

A decorative background element on the left side of the page, consisting of several concentric, irregular contour lines in a light green color, resembling a topographic map. The lines are more densely packed in some areas and more spread out in others, creating a sense of depth and terrain.

Burrah Park DHL Masterplan Stage 1 & 2

Bushfire Protection Assessment

DHL Supply Chain (Australia) Pty Ltd

Document Tracking

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Project Number: 22SYD3598

Project Manager: Courtney Blick

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Executive Summary

This report is a Bushfire Protection Assessment prepared by Eco Logical Australia Pty Ltd (ELA) for DHL Supply Chain (Australia) Pty Ltd (DHL), for the following State Significant Development Applications (SSDA) submitted to the NSW Department of Planning, Housing and Industry (DPHI):

- SSD-7081878 (Stage 1, southern half of DHL masterplan site)
- SSD-70817958 (Stage 2, northern half of DHL masterplan site)

The site is located within the Northern Gateway Precinct of the Western Sydney Aerotropolis at 1953-2109 Elizabeth Drive, Badgerys Creek NSW, within part of Lot 1 DP1306448.

The development is to be assessed as two separate State Significant Development (SSD) proposals. DHL is seeking consent for the construction and operation of warehouse and logistics facilities, including two warehouses and associated landscaping works on each Stage of the DHL masterplan site. The project has been assessed against industry specific Secretary's Environmental Assessment Requirements (SEARs) for warehouses and distribution centres. The SEARs (warehouses and distribution centres) require an assessment of bushfire.

The proposal was assessed in accordance with Planning for Bush Fire Protection (RFS 2019), herein referred to as PBP. The proposal is for a commercial development and therefore, has been assessed in accordance with the aim and objectives of PBP. Chapter 7 of PBP has been utilised as a guide in developing relevant bushfire protection measures (BMP) commensurate with the bushfire risk to the site.

The proposed development meets the specific objectives of PBP subject to the implementation of recommendations in relation to Asset Protection Zones (APZs), access, water supply, electricity service, gas service, construction standards and Landscaping.

It is recommended that the proposed development be approved with consent conditions based on the findings in Table 13 above.

If the vegetation to the northwest of subject land is still in situ prior to commencement of construction an 88b instruments under Section 88b of the *Conveyancing Act 1919* should be used to manage the APZ on adjoining land. It is recommended that this is included as condition of consent prior to issue of the construction certificate. Once this land is developed and the hazard is removed the instrument should be extinguished.

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Abbreviations

Abbreviation	Description
AS 3959	Australian Standard AS 3959-2018 <i>Construction of buildings in bushfire prone areas</i>
APZ	Asset protection zone
BAL	Bushfire attack level
BFPL	Bush fire prone land
BPM	Bushfire protection measures
DCP	Development control plan
FDI	Fire danger index
IPA	Inner protection area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
PBP	Planning for Bushfire Protection 2019
RFS	NSW Rural Fire Service

1. Introduction

This report is a Bushfire Protection Assessment prepared by Eco Logical Australia Pty Ltd (ELA) for DHL Supply Chain (Australia) Pty Ltd (DHL), for the following State Significant Development Applications (SSDA) submitted to the NSW Department of Planning, Housing and Industry (DPHI):

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The development is to be assessed as two separate State Significant Development (SSD) proposals. DHL is seeking consent for the construction and operation of warehouse and logistics facilities, including two warehouses and associated landscaping works on each Stage of the DHL masterplan site. The project has been assessed against industry specific Secretary's Environmental Assessment Requirements (SEARs) for warehouses and distribution centres. The SEARs (warehouses and distribution centres) require an assessment of bushfire. These requirements are addressed in Table 1 below.

The proposal was assessed in accordance with *Planning for Bush Fire Protection* (RFS 2019), herein referred to as PBP. The proposal is for a commercial development and therefore, has been assessed in accordance with the aim and objectives of PBP. Chapter 7 of PBP has been utilised as a guide in developing relevant bushfire protection measures (BMP) commensurate with the bushfire risk to the site.

The proposed development meets the specific objectives of PBP subject to the implementation of recommendations in relation to Asset Protection Zones (APZs), access, water supply, electricity service, gas service, construction standards and Landscaping.

1.1. The Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements (SEARs) have been issued in respect of the proposal. The SEARs require a bushfire assessment of the development. Table 1 below indicates the areas of the report that address each of these components.

Table 1: How the Report Addresses the SEARs

Key Issue of SEARs	Addressed by Section of the Report
22. Bush Fire Risk If the development is on bush fire prone land, provide a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with <i>Planning for Bush Fire Protection</i> .	Section 2.2 presents requirements of Planning for Bush Fire Protection Section 3 present the bushfire hazard assessment Section 4 presents bushfire protection measures

1.2. Western Sydney Aerotropolis Development Control Plan 2020

This report demonstrates compliance with the Western Sydney Aerotropolis Development Control Plan (DCP; DPIE 2020), Table 2 below indicates where these requirements have been met.

Table 2: Compliance with Western Sydney Aerotropolis DCP

Reference	Performance Outcomes	Report Section	Proposal Compliance
Section 4.3 Bushfire Hazard Management			

Reference	Performance Outcomes	Report Section	Proposal Compliance
PO1	Development is provided with a safely located, freely accessible and adequate water supply for firefighting purposes.	Section 4.5	Complies Compliance has been assessed and determined based on achieving the acceptable solutions of Table 7.4a of PBP. This includes adequate water supplies are provided, located at regular intervals, is accessible and reliable for firefighting operations, has appropriate flows and pressure and the integrity of the supply is to be maintained.
PO2	Development uses adequate buffers and Asset Protection Zones and avoids areas of medium and high bushfire risk.	Section 4.3	Complies Compliance based on the requirements of Table 7.4a of PBP. The proposal achieves residential APZ which allows for a maximum exposure of BAL-29.
PO3	Siting of buildings, lot design and design of development provides for the safety of people and property by mitigating the bushfire risk.	Section 4.1	Complies The proposal meets the specific aims and objectives for industrial and commercial development. The siting of the building is exposed to a maximum BAL-29, providing for the protection of human life and minimising impacts on property from the threat of bushfire.
PO4	The manufacture or storage of hazardous materials in bulk must consider the impacts of bushfire on public safety and the environment	Section 4.2	Complies Hazardous materials (if any) are to be stored in accordance with the relevant safety guidelines and safety data sheets.
PO5	For development that will result in multiple buildings or lots, roads and access are designed to mitigate against bushfire hazard by ensuring adequate access for: a) firefighting and other emergency vehicles; and b) the evacuation of people in the event of an emergency.	Section 4.4	Complies Access requirements as per Table 7.4a of PBP can be achieved to provide adequate access for firefighting and emergency vehicles.
PO6	For development that will result in multiple buildings or lots, fire breaks are provided that: a) adequately and effectively separate the development site from surrounding vegetation to mitigate against bushfire hazard; b) have sufficient width to enable continuous access for firefighting and other emergency vehicles, residents and equipment; and c) are in secure tenure and are maintained.	N/A	Complies APZ requirements as per Table 7.4a of PBP can be achieved to provide defensible space and prevent spread of a fire to the building.
PO7	Development is to be in accordance with Rural Fires Act 1997, Planning for Bushfire Protection 2006 and Planning	Section 2.2	Complies The proposal has been assessed in accordance with <i>Planning for Bushfire Protection 2019</i> , which

