

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED

**HORSLEY PARK EMPLOYMENT PRECINCT
ON**

**LOT A in DP 392643,
BURLEY ROAD
HORSLEY PARK**

FOR

JACFIN PTY LTD

November 2010.



Australian Bushfire Protection Planners Pty Limited

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Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B101320 - 5	Final	15.7.2010	25.11.2010	<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 Horsley Park Employment Precinct on Lot A in DP 392643, Burley Road, Horsley Park. This report also provides bushfire planning advice to the Project Application for the construction of a warehouse building in Stage 1 of the proposed estate.

The site on which it is proposed to construct the new Horsley Park Employment Precinct comprises approximately 100 hectares of land which is located within Penrith local government area and within Precinct 8 of the Western Sydney Employment Area [WSEA]. The northern and eastern boundaries of the site form the boundary between Penrith and Fairfield local government areas. The site lies approximately 550 metres to the south of the Sydney Catchment Authorities [SCA] water supply pipeline. To the north and west the site adjoins land managed by Goodman that also forms part of Precinct 8 of the Western Sydney Employment Area and this land is also the subject of a Part 3A approval for employment uses.

To the east, the site adjoins a PGH brickworks facility owned by CSR Limited and a number of rural residential properties to the south of the PGH facility. To the south of the site are rural residential areas known as Capitol Hill and Mt Vernon.

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 corridor which crosses the site.

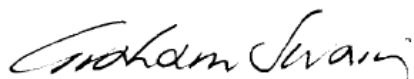
The Director-General's requirements for the Environmental Assessment, issued on the 12.8.2010, contain no specific 'key issues' relating to bushfire protection requirements for the Concept Plan and Project Application. The DGR's under 'Other Issues – Hazards' states 'fire risk and management' which relate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

The Penrith Bushfire Prone Land Map does not record the site as containing bushfire prone vegetation. However, the proposed re-vegetation of the E2 zoned corridor will introduce a corridor of bushfire prone vegetation that extends in a south-easterly direction from Ropes Creek – therefore providing a north-westerly fire path into the western portion of the development site.

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 Horsley Park 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 Application, 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 Horsley Park Employment Precinct on Lot A in DP 392643, Burley Road, Horsley Park.

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

The site on which it is proposed to construct the new Horsley Park Employment Precinct comprises approximately 100 hectares of land which is located within Penrith local government area and within Precinct 8 of the Western Sydney Employment Area [WSEA]. The northern and eastern boundaries of the site form the boundary between Penrith and Fairfield local government areas. The site lies approximately 550 metres to the south of the Sydney Catchment Authorities [SCA] water supply pipeline. To the north and west the site adjoins land managed by Goodman that also forms part of Precinct 8 of the Western Sydney Employment Area and this land is also the subject of a Part 3A approval for employment uses.

To the east, the site adjoins a PGH brickworks facility owned by CSR Limited and a number of rural residential properties to the south of the PGH facility.

To the south of the site are rural residential areas known as Capitol Hill and Mt Vernon.

