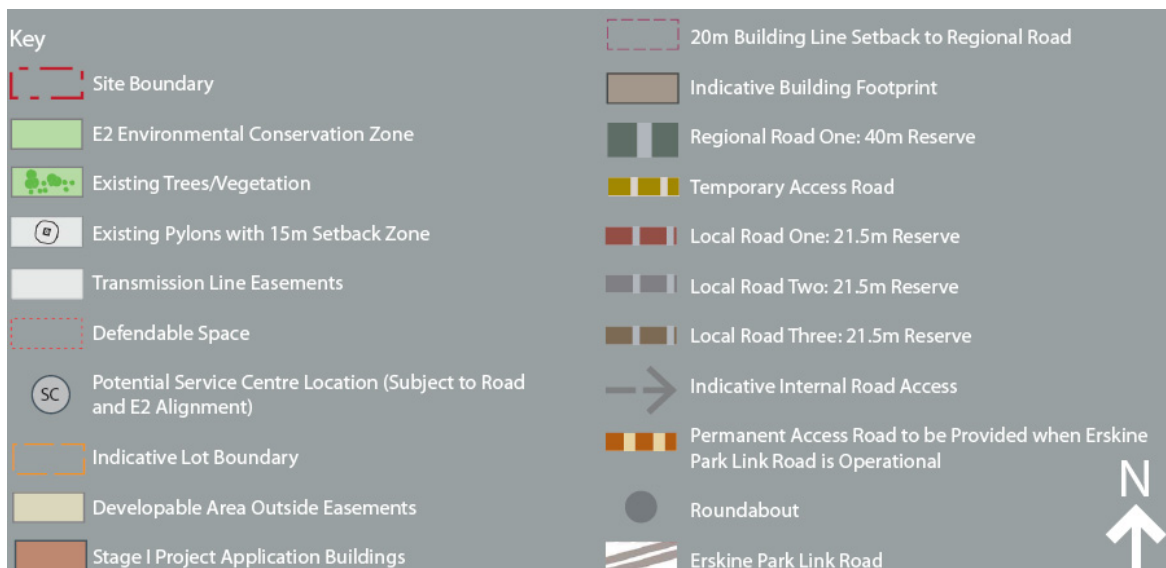


Figure 2 – Project Application – Building No. 1 Master Site Plan.

