

A stylized topographic map with green contour lines is positioned on the left side of the page, extending from the top left towards the bottom left. The lines represent elevation changes, with some forming circular peaks.

Bushfire Protection Assessment: Industrial Development – 44 Clunies Ross Street, Prospect

ISPT Pty Ltd

DOCUMENT TRACKING

Project Name	Bushfire Protection Assessment: Industrial Development 44 Clunies Ross Street Prospect
Project Number	20WOL_15098
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Status	Final
Version Number	v2
Last saved on	1 June 2020

This report should be cited as 'Eco Logical Australia 2020. *Bushfire Protection Assessment: Industrial Development 44 Clunies Ross Street Prospect*. Prepared for ISPT Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Aliro Group

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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
DA	Development application
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
FDI	Fire danger index
FFDI	Forest fire danger index
FDR	Fire danger rating
IPA	Inner protection area
NASH	National Association of Steel-framed Housing
OPA	Outer protection area
PBP	Planning for Bush fire Protection 2018
RF Act	<i>Rural Fires Act 1997</i>
RF Reg	<i>Rural Fires Regulation 2013</i>
RFS	NSW Rural Fire Service

1. Property and proposal

The table below (**Table 1**) identifies the subject property and outlines the type of development proposed.

Table 1: Subject site and development proposal summary

Street address:	44 Clunies Ross Street, Prospect
Postcode:	2148
Lot/DP no:	Lot 10 DP 1022044, Lot 63 DP 752051 & Lot 107 DP1028208
Local Government Area:	Blacktown City Council & Cumberland City Council
Fire Danger Index (FDI)	100
Current land zoning:	IN1 General Industrial
Type of development proposed:	Industrial

1.1 Description of proposal

The proposal is for the construction of 7 industrial warehouse and attached office buildings and accompanying facilities, landscaping and onsite parking (**Figure 1**).

The proposed development is located within the existing industrial area in Prospect. To the east is existing and developing residential areas with the M4 Western Motorway located on the north.

The subject land is not located on land classified as bush fire prone on the Blacktown City Council or Cumberland City Council (the Council's) bush fire prone land (BFPL) maps¹. However, the subject land has unmanaged vegetation to the north and south, and a bushfire assessment has been requested from the proponent to assess the risk from bushfire to the proposed development.

1.2 Assessment process

The proposal was assessed in accord with Section 8.3.1 and 8.3.10 '*Planning for Bush Fire Protection*' (RFS 2019), herein referred to as PBP. This report demonstrates that the proposal, together with the recommendations within this report conform to the relevant specifications and requirements under PBP.

This assessment is based on the following information sources:

- Background documentation provided by Aliro Group;
- Information contained within the site plan from SBA Architects dated 22.05.20;
- GIS analysis including online spatial resources (i.e. Google Earth, SIX Maps, Near Maps and the NSW Government Planning Portal); and

¹ <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

As the proposal does not include residential subdivision or special fire protection purpose (SFPP) developments (as defined by Section 100B of the *Rural Fires Act 1997*), the infill provisions of PBP relating to commercial and industrial development will apply to future buildings. PBP identifies the following specific provisions for Class 5-8 (as defined by the National Construction Code (NCC) that require addressing for this type of development.

As stated within Section 8.3.1 of PBP, 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 'Construction of buildings in bushfire-prone areas' (Standards Australia 2018) do not apply as a set of deemed to satisfy provisions. The general fire safety constructions provisions within the NCC are taken as acceptable solutions but the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning, and landscaping/vegetation management.

The objectives of PBP for this type of development are:

- to provide safe access to/from the public road system for firefighters providing property protection during a bushfire and for occupant egress for evacuation
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development
- to provide adequate services of water for the protection of buildings during and after the passage of bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to a building and;
- provide for the storage of hazardous materials away from the hazard wherever possible.

Table 2 identifies the bushfire protection measures assessed and whether an acceptable or performance solution is being proposed by the proponent.

Table 2: Summary of bushfire protection measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Criteria	Report Section
Asset Protection Zones	☒	☒	3.1
Landscaping	☒	☐	3.2
Construction standard	☒	☐	3.3
Access	☒	☐	3.4
Water supply	☒	☐	3.5
Electrical services	☒	☐	3.6
Gas services	☒	☐	3.7
Emergency Planning	☒	☐	3.8

1.3 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 been undertaken as part of this development proposal and addressed in a separate report (add ref to report and reference section).

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

1.4 Aboriginal cultural heritage

An assessment of any Aboriginal cultural heritage objects (within the meaning of the *National Parks and Wildlife Act 1974*) 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 bushfire protection measures (e.g. APZ) is clearly identified within this report and therefore capable of being assessed by suitably qualified persons as required. Blacktown City Council & Cumberland City Council are the determining authorities for this development; they will assess more thoroughly any potential Aboriginal cultural heritage issues.



2. Bushfire hazard assessment

2.1 Process

The assessment methodology set out in Appendix 1 of PBP has been utilised in this assessment to determine the required APZ and Construction requirements.