Figure 1 – Concept Plan of the Horsley Park Employment Precinct

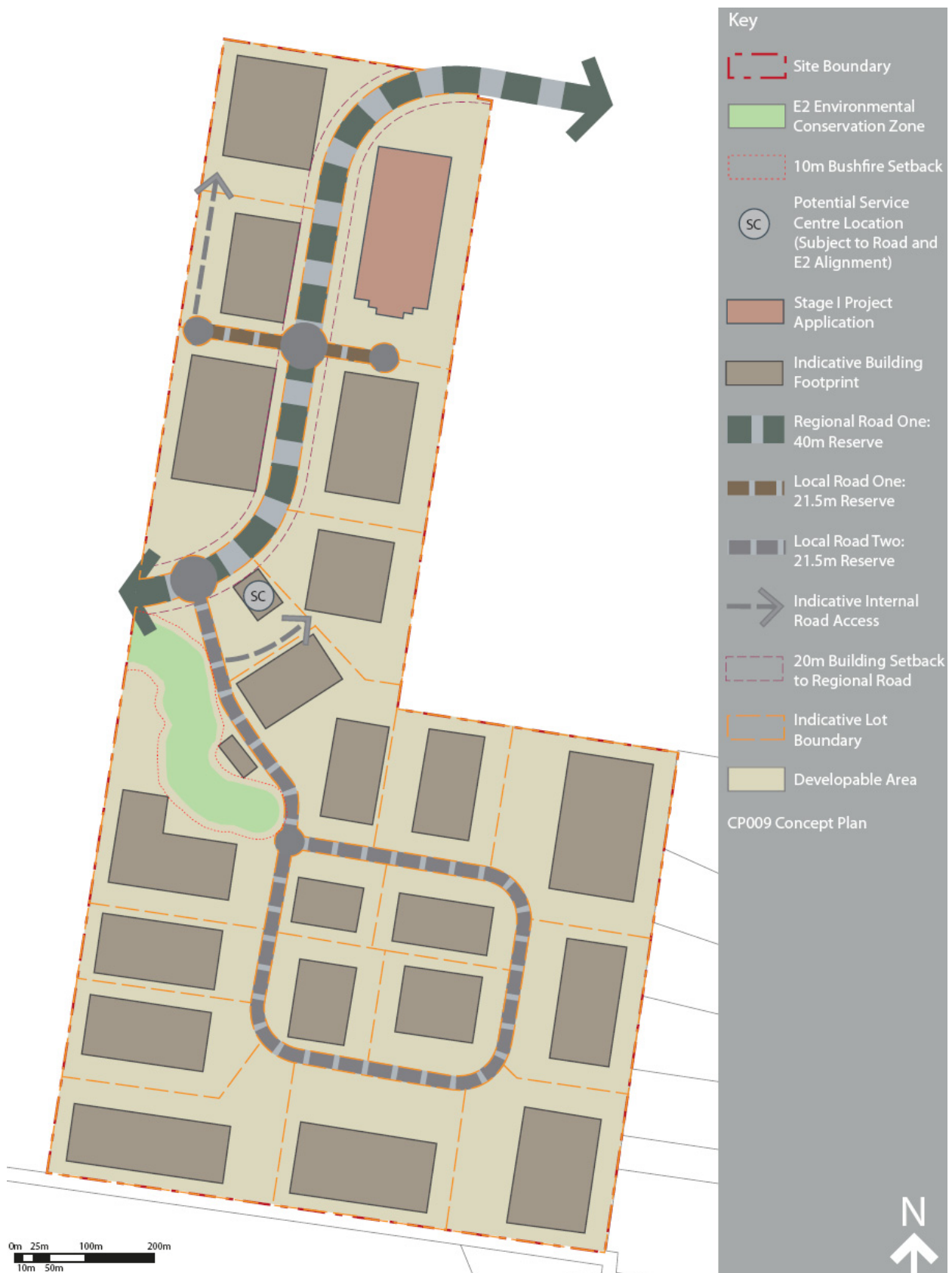
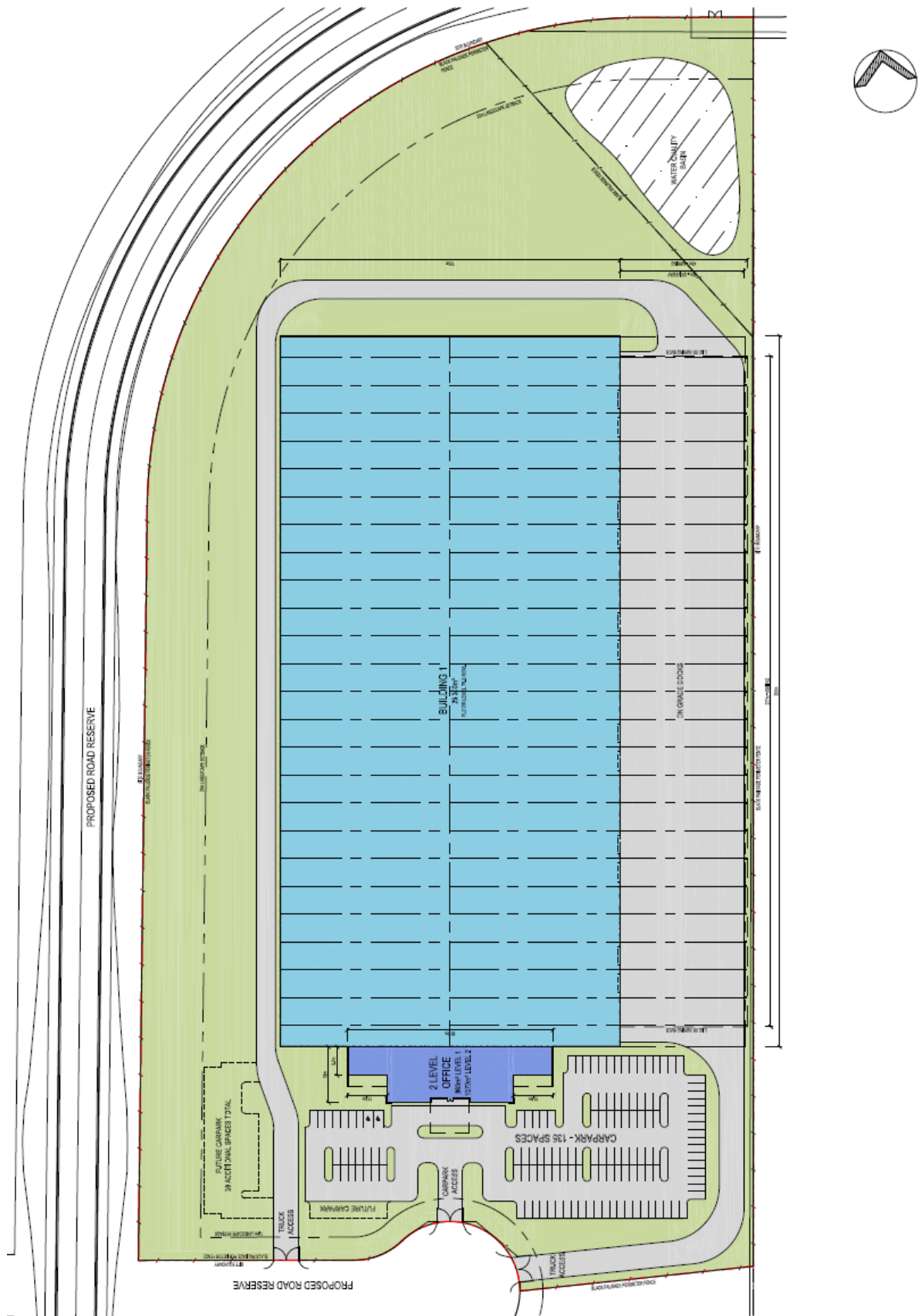