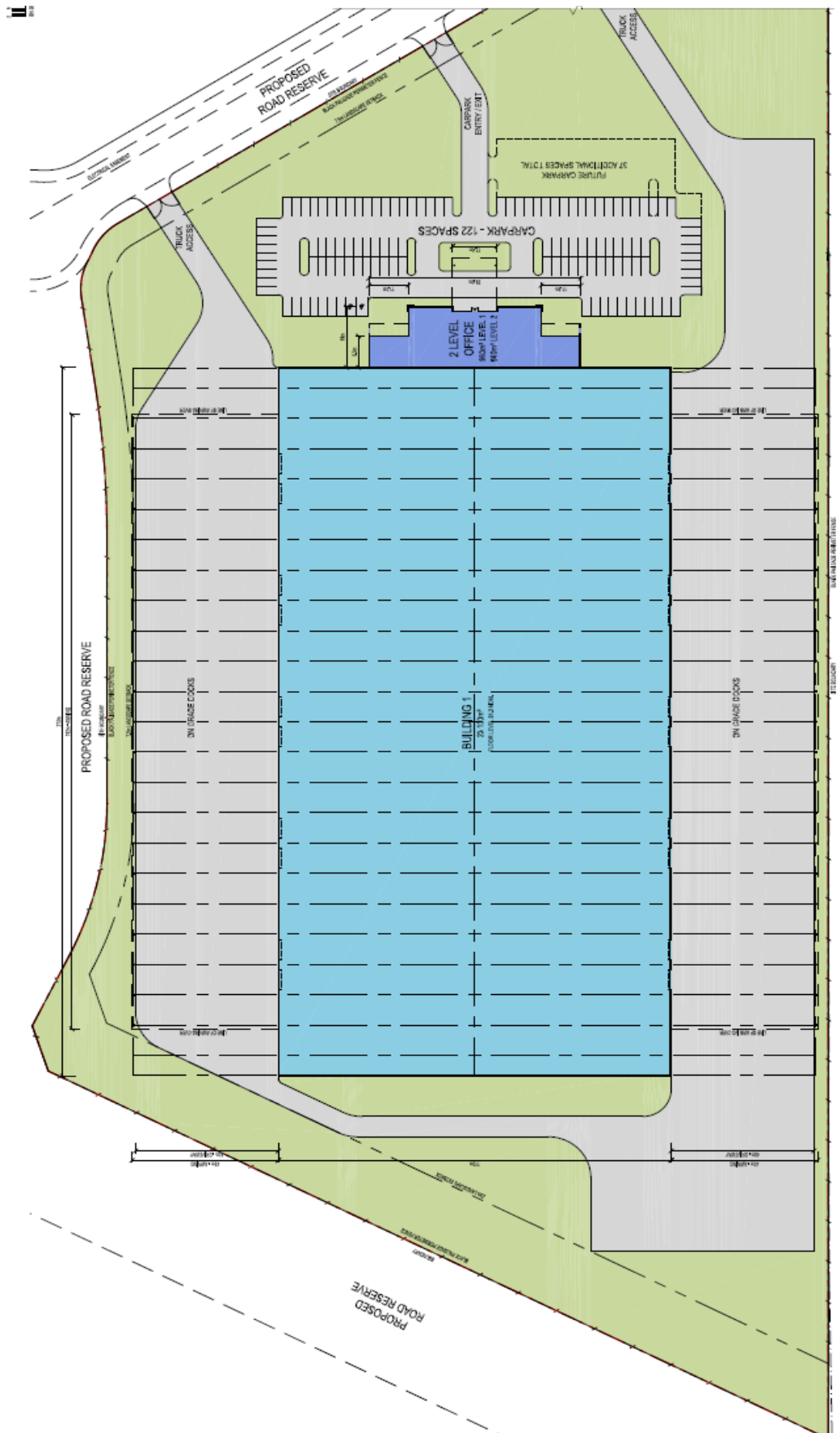
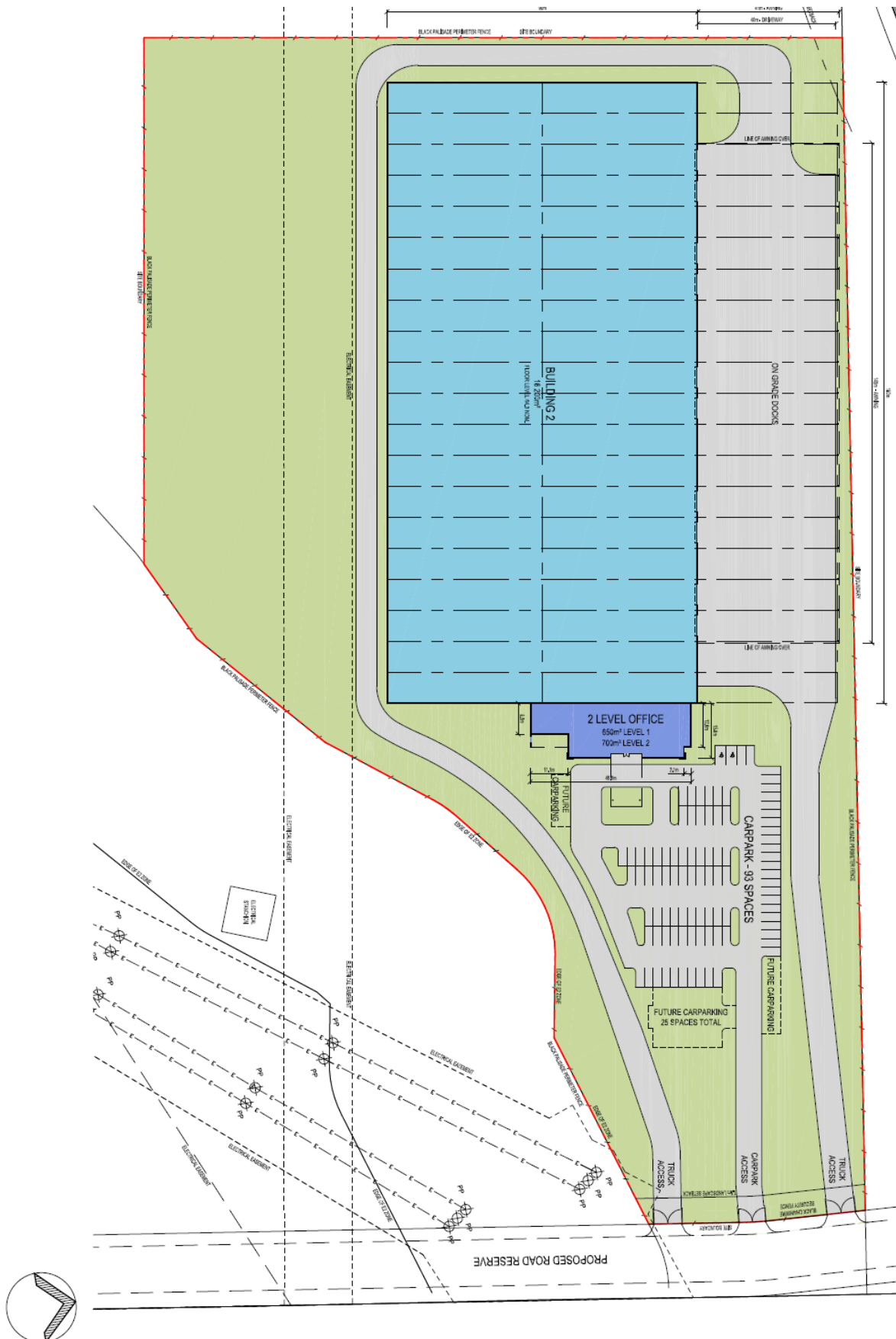


Figure 3 – Project Application – Building No. 2 Master Site Plan.



1.2 Aim of this Report.

The aim of this report is to address the Director General's Requirements [DGRs] issued on the 12.8.2010 and to prepare a bushfire protection assessment of the project in accordance with the aim and objectives of *Planning for Bushfire Protection 2006*.

1.3 Statutory Requirements.

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

1.3.1 Legislation.

Environmental Planning and Assessment Act - 1979 (EPA Act)

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1979* (EPA Act). Part 3A [Major Developments] of the Act commenced on the 1st August 2005 and consolidated the assessment and approval regime for all major developments previously addressed under Part 4 [Development Assessment] or Part 5 [Environmental Assessment] of the Act.

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*” and Class 5 – 8 and 10 buildings in bushfire prone areas [Industrial buildings are Class 7 as defined by the Building Code of Australia].

The document provides deemed-to-satisfy specifications on the provision of Asset Protection Zones to residential and “*Special Fire Protection*” developments; defensible space requirements to Class 5 – 8 & 10 developments and access/water supply provisions for 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 was undertaken. Information sources reviewed included the following documents:

- Project Briefing Notes prepared by JBA Planning – dated 17th June 2010;
- Ropes Creek Concept Plan prepared by JBA Planning – dated 6th August 2010;

- Master Site Plan – Building No. 1 & 2 Ropes Creek prepared by MNIA Architects – dated 28.07.2010;
- Director General Requirements issued on the 12.8.2010 – Concept Plan: 10_0127; Major Project: 10_0128;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service/Planning N.S.W;
- Australian Standard AS3959 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2008*;
- Blacktown City Council *Certified Bushfire Prone Land Map*;
- 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 5th of July 2010 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.