Figure 2 and **Table 3** show the effective slope and predominant vegetation representing the highest bushfire threat potentially posed to the development from various directions.

2.2 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 the OEH (2016) vegetation maps and revised where required by site assessment.

2.3 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.

2.4 Summary of assessment

The bush fire prone vegetation affecting the proposed development is a riparian corridor to the north and north west and is classified as 'Forested Wetland' under PBP. This vegetation is not continuous but is interspersed with areas of vegetation classified by PBP as 'Grassland' across the northern lot. The effective slope under the vegetation falls into the slope category of '>0-5 degrees downslope'. On the south east an electrical easement has a mixture of shrubby vegetation classified by PBP as 'Tall Heath' and 'Grassland' and a large undeveloped lot classified by PBP as 'Grassland'.

On the western and southern boundaries of the subject land, existing industrial development and managed gardens provide managed land. On north east the land is managed as existing industrial and residential development and associated public roads. Photos of vegetation are shown in **Appendix B**.

Table 3: Bushfire hazard assessment, APZ requirements and BALs

Transect #	Slope	Vegetation Formation	Required APZ (PBP 2019)	Proposed APZ	PBP 2019 Bushfire Attack Level (BAL)	Comments
Building 1						
T4 North	>0° to 5° downslope	Forested Wetland	12 m	≥34 m	BAL-12.5	APZ is wholly provided in subject land.
All other directions	Managed >100 m					
Building 2						
T1 West	>0° to 5° downslope	Forested Wetland	12 m	≥ 37m	BAL-12.5	APZ is wholly provided in subject land.
All other directions	Managed >100 m					
Buildings 3, 4 & 5						
T49 East	All upslope and flat land	Tall Heath	16 m	≥ 49 m	BAL-12.5	APZ is provided in subject land and adjoining public road.
T6 South East	All upslope and flat land	Tall Heath	16 m	≥ 16 m	BAL-29	APZ is provided in subject land and adjoining public road.
All other directions	Managed >100 m					
Building 6						
T7 East	All upslope and flat land	Tall Heath	16 m	≥72 m	BAL-12.5	APZ is wholly provided in subject land.
All other directions	Managed >100 m					
Building 7						
T3 North	>0° to 5° downslope	Forested Wetland	12 m	≥33 m	BAL-12.5	APZ is wholly provided in subject land.
T2 West	>0° to 5° downslope	Forested Wetland	12 m	≥8 m	BAL-FZ (BAL-FZ: ≤9 m); (BAL-40: 9-<12 m); (BAL-29: 12-<18 m).	APZ is wholly provided in subject land.
All other directions	Managed >100 m					