Figure 2 – Project Application – Master Site Plan Building No. 1.



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.

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 [industrial buildings are Class 7 as defined by the Building Code of Australia].

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;
- Horsley Park Concept Plan prepared by JBA Planning – dated 23rd November 2010;

- Concept Site Plan – Building No. 1 Horsley Park prepared by MNIA Architects – dated 28.07.2010;
- Director General Requirements issued on the 12.8.2010 – Concept Plan: 10_0129; Major Project: 10_0130;
- *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*;
- 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*.

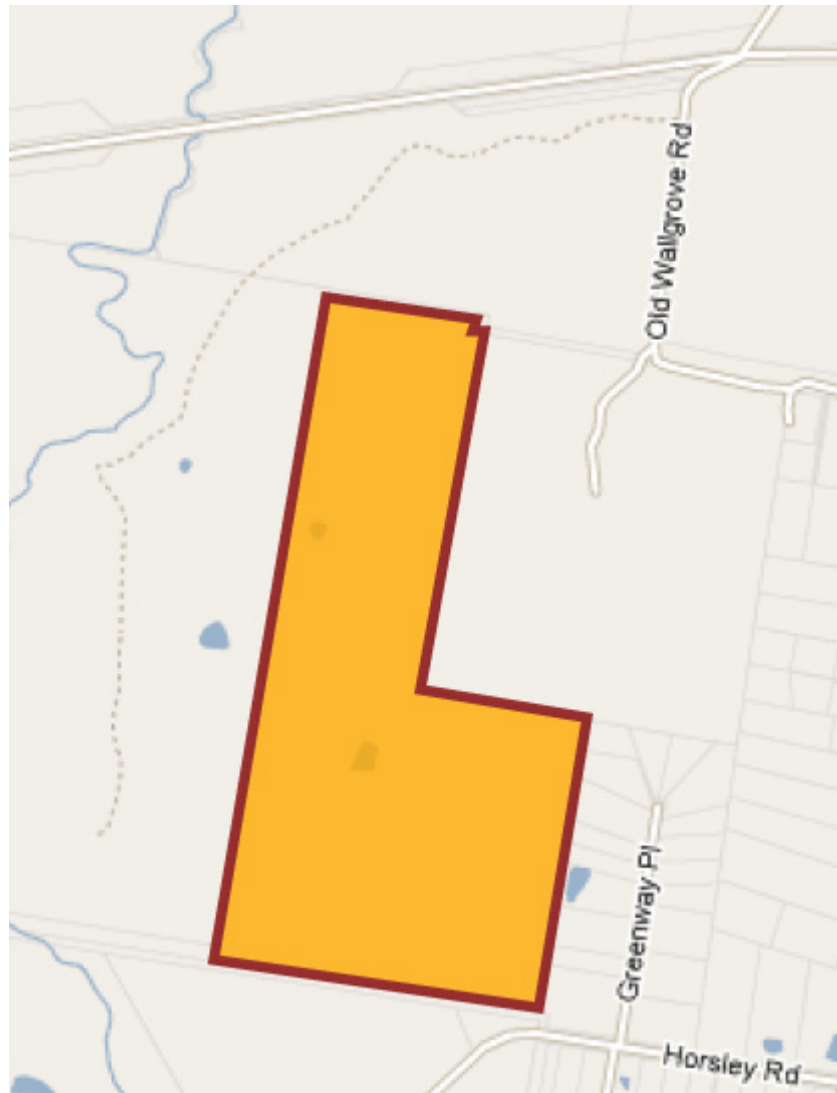
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies Lot A in DP 392643, Horsley Park and is located in the Local Government Area of Penrith City Council.

Figure 3 – Location of Development Site.



2.2 Existing Land Use.

The development site contains vacant grazing land used for cattle grazing and cropping. The only significant structure on the site is a small demountable cottage located in the southeast corner.

2.3 Surrounding Land Use.

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

(a) North & West

To the north and west the site adjoins land managed by Goodman that also forms part of Precinct 8 of the Western Sydney Employment Area and the land to the north is also the subject of a Part 3A approval for employment uses.