Reference	Performance Outcomes	Report Section	Proposal Compliance
	for Bush Fire Protection Pre-Release 2018.		supersedes the noted 2006 and 2018 versions.
PO8	Ensure more than one evacuation route is provided for any lots affected by bushfire risk. The two (or more) access paths should not converge at any point and would ideally head in opposite directions so as to minimise the likelihood that both are severed during a fire.	Section 4.4	Complies The proposal is accessed by two-way, paved driveways using two access paths (north and south) to the development.

2. Project Background

Table 3 below identifies the subject property and outlines the type of development proposed.

Table 3: Subject site and development proposal summary

Street address:	Elizabeth Drive, Badgerys Creek
Postcode:	2555
Lot/DP no:	Lot 1 DP 1306448
Local Government Area:	Penrith City Council
Fire Danger Index (FDI)	100
Current land zoning:	ENT - Enterprise
Type of development proposed:	Industrial Building

For the purposes of this report, the Stage 1 & 2 have been assessed in tandem. The division of Stage 1 and 2 within the subject land is presented in Figure 1 below.

The proposed development is for Class 7b buildings, shown in Figure 2 with approximate sizes below. Warehouses 3 and 4 are part of Stage 1. Warehouses 1 and 2 forms part of Stage 2. Both SSDAs form part of the DHL Masterplan at Burrah Park, therefore have been assessed in conjunction.

- Warehouse 1 - 31,954 m²
- Warehouse 2 - 31,954 m²
- Warehouse 3 - 25,026 m²
- Warehouse 4 - 29,205 m²

The subject land is identified as Bush Fire Prone Land (BFPL) on the Bushfire Prone Land layer within the ePlanning Spatial Viewer (accessed from planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address).

2.1. Project description

The DHL Masterplan site occupies approximately 25 hectares (ha) of the larger 171.84 ha site at 1953-2109 Elizabeth Drive, Badgerys Creek. The wider site is currently the subject of an existing SSDA for 'Burrah Park' (SSD-70316465). The DHL Masterplan site consists of two SSDA proposals, being Stage 1 (southern portion of the site) and Stage 2 (northern portion) as shown in Figure 1. These are described below.

The proposal aims to develop a world class warehouse and logistics facility which is fully integrated with its green infrastructure and Connection to Country. Informed by key landscape and Connecting to Country themes, the development can deliver on objectives that contribute to the Aerotropolis Vision:

Achieve a landscape led approach and starting with Country- the project has been guided by Cultural Design Principals and local leaders in the Aboriginal community.

Create a new global gateway which will be a regionally and nationally significant employment area by providing for warehouse and logistics land uses in a highly sought-after location adjacent to the new Western Sydney Airport.

Design a cool, green new city with a landscape approach that increases urban tree canopy, provides useable open space areas throughout and restores key riparian corridors on the site.

Transitioning to an Aerotropolis through a sustainable, orderly and transformational development in the Western Sydney Aerotropolis,

Retaining a green, biodiverse landscape informed by Country and an indigenous lens on maintenance and land management.

Stage 1 – SSD-70818708

Specifically, the Stage 1 SSDA seeks consent for staged construction of warehouse buildings for use as a logistics centre with 24 hour / day, seven days a week operation, comprising the following:

- Construction of two warehouses;
- Building fit out;
- Construction of hardstand, loading and carparking;
- Landscaping works; and
- Signage.

Stage 2 – SSD-70817958

Specifically, the Stage 2 SSDA seeks consent for staged construction of warehouse buildings for use as a logistics centre with 24 hour / day, seven days a week operation, comprising the following:

- Construction of two warehouses;
- Building fit out;
- Construction of hardstand, loading and carparking;
- Landscaping works; and
- Signage.



Figure 1: DHL Masterplan Site

2.2. Assessment process

The proposal was assessed in accordance with *Planning for Bush Fire Protection* (RFS 2019), herein referred to as PBP.

The proposal is for an industrial development and therefore, has been assessed in accordance with the aim and objectives of PBP. Chapter 7 of PBP has been utilised as a guide in developing relevant bushfire protection measures (BMP) commensurate with the bushfire risk to the site.

This assessment is based on the following information sources:

- Background documentation provided by Urbis and DHL;
- Information contained within the site plan prepared by SBA Architects Issue 2, Project No.21254 Rev. 2, dated 17 August 2022; and
- GIS analysis including online spatial resources (Nearmap; NSW Government Planning Portal).

Table 4 below identifies the BPM assessed in this report.