1.6 Authority Consultation.

The DGRs do not specifically require consultation with the NSW Rural Fire Service in order to obtain advice on bushfire protection measures to the development. Therefore, the recommendations provided in this report are drawn from the NSW Rural Fire Service's *Planning for Bushfire Protection 2006*.

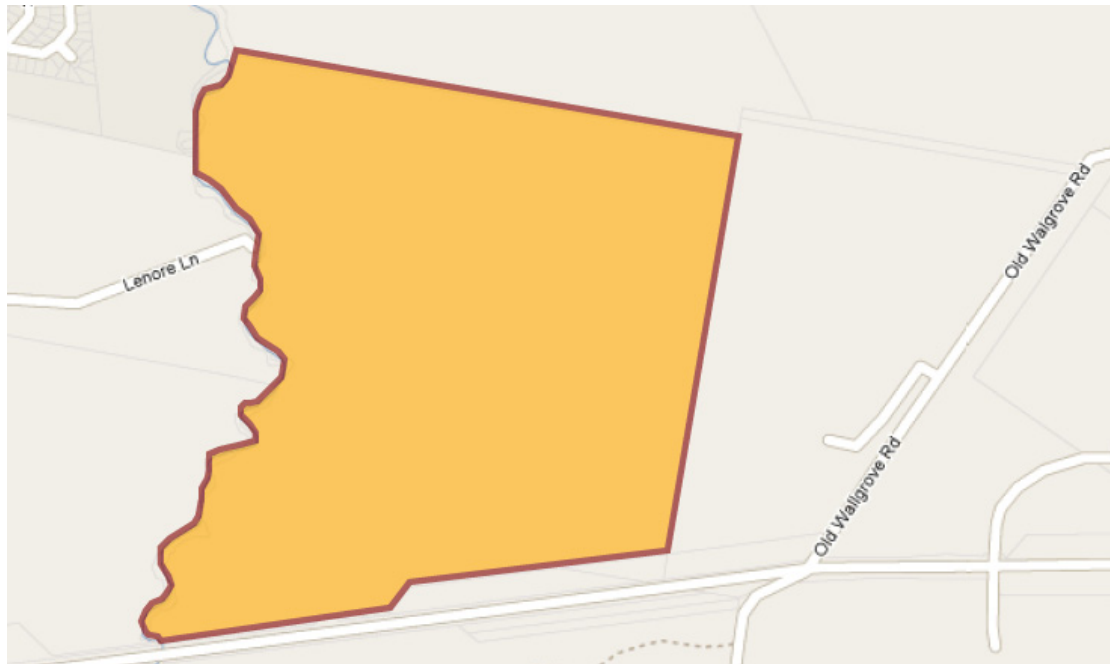
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies Lot 5 in DP 262213, Ropes Creek and is located in the Local Government Area of Blacktown City Council.

Figure 4 – 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.

(b) East

The land adjoining the eastern boundary of the development site contains the TransGrid Substation.

(c) South

The land adjoining the southern boundary of the development site consists of the Sydney Catchment Authorities Warragamba Water Supply Pipeline corridor. Beyond this corridor the land is zoned IN1 General Industrial with works commenced on an approved industrial complex.

(d) West

Ropes Creek forms the western boundary of the site with the land to the west of the creek zoned E2, Environmental Protection and IN1, General Industrial. The present landuse is grazing land used for agricultural purposes.

Figure 5 – Aerial Photograph of Site showing adjoining landuse



Source – SixViewer

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 landform within the northern portion of the development site falls to the south, from a ridgeline on the adjoining property, to the drainage corridor which flows east to west, into Ropes Creek. Beyond this drainage corridor the land generally 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 eastern and central parts of the development site rises to the north to the ridgeline whilst the land to the north of the western portion of the development site falls to the west towards Ropes Creek.

(b) East.

The topography of the land to the east of the development site, within the adjoining TransGrid Substation, rises to the east at < 5 degrees.