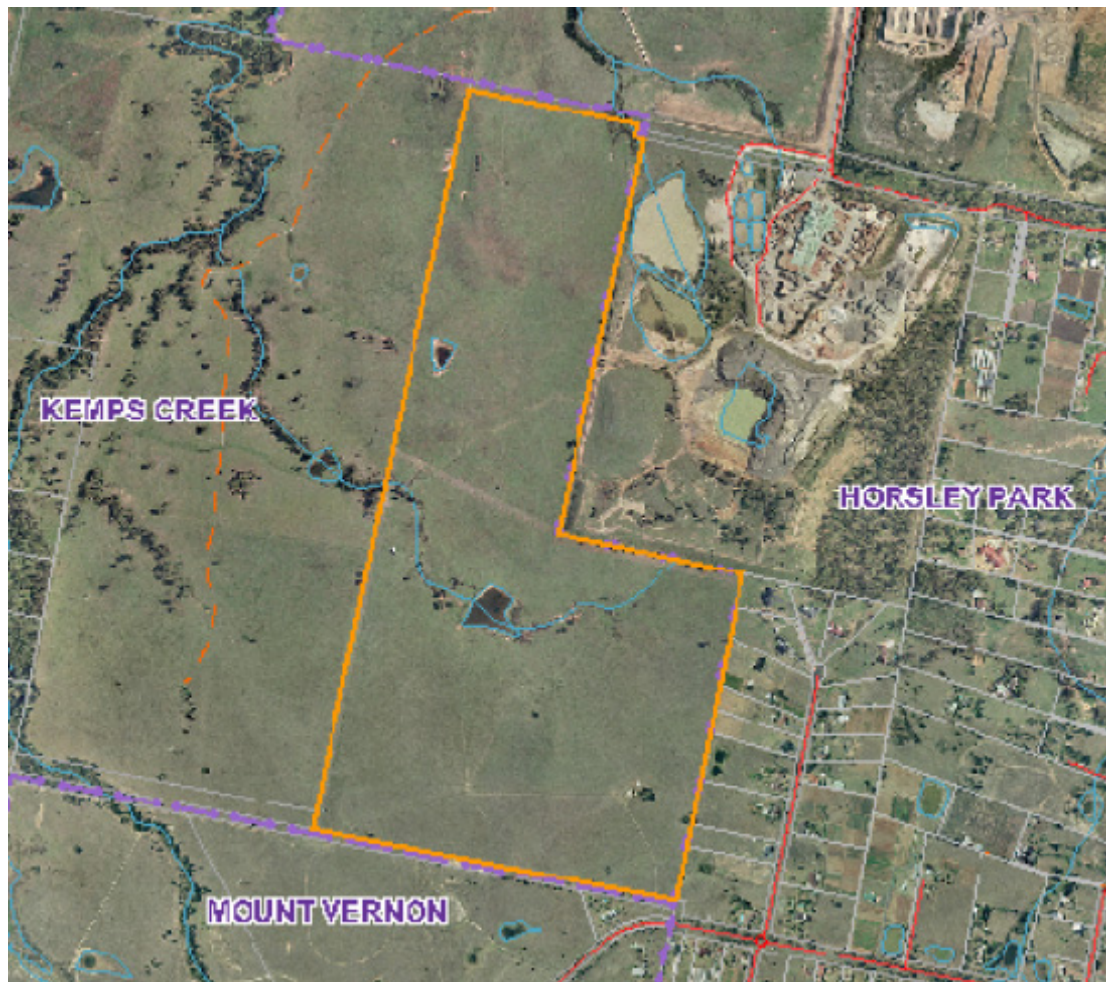
(b) East

To the east, the site adjoins a PGH brickworks facility owned by CSR Limited and a number of rural residential properties to the south of the PGH facility.

(c) South

To the south of the site are rural and rural residential areas known as Capitol Hill and Mt Vernon.

Figure 4 – 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 consists of two knolls with a connecting saddle and a ridgeline that slopes to the northwest. The land to the north of the knolls/saddle slopes to the northeast whilst to the south the land slopes towards the southwest. The southern portion of the site contains a high knoll and ridgeline which falls to the east, south and northwest to form the catchment to the existing dam which is located at the eastern extremity of the E2 zoned corridor.

➤ ***Beyond the Development Site.***

(a) North.

The topography of the land to the north of the development site falls at 2 – 3 degrees to the northwest, across the land managed by Goodman.

(b) East.