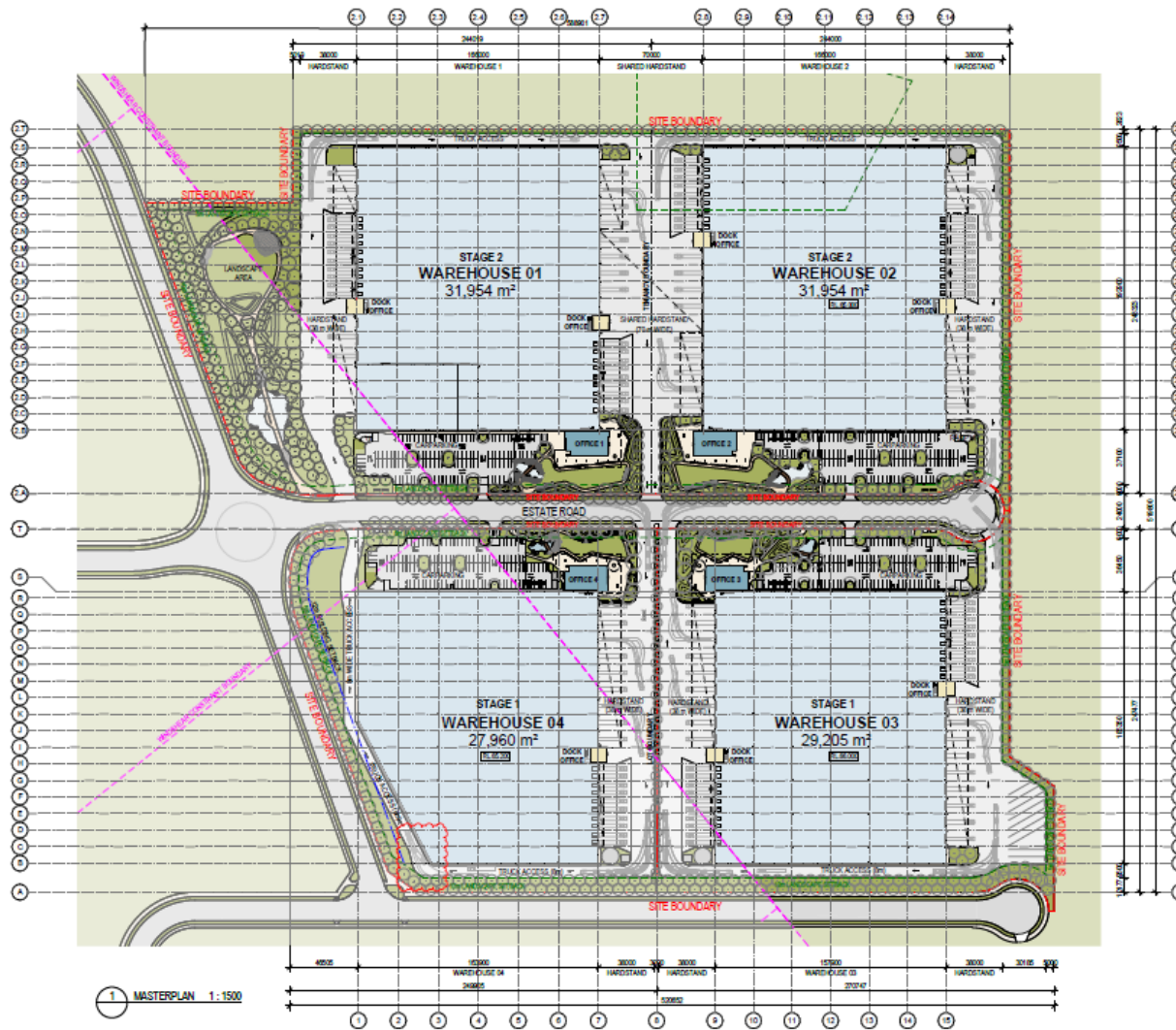
Table 4: Summary of bushfire protection measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.3
Access	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.4
Water supplies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.5
Electricity services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.6
Gas services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.7
Construction standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.8
Landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.9

2.3. Significant environmental features

An assessment of significant environmental features, threatened species, populations or ecological communities under the *Biodiversity Conservation Act 2016* that may potentially be affected by the proposed bushfire protection measures has not been undertaken in this report as it is covered by other parts of the Development Application (DA) process.

The impact footprint of the BPM (e.g. Asset Protection Zone (APZ) is clearly identified within this report and therefore capable of being assessed by suitably qualified persons as required. Penrith City Council is the determining authority for this development; they will assess more thoroughly any potential environmental issues.



AREA SCHEDULE - MASTERPLAN	
SITE AREA:	26.18 Ha
ESTATE ROAD AREA:	1.21 Ha
TOTAL DEVELOPABLE AREA:	24.97 Ha
WAREHOUSE 1:	31,954 sqm
WAREHOUSE 2:	31,954 sqm
WAREHOUSE 3:	29,205 sqm
WAREHOUSE 4:	27,960 sqm
OFFICES x 4:	3,864 sqm (2 Levels)
DOCK OFFICES x 7:	1,603 sqm (2 Levels)
TOTAL BUILDING AREA:	126,540 sqm
FLOOR SPACE RATIO:	0.51:1
REQ. LANDSCAPE AREA:	15% / 39,27 m²
PARKING RATES (as per WSA DCP 2021):	
-WAREHOUSE:	min. 1 Space / 250m²
-OFFICE:	min. 1 Space / 250m²
PARKING REQUIRED:	
WH01 + OFFICE 01:	132
WH02 + OFFICE 02:	132
WH03 + OFFICE 03:	121
WH04 + OFFICE 04:	119
TOTAL CARPARKING REQUIRED:	504
TOTAL CARPARKING PROVIDED:	
-STAGE 1:	441
-STAGE 2:	440
-TOTAL:	881

MASTERPLAN GENERAL LEGEND	
	SITE BOUNDARY
	LOT BOUNDARY
	LANDSCAPE SETBACK
	OBJECT ABOVE
	WINDSHEAR CONSTRAINT BOUNDARY
	LANDSCAPE
	HARDSTAND
	WAREHOUSE
	OFFICE
	DOCK OFFICE
	RSD - ROLLER SHUTTER DOOR
	FNC-1 - PALISADE FENCE
	ROW - RETAINING WALL
	TYP - (TYPICAL)
	SLG1 - SLIDING GATE
	DGS - DANGEROUS GOODS STORE
	SB - SIGANAGE: REFER TO SIGNAGE PLAN

SSDA ISSUE

NO.	DESCRIPTION	DATE	BY
1	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
2	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
3	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
4	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
5	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
6	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
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9	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
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48	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
49	ISSUE FOR CONSTRUCTION	08/08/24	SSDA
50	ISSUE FOR CONSTRUCTION	08/08/24	SSDA

PROPOSED INDUSTRIAL DEVELOPMENT

LOT 1/DP1306448, BADGERYS CREEK (NORTH)