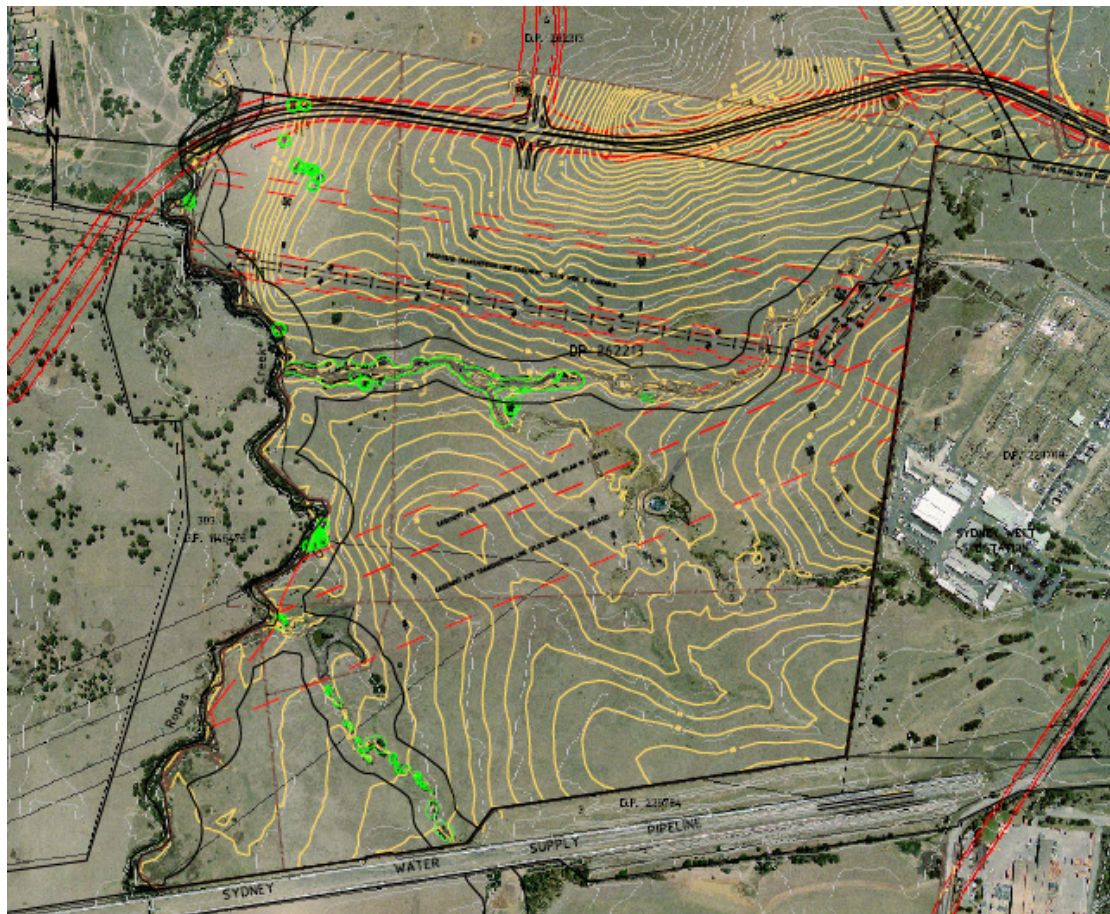
(c) South.

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

(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.

Figure 6 – 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 development site contains pasture grass with scattered shade trees.

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 TransGrid Substation contains no vegetation however the buffer zone contains grassland with scattered trees.

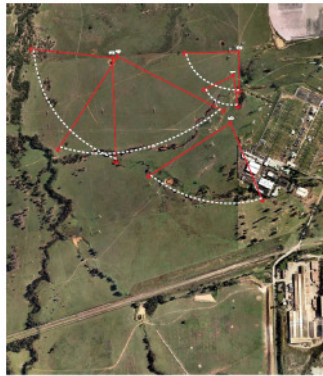
(c) South.

The adjoining Sydney Catchment Authority pipeline corridor contains managed grassland and the industrial site to the south of the pipeline easement contains grassland which will be removed as part of the future construction works of the proposed estate.

(d) West.

The Ropes Creek corridor contains unmanaged remnant Cumberland Plain Woodland and River Sheoaks, 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 Site Photographs



Ropes Creek
10216 05 July 10
JBA



2.8 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 two corridors.

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

There are no known threatened species within the development site.

2.10 Details and location of Aboriginal Relics or Aboriginal Place.

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

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Blacktown City Council.

Blacktown City Council has responsibility, under Section 66 of the *Rural Fires Act*, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard Reduction certificates for hazard reduction to be undertaken on private lands.

3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

3.3 New South Wales Fire Brigade.

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of the NSW Fire Brigade.

3.4 Blacktown Bush Fire Management Committee.

The Blacktown Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act 1997:

- **Section 52** requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.
- **Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'.

A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 Public Authorities & owners/occupiers of land.

The Rural Fires Act, 1997 provides several legislative opportunities to require Public Authorities, land owners and occupiers to manage hazardous fuels. These are listed below:

- **Section 63(1)** states that it is the duty of a public authority to take any practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of a bushfire on or from:
 - (a) any land vested in or under its control or management, or*
 - (b) any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.*
- **Section 63(2)** states that *'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'.*
- **Section 65A** states that the *'Commissioner may nominate a member of the Service as a hazard management officer'.*
- **Section 65(2)** states that *'an authorised person may, with the permission of the fire fighting authority or other authority responsible for unoccupied Crown land or managed land or a person nominated by the authority to give such permission, enter the land and carry out bushfire hazard reduction work with the assistance of such other persons as the authorised person considers to be necessary for the purpose'.*
- **Section 65(3)** states that *'the authority responsible for unoccupied Crown land or managed land is to be taken to have given the permission under this section to the extent necessary to give effect to a bushfire risk management plan'.*
- **Section 65(4)** states that *'if permission under this section is given subject to conditions, the conditions must be complied with'.*
- **Section 66(1)** states that *'a hazard management officer may, by notice in writing, require the owner or occupier [not being a public authority] of any land to carry out bushfire hazard reduction work specified in the notice on the land'.*

- **Section 66(2)** states that ‘a hazard management officer must serve a notice under this section if required to do so by a bushfire risk management plan applicable to the land that is in force’.
- **Section 66(3)** states that ‘a hazard management officer must issue a bushfire hazard reduction certificate in respect of any bushfire hazard reduction work required by a notice issued in accordance within section (2)’.
- **Section 66(6)** states that ‘the requirements and conditions so specified must include any requirements in a bushfire risk management plan that is applicable to the land and is in force and may include a requirement or condition that the burning of fire breaks or of combustible material;
 - (a) must in fire district constituted under the Fire Brigades Act 1989 be carried out by or under the supervision of the fire brigade or an officer in charge of the fire brigade;
 - (b) must outside a fire district, be carried out by or under the supervision of the rural fire brigade specified in the notice or an appropriate officer of the rural fire brigade or any hazard management officer.
- **Section 66(7)** states that ‘a notice requiring the establishment of a firebreak cannot require an occupier or owner to kill or remove any trees that are reasonably necessary for shade, shelter, windbreak or fodder purposes or the protection of threatened species, populations, ecological communities or critical habitats within the meaning of the ‘Threatened Species Conservation Act 1995’.
- **Section 66(8)** states that ‘an occupier or owner to whom a bushfire hazard reduction notice is given must, despite the fact that a fire permit has not been granted under Division 5, comply with the requirements specified in the notice’.
- **Section 70(2)** states that ‘if within the time specified in the relevant notice the owner or occupier to whom it is given fails to comply with any requirement of the notice, the Commissioner may, without prejudice to liability of the owner or occupier, enter on the land and carry out the bushfire hazard reduction work the owner or occupier was required to do under the notice’.
- **Section 70(3)** states that ‘any costs incurred by the Commissioner in carrying out such work may be recovered from the owner or occupier of the land as a debt due to the Crown in a court of competent jurisdiction’.
- **Section 87** allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding TOBAN [Total Fire Ban] days.