The topography of the land to the east of the northern 'leg' of the development site rises to the east to form the brick pits/dams on the CSR land. The residential land to the east of the southern portion of the site rises to a ridgeline located to the east.

(c) South.

The topography of the land to the south of the development site falls at 2 – 3 degrees to the southwest across the adjoining rural lands.

(d) West.

The topography of the land to the west of the development site falls to the west at < 5 degrees across the adjoining grazing land, towards the Ropes Creek corridor.

Figure 5 – Topographic Map of development site.



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 and sown crops.

2.6 Vegetation within 140 metres of the Development Site.

(a) North.

The Goodman land to the north contains grass which will be removed as part of the future construction of the proposed industrial development.

(b) East.

The adjoining CSR land contains grass whilst the rural residential land on Greenway Place contains landscaped gardens and managed grassland.

(c) South.

The farming land to the south contains grassland vegetation which is grazed.

(d) West.

The farming land to the west contains grassland vegetation which is grazed.

2.7 Site Photographs.



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. There is a corridor that crosses into the western part of the southern portion of the site which is zoned E2 Environmental Protection.

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 Penrith City Council.

Penrith 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 Penrith Bush Fire Management Committee.

The Penrith 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 5.7].

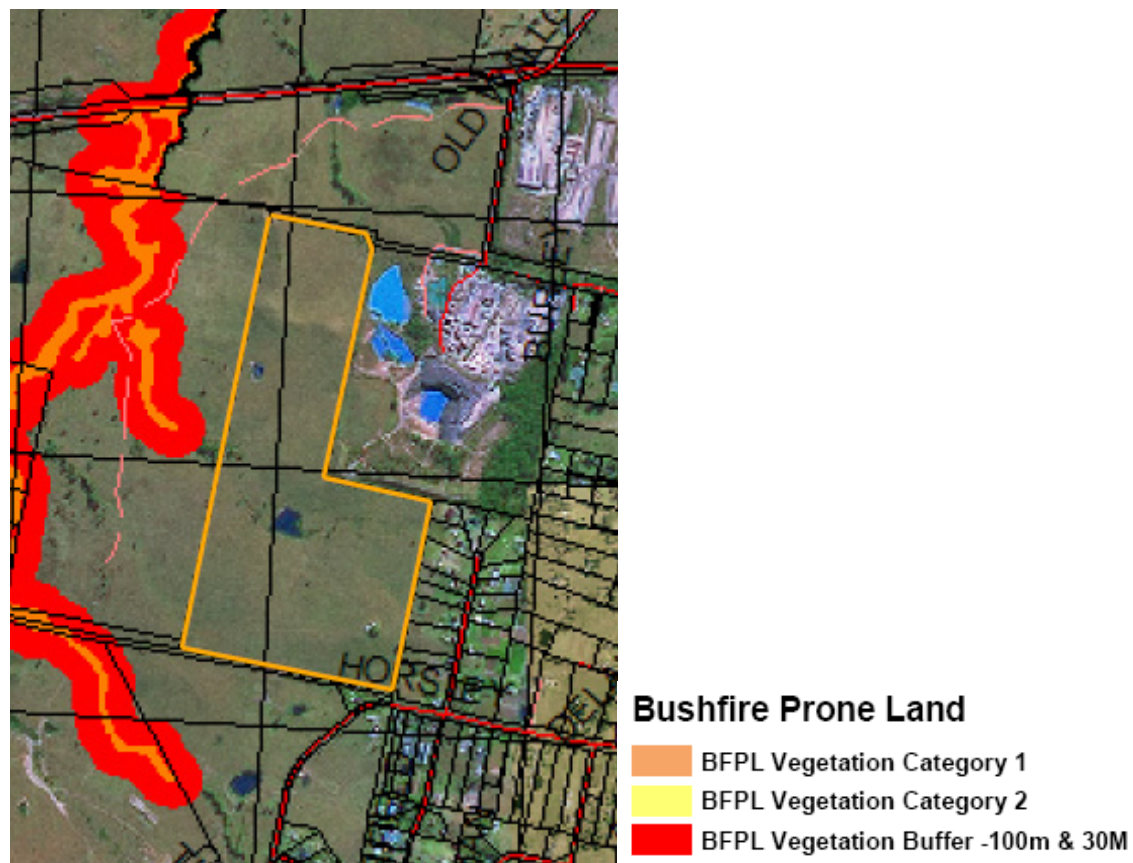
SECTION 4

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 6 – Extract from the Penrith Bushfire Prone Land Map



The Penrith Bushfire Prone Land Map shows that the site is not impacted by bushfire prone vegetation however the E2 zoned corridor within the site will introduce vegetation which will become, over the life of the development, bushfire prone.

The site inspection confirmed the accuracy of 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 Horsley Park 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 Stage 1 building, which forms 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 the E2 zoned corridor 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 defendable 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
<i>North</i>	Grassland within the Goodman Industrial site	Nil classification	< 5 degrees downslope to the northwest across the adjoining development land	Nil	Defendable Space of minimum 3 metres to the north of the buildings provided by building line setback requirements
<i>East</i>	Grassland on the CSR Brickworks site and landscaped gardens on rural residential lands	Nil classification	< 5 degrees upslope to the east	Nil	Defendable Space of minimum 3 metres to the east of the buildings provided by building line setback requirements