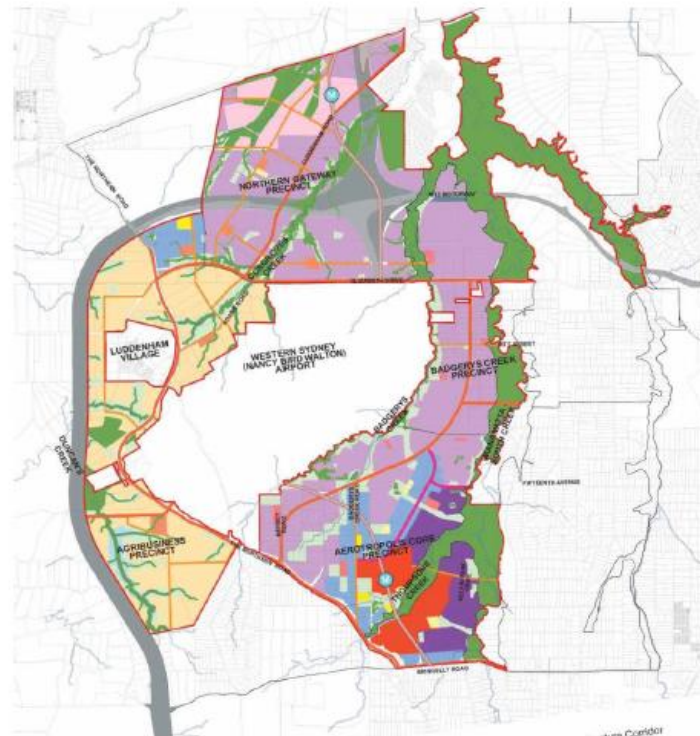


MASTERPLAN STAGING & DEVELOPMENT SUMMARY					
DATE	SCALE	PROJECT NO.	REVISED NO.	REVISED DATE	REVISED BY
10/10/2024	1:1500 @ A1	21254	DA100	7	
	1:3000 @ A3				

Figure 2: Proposed development site plan



BADGERYS CREEK PRECINCT: LAND USE AND STRUCTURE PLAN



- | | | |
|--|--|-------------------------------|
| ■ Commercial centre - mixed use | ■ Specialised centre mixed use | Major Infrastructure Corridor |
| ■ Local/Neighbourhood Centre | ■ Open Space / Stormwater Land | M12 motorway |
| ■ Business and enterprise | ■ Environment and Recreation | Outer Sydney Orbital |
| ■ Mixed use residential | ■ Primary arterial road | East West Rail Link |
| ■ Agribusiness | ■ Primary arterial road (rapid bus) | Metro Station |
| ■ Enterprise and light industry | ■ Sub-arterial | Land Application Boundary |
| ■ Education | | Watercourses |
| ■ Special Infrastructure | | Property Boundary |
| | | Precinct Boundary |

THE NORTHERN GATEWAY SITE - REGIONAL CONTEXT



DHL SITE LOCATION



PRELIMINARY

		<p>PROPOSED INDUSTRIAL DEVELOPMENT</p> <p>LOT 101/DP848215, BADGERYS CREEK</p>	<p>STRUCTURE PLAN & REGIONAL CONTEXT</p> <p>DATE: 01/06/2022 NOT TO SCALE PROJECT NO: 21254 DRAWING NO: 1</p>
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Figure 3: Northern Gateway proposal

3. Bushfire hazard assessment

3.1. Process

The site assessment methodology set out in Appendix 1 of PBP has been utilised in this assessment to determine the APZ requirements. Figure 4 and Table 5 show the effective slope and predominant vegetation representing the highest bushfire threat potentially posed to the development from various directions.

3.2. Vegetation assessment

In accordance with PBP, the predominant vegetation formation has been assessed for a distance of at least 140 m from the subject land in all directions.

The predominant vegetation has been determined from State Vegetation Type Map (SVTM) (DPE 2023), previous reporting for the site (ELA 2024) and previous site assessment works in the region.

3.3. Slope assessment

In accordance with PBP, the slope that would most significantly influence fire behaviour was determined over a distance of 100 m from the boundary of the proposed development under the classified vegetation.

The effective slope has been determined from 2 m contour data.

3.4. Summary of assessment

As shown in Table 3, the predominant bushfire threat potentially posed to the development is unmanaged grassland in all directions. This hazard is considered temporary in nature and will be removed as the broader precinct is activated and further development occurs. A narrow windbreak to the northwest of the subject land has been assessed as low hazard, however it is expected that development of adjoining lots occurs this hazard will be removed. The grassland hazard will also be minimised, and/or removed, as development of adjoining lots occurs.

It is noted that the proposed development has been assessed in conjunction with Stage 1 (SSD 70818708) as shown in Figure 4. Stage 2 (SSD 70817958) only seeks development of Warehouse 1 and Warehouse 2 in the north of the precinct.

Table 5: Bushfire hazard assessment, APZ requirements and BALs

Transect #	Slope	Vegetation Formation	Recommended APZ	Available APZ	Bushfire Attack Level (BAL)	Comments
Warehouse 1						
1 (North)	>0° to 5° downslope	Low Hazard (Rainforest)	14 m	≥14 m	BAL-29	APZ provided within lot (12.5 m) and partially (1.5 m) within adjoining property under agreement with landowner*
2 (North)	>0° to 5° downslope	Grassland	12 m	≥12 m	BAL-29	APZ provided wholly within subject land boundary, additional setback provided within lot and proposed road
All other directions Managed Land						
Warehouse 2						
2 (North)	>0° to 5° downslope	Grassland	12 m	≥12 m	BAL-29	APZ provided wholly within subject land boundary, additional setback provided within lot and proposed road
3 (East)	>0° to 5° downslope	Grassland	12 m	≥25 m	BAL-12.5	APZ provided wholly within subject land boundary, additional setback provided within lot and proposed road
All other directions Managed Land						
Warehouse 3						
3 (East)	>0° to 5° downslope	Grassland	12 m	>25 m	BAL-12.5	APZ provided wholly within subject land boundary, additional setback provided within lot and proposed road
4 (South)	>0° to 5° downslope	Grassland	12 m	>25 m	BAL-12.5	APZ provided wholly within subject land boundary, additional setback provided within lot
4 (South)	>0° to 5° downslope	Grassland	12 m	≥25 m	BAL-12.5	APZ provided wholly within subject land boundary, additional setback provided within lot

Transect #	Slope	Vegetation Formation	Recommended APZ	Available APZ	Bushfire Attack Level (BAL)	Comments
All other directions Managed Land						
Warehouse 4						
4 (South)	>0° to 5° downslope	Grassland	12 m	>25 m	BAL-12.5	APZ provided wholly within subject land boundary, additional setback provided within lot
5 (West)	>0° to 5° downslope	Grassland	12 m	>50 m	BAL-Low	APZ provided wholly within subject land boundary, additional setback provided within lot and proposed road
All other directions Managed Land						

*IF THE VEGETATION TO THE NORTHWEST OF SUBJECT LAND IS STILL IN SITU PRIOR TO COMMENCEMENT OF CONSTRUCTION AN 88B INSTRUMENTS UNDER SECTION 88B OF THE *CONVEYANCING ACT 1919* SHOULD BE USED TO MANAGE THE APZ ON ADJOINING LAND. IT IS RECOMMENDED THAT THIS IS INCLUDED AS CONDITION OF CONSENT PRIOR TO ISSUE OF THE CONSTRUCTION CERTIFICATE. ONCE THIS LAND IS DEVELOPED AND THE HAZARD IS REMOVED THE INSTRUMENT SHOULD BE EXTINGUISHED.