Section 10 permits are not required to adhere to *Part V* provisions of the EPA Act 1979 in the assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (Section 100E of the *Rural Fires Act 1997*).

3.6 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].

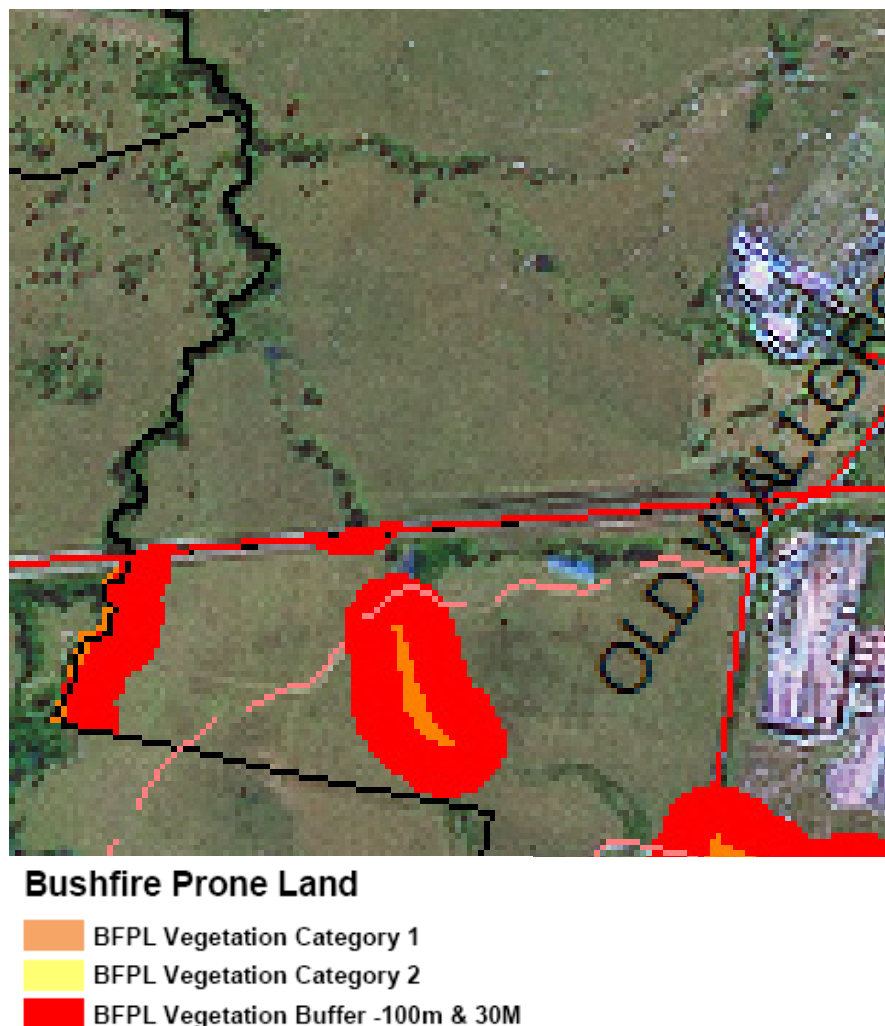
SECTION 4

PRECINCT LEVEL ASSESSMENT

4.1 Certified Bushfire Prone Land Map.

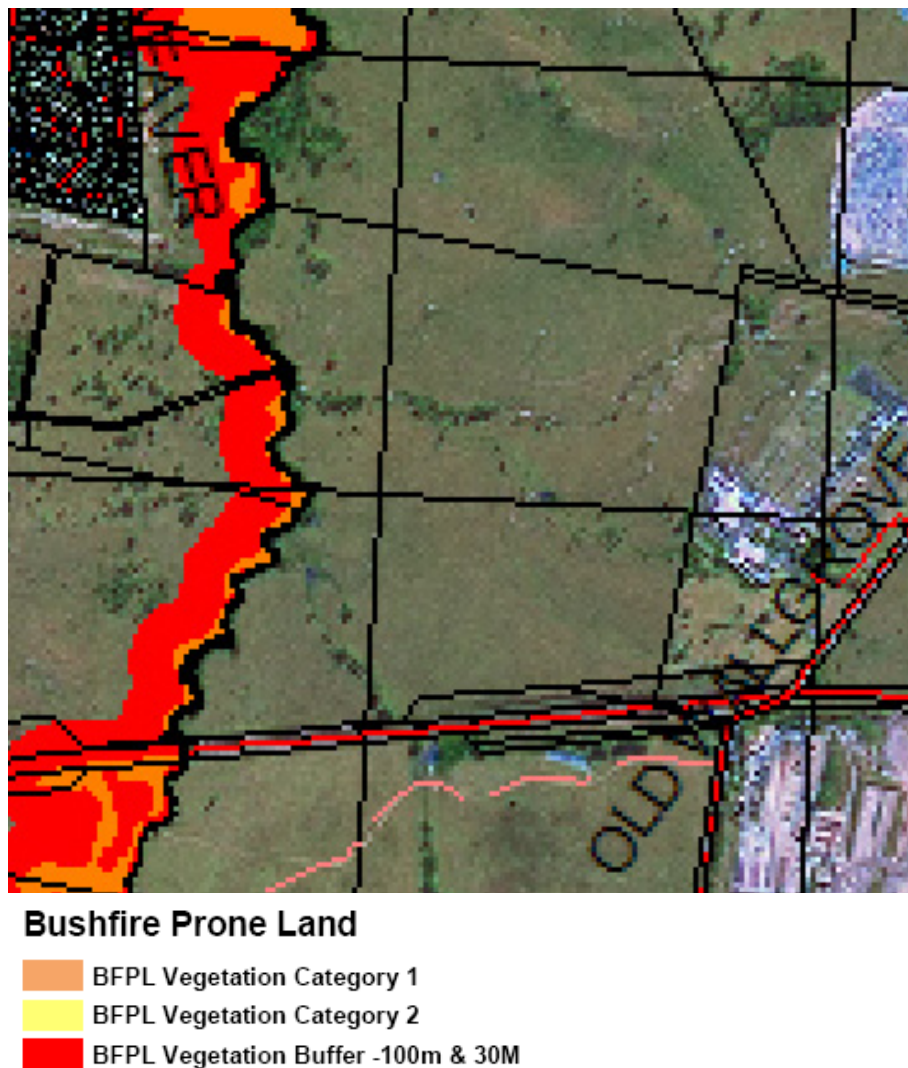
Section 146 of the *Environmental Planning & Assessment Act 1979* requires councils, where a Bushfire Risk Management Plan applies, to prepare a Bushfire Prone Land Map in consultation with the Commissioner of the NSW Rural Fire Service. The Commissioner will designate lands to be Bushfire Prone within 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 7 – Extract from the Blacktown Bushfire Prone Land Map



The Blacktown Bushfire Prone Land Map shows that the site is not impacted by bushfire prone vegetation. However the natural revegetation of the Ropes Creek E2 zoned corridor and the E2 zoned corridors within the site will introduce vegetation which will become, over the life of the development, bushfire prone.

Figure 8 – Extract from the Penrith Bushfire Prone Land Map



The Penrith Bushfire Prone Land Map records that the existing vegetation along the western side of Ropes Creek is Category 1 Bushfire Prone Vegetation. At present this vegetation extends to the top of the creek bank on the eastern side of the creek. This vegetation is not mapped on the Blacktown Bushfire Prone Land Map. 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 5

BUSHFIRE PROTECTION ASSESSMENT

5.1 Introduction.

Planning for Bushfire Protection 2006 provides deemed-to-satisfy fire protection measures for residential development [Class 1, 2 & 3 buildings]; “Special Fire Protection Developments [Hospitals, Nursing Homes / Retirement Villages / Schools / Childcare Centres & Tourist Accommodation]; Industrial / Commercial Development and residential and Special Fire Protection “infill” development.

In reference to the construction of the proposed Ropes Creek Employment Precinct 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 / Defensible Spaces and residual bushfire prone vegetation.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones [defensible 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 – 10 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.

Sections 5.2 and 5.3 of this report examine the Concept Plan layout and the location of the proposed buildings which form the Project Application in relation to the provision of a suitable “defendable space” between the bushfire hazard and the proposed buildings and the protection against the potential impacts of a future fire occurrence in the vegetation in Ropes Creek and the E2 zoned corridors within the development site and provides recommendations on the bushfire protection measures required to be implemented to mitigate the potential bushfire threat.