<i>South</i>	Grassland on rural lands	Nil Classification	< 5 degrees downslope to the southwest	Nil	Defendable Space of minimum 3 metres to the south of the buildings provided by building line setback requirements
<i>West</i>	Grassland on rural lands	Nil Classification	< 5 degrees downslope to the west	Nil	Defendable Space of minimum 3 metres wide provided by setback to the buildings
<i>E2 zoned corridor</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 minimum 10 metres wide provided by setback to the buildings

Note:

The assessment to determine the defendable space setback to the future industrial development in the Horsley Park Employment Precinct has determined that the vegetation on the lands adjoining the site is grassland which is not deemed to be bushfire prone and therefore there is no requirement to provide defendable space setbacks from the boundaries.

However, the indicative building locations provide a minimum 3 metre separation between the future buildings and the perimeter boundaries of the site.

Whilst the Penrith Bushfire Prone Land Map does not record vegetation within the site and on the adjoining lands as bushfire prone vegetation the natural revegetation of the E2 zoned corridor will introduce a narrow corridor of the vegetation which will become a bushfire hazard to the adjoining buildings. The recommended 10 metre wide defendable space provides a separation which has been established on the width of flame extension from this vegetated corridor.

Table 2 examines the width of defendable space requirements to Building No. 1 which forms the basis of the Stage 1 Project Application.

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

Table 2. Determination of Defendable Space to Building No. 1 in the Stage 1 Project Application. Fire Danger Index [FDI] 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. 1	Grassland within the Goodman Site	Nil classification	< 5 degrees downslope to the northwest across the adjoining industrial land	Nil	Defendable Space of > 20 metres to the north of Building No. 1 provided by building line setback & road
East of Building No. 1	Grassland within the CSR Brickworks Site	Nil classification	< 5 degrees upslope to the east	Nil	Defendable Space of 3 metres to awning & 40 metres to building
South of Building No. 1	Grassland on the residue land within the development site	Nil Classification	< 5 degrees downslope to the south	Nil	Defendable Space of > 70 metres to the south provided by building line setback to residual grassland vegetation
West of Building No. 1	Grassland on the residue land within the development site	Nil classification	< 5 degrees downslope to the west	Nil	Defendable Space minimum > 60 metres provided by building line setback & road to residual grasslands vegetation

There are no mandatory defendable space setbacks required for Building No1 in the Project Application.