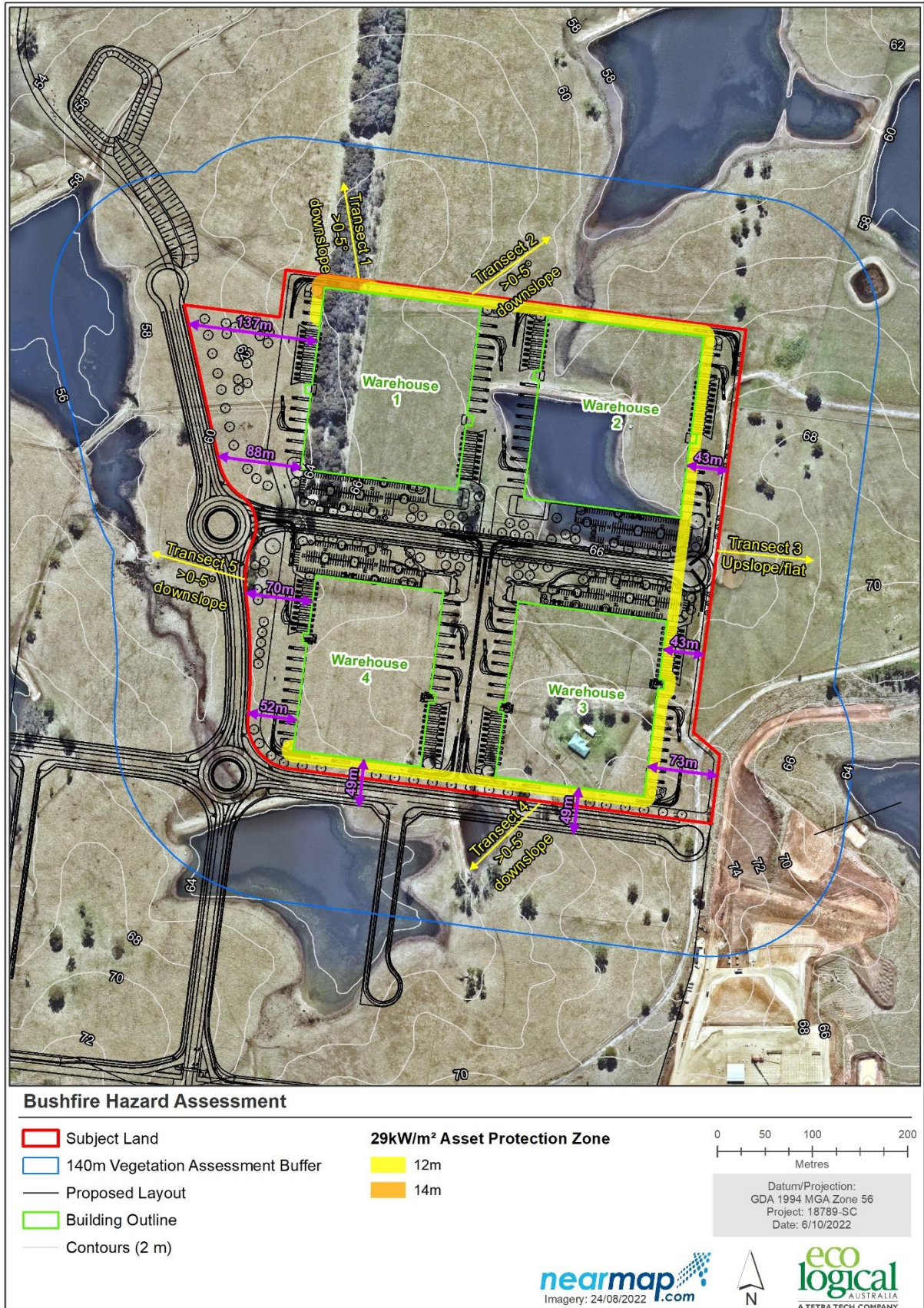


Figure 4: Bushfire Hazard Assessment

4. Bushfire protection measures

4.1. Specific aim and objectives for industrial/commercial development

Below is the Aim of PBP and the Specific Objectives for industrial/commercial development and a comment on how they are achieved. As directed in Section 8.3.10 of PBP, the BPM identified in Chapter 7 (of PBP) have been used as the baseline (where applicable), and either the acceptable solution or performance criteria has been achieved:

Aim - The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

- The proposed development complies with the aim of PBP by achieving the specific objectives for industrial / commercial development identified below.

Specific Objective 1 - *afford buildings and their occupants protection from exposure to a bush fire;*

- The development provides protection from exposure by way of defensible space by adequate APZ and perimeter access as shown in Figure 3 and Figure 4.
- The estate road and internal truck access roads link to the public road network to the north and south, and complies with Section 7 of PBP providing safe evacuation routes for future occupants. Construction standards will also support this objective.

Specific Objective 2 - *provide for a defensible space to be located around buildings;*

- The site provides a defensible space by way of perimeter access/road and APZ as shown in Figure 4.

Specific Objective 3 - *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*

- The development design provides opportunity to achieve suitable defensible space between hazard and building. Perimeter access to the public estate road is provided to the south of warehouse 1 and 2, and to the north of warehouse 3 and 4. All buildings have full perimeter truck access on all boundaries to allow emergency service personal an adequate operational area for prevention of fire spread.

Specific Objective 4 - *ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*

- The Northern Gateway precinct development will enable access to the development via a public through roads to the west, affording safe operational access/egress to emergency services as shown in Figure 4 and demonstrated further in Section 4.4.