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 5.4 – 5.9 of this report.

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

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones) for **residential development** in bushfire prone areas:

- (a) *Determine vegetation formations as follows:*
 - Identify vegetation in all directions from the site for a distance of 140 metres;
 - Consult Table A2.1 to determine the predominant vegetation type; and
 - Select the predominant vegetation formation as described in Table A2.1.
- (b) *Determine the effective slope of the land under the predominant vegetation Class.*
- (c) *Determine the appropriate fire [weather] area in Table A2.2.*
- (d) *Consult Table A2.3 and determine the appropriate setback [APZ] for the assessed land use, vegetation formation and slope range.*

The methodology does not determine the requisite Defendable Space requirements for Class 5 – 10 developments as defined by the Building Code of Australia [BCA].

Table 1 examines the width of defensible space requirements based on the widths required to provide a separation distance which is sufficient to minimise flame contact with the buildings and to provide a fire-fighting platform wide enough to permit the safe extinguishment of a bushfire, after the fire front has passed.

Table 1. Determination of Defendable Space to the future buildings – Concept Plan Application.
Fire Danger Index [FDI] for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Available width of Defendable Space to proposed building
North	Grassland	Nil classification	5 – 10 degrees upslope to the north across the adjoining grazing land	Nil	Defendable Space to the north of the buildings provided by the Link Road on the boundary
East	Grassland	Nil classification	< 5 degrees upslope to the east	Nil	Defendable Space of > 20 metres to the east of the buildings
South	Grassland	Nil Classification	< 5 degrees upslope to the southeast	Nil	Defendable Space of > 20 metres to the south of the buildings plus managed SCA pipeline
West – to the Ropes Creek corridor	Cumberland Plain Woodland / River Sheoaks	Forest more than 250 metres wide	1 – 2 degrees downslope to the west	24 metres	Defendable Space minimum 24 metres wide provided by setback to the buildings
E2 zoned corridors	Cumberland Plain Woodland / River Sheoaks	Woodland reclassified to 'rainforest' due to width being less than 50m	1 – 2 degrees downslope	10 metres	Defendable Space minimum 10 metres wide provided by setback to the buildings

Note:

An examination of the Ropes Creek Employment Precinct Concept Plan has determined that there is a minimum available width of defendable space of 20 metres to the north of the nominated building footprints, twice the width recommended by the NSW Rural Fire Service for grassland vegetation.