5.3 Construction Measures to Buildings.

Table 1 identifies that the minimum Defendable Space widths required between the future buildings and the bushfire prone vegetation in the E2 zone have been established so as to minimise flame contact with the adjacent buildings and therefore reduce the likely radiant heat exposure on the buildings to less than 40kW/m².

Should the minimum Defendable Space widths prevail, the construction of that portion of the building exposed to the hazard shall be constructed to the standards of BAL 40 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 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 Horsley Park Employment Precinct will be provided in the long term with the construction of the WSEA Link Road Network which enters the north-eastern corner of the site and exits the western boundary, extending across the adjoining land to connect Bakers Lane.

A temporary access road is proposed for the Stage 1 Project Application, extending from Old Wallgrove Road, along the northern boundary of the adjoining CSR Brickworks site, thence turning south along the western aspect of the proposed Building No. 1 to provide heavy vehicle access to the southern portion of the site occupied by the new building.

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, providing 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 E2 corridor shall be available from the proposed local road.

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. The building 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.

Due to the low bushfire risk to the facilities within the Horsley Park Employment Precinct there is no requirement for the preparation of a specific Bushfire Evacuation Plan or a Bushfire Management Plan for the future buildings.

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 Horsley Park Employment Precinct are as follows:

6.1 Strategy 1 – Defendable Space Requirements – Concept Plan

Table 3. 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>E2 zoned corridor</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 minimum 10 metres wide provided by setback to the buildings

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

Table 4. Determination of Defendable Space to the future building – Project Application for Building No. 1

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>All aspects</i>	Grassland	Nil classification	Varies	Not Applicable	Nil defendable space required

Note: There is no requirement to provide a Defendable Space to Building No. 1 in the Project Application.

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 the E2 zoned corridor:

Should the minimum Defendable Space widths prevail between the vegetation in the E2 zoned corridor and the adjacent buildings, that portion of the building exposed to the hazard shall be constructed to the standards of BAL 40 as defined by A.S. 3959 – 2009.

The following construction standards are recommended to minimise ember attack on the buildings located adjacent to the bushfire hazard in the E2 corridor:

- 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 – Access Standards for Firefighting Operations.

Access to the bushfire prone vegetation within the E2 zoned corridor 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.

SECTION 7

CONCLUSION

A Concept Plan and Concurrent Project 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 Horsley Park Employment Precinct on Lot A in Deposited Plan 392643, Burley Road Horsley Park which is a 100 hectare site within the Western Sydney Employment Area.

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 Penrith Bushfire Prone Land Map does not record the site as containing bushfire prone vegetation. However, the E2 zoned corridor to the located within the southern portion of the development site will naturally revegetate and is likely to become a bushfire hazard to the adjoining development.

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

In this respect this report has therefore reviewed the proposed development against the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006* and found that the Concept Plan provides complying defendable spaces between the buildings and the future bushfire prone vegetation in the E2 zoned corridor.

The defendable space setback width exceeds the 'flame zone' width required to address the NSW Rural Fire Service's requirements for Class 5 – 10 buildings [as defined by the Building Code of Australia].

This report also examines the defendable space requirements to Building No. 1 in the Stage 1 Project Application and has found that no defendable spaces are required to this building as it is adjoined by grassland vegetation which is not deemed to be bushfire prone vegetation.

Table 5 summarises the extent to which the Concept Plan conforms to the deemed-to-satisfy specifications of *Planning for Bushfire Protection 2006*.

Table 5. 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 that adjoin the E2 zoned land 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 path/cycle-way network may be required to provide access to the vegetation within the E2 zoned corridor
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 due to the low bushfire risk.
Building construction standards	YES – Construction standards recommended in order to address radiant heat levels on the buildings adjoining the E2 corridor 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 due to low bushfire risk.



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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*”;
- *Penrith City Council Bushfire Prone Land Map*.

ATTACHMENT A – Concept Masterplan showing Defendable Space widths to the E2 zoned land within the Horsley Park Employment Precinct.