Specific Objective 5 - *provide for ongoing management and maintenance of BPM; and*

- The entire development site is to be managed as an Inner Protection Area (IPA) as per the specifications outlined in **Appendix A:**. Landscaping will need to comply with the acceptable solutions identified in Table 7.4a of PBP.

Specific Objective 6 - *ensure that utility services are adequate to meet the needs of firefighters.*

- The development is capable of complying with the acceptable solutions for utilities under Section 7 of PBP and specific objectives outlined in Section 4.4 – 4.7 of this report.

4.2. Specific objectives for Class 5-8 buildings

Below are the Specific Objectives for Class 5 - 8 buildings and a comment on how they are achieved.

Specific Objective 1 - provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.

- As shown in Figure 4 and demonstrated further in Section 4.4 of this report, the proposed development has direct access to the proposed public road system of the Northern Gateway precinct to the west, providing safe access/egress for both firefighters and occupants.

Specific Objective 2 - provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.

- An emergency plan meeting requirements of the Work Health safety Regulation 2017 and relevant legislation is to be prepared for the building prior to Occupation Certificate.

Specific Objective 3 - provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

- The proposed development will be serviced by reticulated water. Electricity to the development is underground and complies with PBP. Supply of gas (if any) will be installed and maintained in accordance with Section 7.4 of this report.

Specific Objective 4 - provide for the storage of hazardous materials away from the hazard wherever possible.

- The building will be required to store any hazardous materials (if any) in accordance with the relevant safety guidelines and safety data sheets.

4.3. Asset Protection Zones

Table 5 shows the dimensions of the required APZ and where relevant, information on how the APZ is to be provided is included. The footprint of the APZ is also shown on Figure 4 The compliance of the proposed APZ with regards to Section 7.4 of PBP, is detailed in Table 6.

Table 6: APZ requirements and compliance (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
APZs are provided commensurate with the construction of the building; and A defensible space is provided.	An APZ is provided in accordance with Table A1.12.2 in Appendix 1.	Complies APZ provided in accordance with Table A1.12.2 as shown in Table 5 and Figure 4.
APZs are managed and maintained to prevent the spread of a fire to the building	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	To comply APZ to be managed in accordance with PBP. Fuel management specifications provided in Appendix A:.
The APZ is provided in perpetuity. APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are wholly within the boundaries of the development site.	Complies APZ located wholly within the warehousing development site.
	APZ are located on lands with a slope less than 18 degrees.	Complies

Performance Criteria	Acceptable Solutions	Compliance Notes
		APZ is not located on slopes greater than 18°.

4.4. Access

No additional public roads are proposed as access to the proposed commercial development is via driveways off proposed roads within the subdivision. Access is by a two-way through road driveways to the north and south.

The compliance of the proposed property access with Section 7.4 of PBP is detailed in Table 7.

Table 7: Property access requirements (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance notes
The intent may be achieved where:		
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Complies Property will be accessed by a two-way, paved driveway with two access points.
The capacity of access roads is adequate for firefighting vehicles	The capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	Can comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 7.4a of PBP.
There is appropriate access to water supply.	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 [SA 2005a]; There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.	Can comply Not applicable
Firefighting vehicles can access the dwelling and exit the property safely.	Minimum 4 m carriageway width;	Complies >4 m carriageway width provided.
	In forest, woodland and heath situations, rural property access roads have passing bays every 200 m that are 20 m long by 2 m wide, making a minimum trafficable width of 6 m at the passing bay;	Not applicable
	A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches;	Can comply Landscaping to comply with specifications of PBP.
	Provide a suitable turning area in accordance with Appendix 3 of PBP;	Can comply PBP compliant turning areas addressed in Appendix 3.
	Curves have a minimum inner radius of 6 m and are minimal in number to allow for rapid access and egress;	Can comply

Performance Criteria	Acceptable Solutions	Compliance notes
	The minimum distance between inner and outer curves is 6 m;	The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 7.4a of PBP.
	The crossfall is not more than 10 degrees;	
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads;	

4.5. Water supplies

The compliance of the proposed water supply with Section 7.4 of PBP is detailed in Table 8.

Table 8: Water supply requirements (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available; A static water supply is provided where no reticulated water is available.	Can comply The development will be serviced by a reticulated water supply.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1 (SA 2005); Hydrants are not located within any road carriageway; and Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Can comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 7.4a of PBP.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1 (SA 2005).	
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps; and Above-ground water storage tanks shall be of concrete or metal.	

4.6. Electricity services

The compliance of proposed supply of electricity services with Section 7.4 of PBP is detailed in Table 9.

Table 9: Requirements for the supply of Electricity services (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground; Where overhead, electrical transmission lines are proposed as follows: Lines are installed with short pole spacing (30 m), unless crossing gullies, gorges or riparian areas; and No part of a tree is closer to a power line than the distance set out in ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets (ISSC3 2016).	Can comply Electricity services to the development will be located underground. Not applicable.

4.7. Gas services

The compliance of proposed supply of gas services (reticulated / bottle gas) with Section 7.4 of PBP is detailed in Table 10.

Table 10: Requirements for the supply of gas services (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 – The Storage and handling of LP gas (2014), the requirements of relevant authorities, and metal piping is used; All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 m and shielded on the hazard side; Connections to and from gas cylinders are metal; Polymer-sheathed flexible gas supply lines are not used; and Above-ground gas service pipes are metal, including and up to any outlets.	Can comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 5.3c of PBP.

4.8. Construction standards

The building construction standard is generally based on the determination of the BAL in accordance with Appendix 1 of PBP. BAL-12.5 is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard. The compliance of the proposed construction with Section 7.4 of PBP is detailed in Table 11.

Table 11: Construction requirements (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
The proposed building can withstand bush fire attack in	BAL is determined in accordance with Tables A1.12.5 to A1.12.6 of PBP; and	Complies BAL determined using Table A1.12.5 of PBP.

Performance Criteria	Acceptable Solutions	Compliance Notes
the form of embers, radiant heat and flame contact.	Construction provided in accordance with the NCC and as modified by Section 7.5 of PBP.	Complies with performance criteria No specific requirements for bushfire related construction under the NCC for this building class. See Section 4.8.2 for further detail.
Proposed fences and gates are designed to minimise the spread of bush fire.	Fencing and gates are constructed in accordance with Section 7.6 of PBP.	Can comply Specification detailed in Section 4.8.4 of this report.
Proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with Section 8.3.2 of PBP.	Not applicable No Class 10a buildings proposed.