A similar defendable space width is available to the east and south. The minimum separation [defendable space] width to the Ropes Creek E2 corridor is 24 metres and 10 metres to the E2 zoned corridors.

All of these setbacks exceed the minimum 'flame zone' setback widths.

Tables 2 & 3 examine the width of defendable space requirements to Building No. 1 & Building No. 2 which form the basis of the Stage 1 Project Application.

Building No. 1 occupies an area of the site within the south-eastern corner, adjacent to the eastern boundary. Building No. 2 occupies an area of the site within the north-eastern corner, adjacent to the northern boundary.

Table 2. Determination of Defendable Space to Building No. 1 in the Project Application. Fire Danger Index for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Available width of Defendable Space to proposed building
<i>North of Building No. 1</i>	Grassland in Transmission Easement	Nil classification	Level	Nil	Defendable Space of > 125 metres to the north of Building No. 1
<i>East of Building No. 1</i>	Grassland on TransGrid site	Nil classification	< 5 degrees upslope to the east	Nil	Defendable Space of 10 metres to the east of Building No. 1
<i>South & southwest of Building No. 1</i>	Grassland	Nil classification	< 5 degrees downslope to the southwest	Nil	Defendable Space minimum 55 metres provided to fence line
<i>West of Building No. 1</i>	Grassland	Nil classification	< 5 degrees downslope to the west	Nil	Defendable Space minimum 110 metres provided by setback to fence line

All of the Defendable Space setbacks exceed the minimum 'flame zone' setback widths for grassland vegetation.

Table 3. Determination of Defendable Space to Building No. 2 in the Project Application. Fire Danger Index for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Available width of Defendable Space to proposed building
North of Building No. 2	Grassland	Nil classification	5 – 10 degrees upslope to the north across the adjoining grazing land	Nil	Defendable Space of 3 metres to the north of Building No. 1 from northern boundary fence
East of Building No. 2	Grassland	Nil classification	< 5 degrees upslope to the east across the adjoining land within the TransGrid site	Nil	Defendable Space of > 300m metres to the east of Building No. 1 provided by Carpark
Southeast of Building No. 2	E2 zoned corridor	Woodland reclassified to 'rainforest' due to width being less than 50m	1 – 2 degrees downslope	10 metres	Defendable Space minimum 35 metres from the boundary fence line
South of Building No. 2	Grassland within Transmission Easement	Nil Classification	< 5 degrees downslope to the E2 zoned land	Nil	Defendable Space of > 120 metres to the south from the boundary fence line
West of Building No. 2	Grassland	Nil classification	< 5 degrees downslope to the west	Nil	Defendable Space minimum 25 metres from the boundary fence line

All of the Defendable Space setbacks exceed the minimum 'flame zone' setback widths.

5.3 Construction Measures to Buildings.

The assessment provided in Tables 1, 2 & 3 identifies that the minimum Defendable Space widths required between the future buildings and the bushfire prone vegetation in the Ropes Creek corridor and the E2 zoned corridors have been established so as to minimise flame contact with the buildings and therefore reduce the likely radiant heat exposure on the buildings to less than 40kW/m².

Should the minimum Defendable Space widths prevail, that portion of the buildings exposed to the hazard shall be constructed to the standards of BAL 40 [radiant heat flux of 40kW/m²] as defined by A.S. 3959 – 2009.

In addition, there is the possibility that burning embers from a grass/bushfire event may impact upon the buildings, particularly from the vegetation within the Ropes Creek corridor and from the surrounding grassland, prior to the adjoining land being developed. The following construction standards are therefore recommended:

- 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 paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- 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.

5.4 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.

Vehicular access to the proposed Estate will be provided with the construction of a future arterial link road to the north of the site. A temporary access road is proposed for the Stage 1 Project Application, extending from Old Wallgrove Road, along the northern boundary of the TransGrid complex thence turning south along the western boundary of the TransGrid complex to provide heavy vehicle access to proposed Buildings No. 1 & 2.

This road and the future 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 NSW FB Composite and Aerial Appliances.

Access to the bushfire prone vegetation within the Ropes Creek corridor and the E2 zoned corridors shall be provided either by a perimeter road; a perimeter fire trail/walking/cycle-way or by vehicular access to the future buildings or parking areas incorporated into the defendable space setback.

5.5 Water Supplies for Firefighting Operations.

A reticulated water supply for potable water supply and fire hydrants is to be extended into the site. Both buildings proposed in the Stage 1 Project Application will be required to address water storage for structural fire suppression and will therefore include onsite static water supply tanks for fire-fighting operations.

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

5.6 Emergency Management for Fire Protection / Evacuation.

The new buildings located adjacent to the 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 on the site there is no requirement for the preparation of a specific Bushfire Evacuation Plan or a Bushfire Management Plan for the buildings not located adjacent to the Ropes Creek corridor.

5.7 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 site 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 6

BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future buildings within the proposed Ropes Creek Ropes Creek Employment Precinct are as follows:

6.1 Strategy 1 – Defendable Space Requirements – Concept Plan

Table 4. Defendable Space to the future buildings – Concept Plan Application

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Required width of Defendable Space to proposed buildings
<i>West – to the Ropes Creek corridor</i>	Cumberland Plain Woodland / River Sheoaks	Forest more than 250 metres wide	1 – 2 degrees downslope to the west	24 metres	Defendable Space of minimum 24 metres wide
<i>E2 zoned corridors</i>	Cumberland Plain Woodland / River Sheoaks	Woodland reclassified to 'rainforest' due to width being less than 50m	1 – 2 degrees downslope	10 metres	Defendable Space of minimum 10 metres wide

6.2 Strategy 2 – Defendable Space Requirements – Project Application – Buildings No. 1 & 2

Table 5. Defendable Space to proposed Building No. 2 – Project Application

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Available width of Defendable Space to proposed building
<i>Southeast of Building No. 1</i>	E2 zoned corridor	Woodland reclassified to 'rainforest' due to width being less than 50m	1 – 2 degrees downslope	10 metres	Defendable Space of minimum 35 metres wide provided by setback from the E2 zone.