4.8.1. Bushfire Attack Level (BAL)

The proposed development is exposed to a maximum of **BAL-29** as identified in Table 5.

4.8.2. Construction requirements

As stated within Section 8.3.1 of PBP, National Construction Code (NCC) Class 5 to 8 buildings (which include offices, factories, warehouses and other commercial or industrial facilities) do not have specific bushfire performance requirements under the NCC and as such building construction standards under AS 3959:2018 (SA 2018) or the NASH standard (NASH 2014) do not apply as a set of deemed to satisfy provisions.

New construction shall be in accordance with the general fire safety provisions of the NCC and incorporate the additional ember protection measures listed in Section 4.8.3 below.

4.8.3. Ember protection measures

The additional ember protection measures based on the requirements of AS 3959 are as follows:

- The roof/wall junctions are to be sealed/screened with aluminium, steel or bronze mesh with a minimum aperture size of 2 mm;
- All openable portions of windows to be screened with aluminium, steel or bronze mesh with a minimum aperture size of 2 mm;
- The base of side-hung external doors shall be fitted with draught excluders/draught seals/weather strips;
- Gutters should be fitted with non-combustible gutter guard to prevent the build-up of combustible material;
- The rollers doors shall be protected with suitable weather strips/draught excluders/draught seals or brushes (Figure 5). If fitted with guide tracks no edge gap protection required; and
- Roller shutter doors with ventilation slots shall be protected with non-combustible mesh with 2 mm aperture.

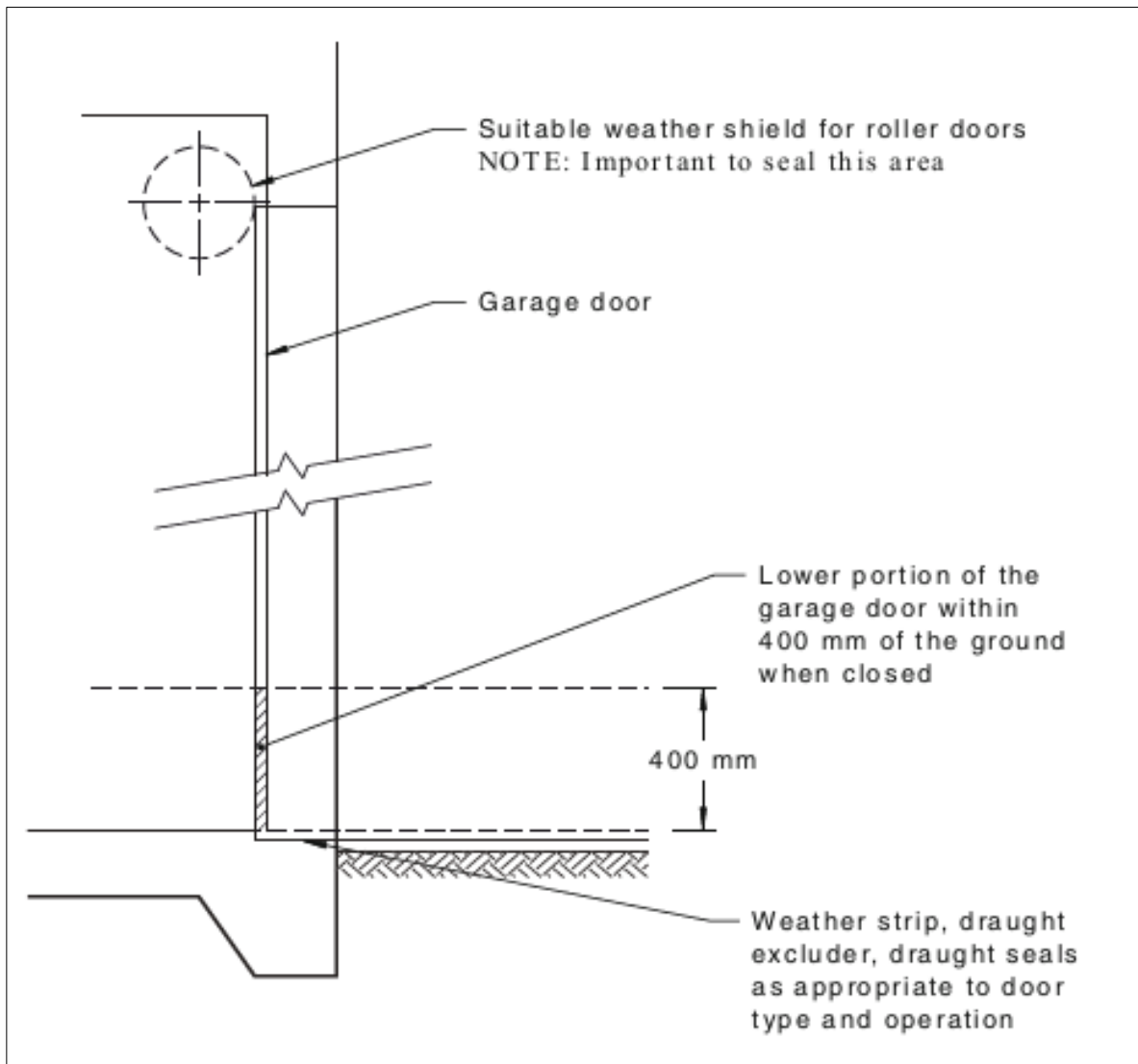


Figure 5: Roller shutter door installation (SA 2018)

4.8.4. Fences and gates

To comply with Section 7.6 of PBP, all fencing and gates are to be constructed of hardwood or non-combustible material. Where fencing connects directly to any proposed building or in areas of BAL-29 or greater, they should be made of non-combustible material.

4.9. Landscaping

The compliance of the proposed landscaping with Section 7.4 of PBP is detailed in Table 12.

Table 12: Landscaping requirements and compliance (adopted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the	Compliance with the NSW RFS 'Asset protection zone standards' (Appendix 4 PBP);	To comply APZ / Landscaping is to be managed in accordance with PBP, as detailed in Section 4.9.

Performance Criteria	Acceptable Solutions	Compliance Notes
<p>potential for wind-driven embers to cause ignitions.</p>	<ul style="list-style-type: none"> ● A clear area of low-cut lawn or pavement is maintained adjacent to the house; 	
	<ul style="list-style-type: none"> ● Fencing is constructed in accordance with Section 7.6 of PBP. 	<p>To comply Fencing to be constructed in accordance with Section 7.6 of PBP (see Section 4.8.4)</p>
	<p>Trees and shrubs are located so that:</p> <ul style="list-style-type: none"> ● the branches will not overhang the roof; ● the tree canopy is not continuous; and ● any proposed wind break is located on the elevation from which fires are likely to approach. 	<p>To comply APZ / Landscaping is to be managed in accordance with PBP. Landscaping specifications provided in Section 4.9.</p>

5. Conclusion

The proposed development meets the specific objectives of 'Planning for Bush Fire Protection 2019', as outlined in Table 13 below.

Table 13: Development Bushfire Protection Solutions and Recommendations

Bushfire Protection Measures	Recommendations	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	This assessment indicates the proposed development will comply with the PBP APZ performance criteria (Figure 4) In addition, if the narrow windbreak (to the northwest of the subject land) is in situ prior to construction an 88b instrument should be created to manage the APZ on adjoining land.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.3
Access	Access to meet specific objectives as per Section 4.4 of this report.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.4
Water supply	Reticulated water supply to meet PBP acceptable solution specifications.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.5
Electricity service	Electricity supply located underground.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.6
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.7
Construction standard	The development is to be constructed in accordance with the general fire safety provisions of the NCC and incorporate the additional ember protection measures listed in Section 4.8.2 below.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.8
Landscaping	Any future landscaping meets the requirements of PBP listed in Section 4.9.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4.9

6. Recommendations

It is recommended that the proposed development be approved with consent conditions based on the findings in Table 13.

If the vegetation to the northwest of subject land is still in situ prior to commencement of construction an 88b instruments under Section 88b of the *Conveyancing Act 1919* should be used to manage the APZ on adjoining land. It is recommended that this is included as condition of consent prior to issue of the construction certificate. Once this land is developed and the hazard is removed the instrument should be extinguished.



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Senior Consultant



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Senior Bushfire Consultant

FPAA BPAD Accredited Practitioner No. BPAD29962-L3



7. References

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- Keith, D. 2004. *Ocean Shores to Desert Dunes*. Department of Environment and Conservation, Sydney.
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- Standards Australia (SA). 2014. *The storage and handling of LP Gas*, AS/NZS 1596:2014. SAI Global, Sydney.
- Standards Australia (SA). 2018. *Construction of buildings in bushfire-prone areas*, AS 3959:2018. SAI Global, Sydney.

Appendix A: Asset Protection Zone and landscaping standards

The following APZ management specifications in Table 14 apply to the APZs specified in Table 5. These APZ management specifications should be considered for any landscaping and ongoing management within the subject land.

The APZs identified in Table 5 are to be maintained in perpetuity and management undertaken on an annual basis (as a minimum) and prior to the commencement of the fire season.

Further details on APZ implementation and management can be found on the NSW RFS website (<https://www.rfs.nsw.gov.au/resources/publications>).

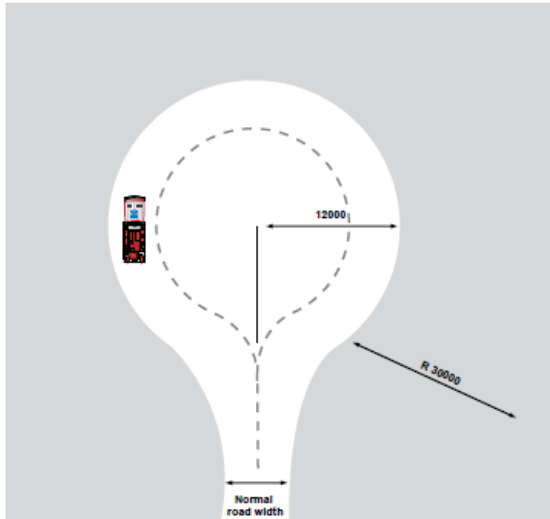
Table 14: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)
Trees	<ul style="list-style-type: none"> ● Tree canopy cover should be less than 15% at maturity; ● Trees (at maturity) should not touch or overhang the building; ● Lower limbs should be removed up to a height of 2 m above ground; ● Canopies should be separated by 2 to 5 m; and ● Preference should be given to smooth barked and evergreen trees.
Shrubs	<ul style="list-style-type: none"> ● Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided; ● Shrubs should not be located under trees; ● Shrubs should not form more than 10% ground cover; and ● Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
Grass	<ul style="list-style-type: none"> ● Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and ● Leaves and vegetation debris should be removed.

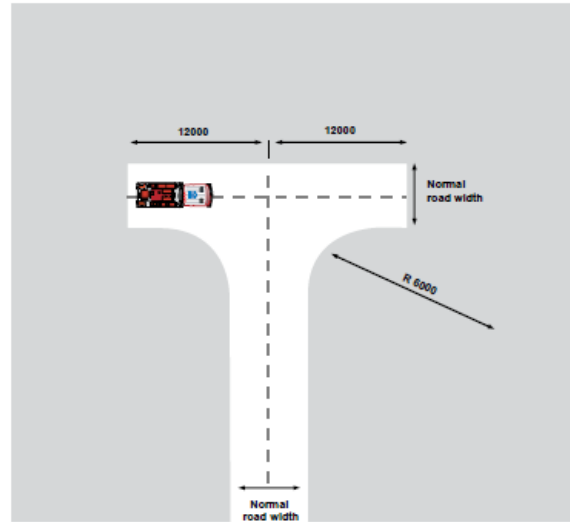
Appendix B: Emergency Service Vehicle Access

As per Appendix 3 of PBP (2019).

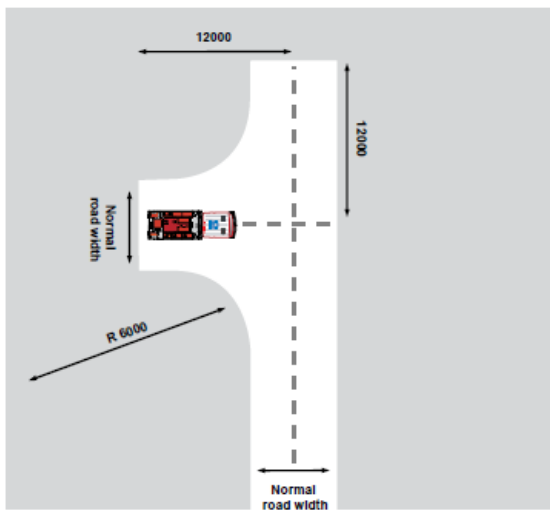
Type A



Type B



Type C



Type D