Note: There is no requirement to provide a Defendable Space to Building No. 2 in the Project Application as it is not located adjacent to bushfire prone vegetation or vegetation which will re-generate into bushfire prone vegetation.

6.3 Strategy 3 – 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];

6.4 Strategy 4 – Construction Standards to the buildings located adjacent to Ropes Creek:

Should the minimum Defendable Space widths prevail between the vegetation in the Ropes Creek/E2 zoned corridors and the adjacent buildings, that portion of the building exposed to the bushfire hazard shall be constructed to the standards of BAL 40 [radiant heat flux of 40kW/m^2] as defined by A.S. 3959 – 2009.

The following construction standards are recommended to minimise ember attack on the buildings:

- 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 paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- 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.

6.5 Strategy 5 – 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.

6.6 Strategy 6 – Emergency Management for Fire Protection / Evacuation.

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

6.7 Strategy 7 – Access Standards for Firefighting Operations.

Access to the bushfire prone vegetation within the Ropes Creek corridor and the E2 zoned corridors shall be provided either by a perimeter road, a perimeter fire trail/walking/cycle-way or by vehicular access to the future buildings or parking areas that are incorporated into the defensible space setbacks.

SECTION 7

CONCLUSION

A Concept Plan and concurrent Project Application for Employment Lands and Stage 1 Industrial Development is being sought, under Part 3A [Major Developments] of the *Environmental Planning & Assessment Act 1979*, for the construction of the Ropes Creek Employment Precinct [including construction of Buildings No. 1 & 2] on Lot 5 in Deposited Plan 262213, a 105 hectare site within the Western Sydney Employment Area.

The Director General's Requirements [DGRs] for the preparation of the Environmental Assessment for the project do not include specific 'key issues' relating to bushfire protection requirements and references 'fire risk and management' which relate to the provisions of *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*.

The Blacktown Bushfire Prone Land Map does not record the site as containing bushfire prone vegetation. However, the Penrith Council Bushfire Prone Land Map indicates that the western side of Ropes Creek contains Category 1 Bushfire Prone Vegetation within the riparian corridor to the creek whereas the Blacktown Bushfire Prone Land Map does not record similar vegetation on the eastern side of the creek as Bushfire Prone Vegetation.

Furthermore, the E2 zoned corridors within the development site will re-vegetate naturally and become a bushfire hazard to the adjoining development.

Whilst the development site is not currently deemed to be bushfire prone, the Ropes Creek corridor and the revegetated E2 corridors will contain bushfire prone vegetation and the provisions of *Planning for Bushfire Protection 2006* may be applied to the future development that adjoins this vegetation.

In this respect this report has reviewed the proposed development against the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006* and found that the Concept Plan and Project Application, for the erection of the Stage 1 Buildings, provide the appropriate defendable space between the buildings and the bushfire prone vegetation.

These setback widths exceed the 'flame zone' widths required to address the NSW Rural Fire Service's requirements for Class 5 – 10 buildings [as defined by the Building Code of Australia].

Table 6 summarises the extent to which the Concept Plan conforms to the deemed-to-satisfy specifications of *Planning for Bushfire Protection 2006*.

Table 6. Compliance with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.

Bushfire Protection Measure	Compliance with deemed-to-satisfy provisions of <i>Planning for Bushfire Protection 2006</i>.
Asset Protection Zone/Defendable Space setbacks	YES – widths of the Defendable Spaces to the proposed Class 7 Buildings exceed the minimum ‘flame zone’ setback width required by the NSW Rural Fire Service.
The siting and adequacy of water supplies for fire fighting	YES – Hydrant supply to be installed in accordance with AS 2419.2 – additional on site static fire-fighting water supply to be provided in accordance with BCA requirements.
Design of Public Roads	YES – Existing and proposed 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.
Design of Fire Trail network	Fire trail/walking paths/cycle-way network may be required to provide access to the Ropes Creek & E2 corridors [located within the Defendable Space setback]
Adequacy of emergency response access and egress	YES – Existing and proposed road network provides safe, two-way access/egress for emergency service vehicles.
Adequacy of bushfire maintenance plans and fire emergency procedures	YES – A Fire Management Plan and bushfire emergency procedures are not required for the development.
Building construction standards	YES – Construction standards recommended in order to address radiant heat levels on the buildings adjoining the Ropes Creek/E2 corridors and to minimise ember entry into the buildings.
Adequacy of sprinkler systems and other fire protection measures to be incorporated into the development	Bushfire Sprinkler Systems not applicable. BCA fire protection measures to be implemented including hydrant supply, booster system and static water supply for fire-fighting operations.
Emergency Management	No specific Bushfire Evacuation Plan is required however owners of buildings located adjacent to the Ropes Creek corridor shall address protocols for the management of staff and site facilities during bushfire occurrences in the Ropes Creek/E2 zoned corridors

REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection* 2006;
- *Environmental Planning & Assessment Act* – 1979;
- *Rural Fires Act* – 1997;
- *Rural Fires Regulation* 2008;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping* 2002;
- *Bushfire Environmental Assessment Code* 2003;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Blacktown City Council Bushfire Prone Land Map*;
- *Penrith City Council Bushfire Prone Land Map*.



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ATTACHMENT A – Concept Masterplan showing Defendable Space widths to Ropes Creek corridor and the E2 zoned land within the development site.