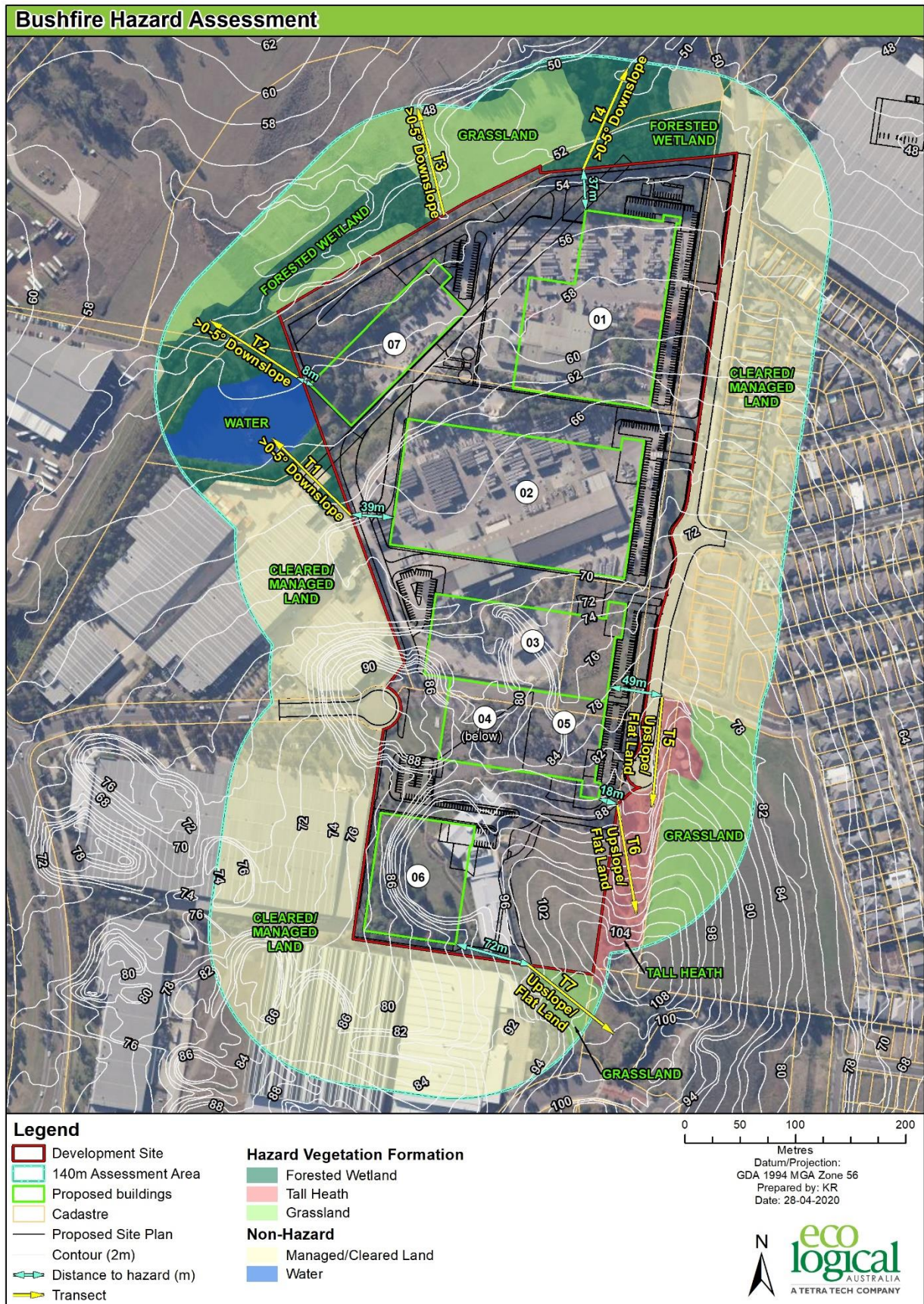


Figure 2: Bushfire hazard assessment



Figure 3: Bushfire Attack Levels (BAL)

3. Bushfire protection measures

3.1 Asset Protection Zones

Table 3 shows the dimensions of the available APZ and where relevant, information on how the APZ is to be provided is included. The distances of the APZ is also shown on **Figure 2**.

An APZ shall be established over the entire subject land and be maintained in perpetuity as an Inner Protection Area (IPA) as detailed in Appendix a.

The compliance of the proposed APZ with regards to Section 7.4 of PBP, is detailed in **Table 4**.

Table 4: 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 or A1.12.3 in Appendix 1.	Complies for buildings 1-6. Complies with performance criteria for building 7. An APZ is to be established over the entire subject land and maintained in perpetuity as an IPA as detailed in Appendix A . APZ provided in accordance with Table A1.12.5 as shown in Table 3 and Figure 2 .
APZs are managed and maintained to prevent the spread of a fire towards 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.	APZs are wholly within the boundaries of the development site.	Complies APZ located wholly within development site.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	Complies APZ is not located on slopes greater than 18°.

3.2 Landscaping

The compliance of the proposed landscaping with regards to Section 7.4 of PBP is detailed in **Table 5**.

Table 5: 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 managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Compliance with the NSW RFS 'Asset protection zone standards' (Appendix 4 PBP); A clear area of low-cut lawn or pavement is maintained adjacent to the house; Fencing is constructed in accordance with Section 7.6 of PBP; Trees and shrubs are located so that: - 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.	To comply APZ / Landscaping is to be managed in accordance with PBP. Landscaping specifications provided in Appendix A. Fencing to be constructed in accordance with Section 7.6 of PBP.

3.3 Construction standards

A BAL map is provided in Figure 3 demonstrating the potential exposure of the proposal to differing BALs.

The building construction standard for proposed buildings is based on determination of the Bushfire Attack Level (BAL) in accordance with PBP and then applying the appropriate construction specifications based on this rating and the selected standard for construction in bushfire prone areas. The separation distances for different BALs are provided in **Table 3**.

The compliance of the proposed construction of dwellings with regards to Section 7.4 of PBP is detailed in **Table 6**.

Table 6: 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 the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.5 to A1.12.7 of PBP.	Complies BAL determined using Table A1.12.5 of PBP.
	Construction provided in accordance with the National Construction Code (NCC) and as modified Section 7.5 of PBP.	Can comply Construction in accordance with AS 3959 or NASH standard as modified by Section 7.5 of PBP is required.
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 3.3.4 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.	Can comply Specification detailed in Section 3.3.5 of this report.

3.3.1 Bushfire Attack Level (BAL)

The building construction standard is based on the determination of the BAL in accordance with Appendix 1 of PBP. The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

BALs within the proposed development range from BAL-FZ to BAL-12.5 as identified in **Table 3** and **Figure 3**.

The following BALs apply to the proposed development:

- Warehouse & Office 1: BAL 12.5
- Warehouse & Office 2: BAL 12.5
- Warehouse & Office 3, 4 & 5 (1 Building):
 - Entire roof and floor: BAL 29
 - Southern facades: BAL 29
 - Eastern facades: BAL 29
 - Western facades: BAL 19
 - Northern facades: BAL 19
- Warehouse & Office 6: BAL 12.5
- Warehouse & Office 7: BAL FZ

3.3.2 Construction requirements

The Deemed to Satisfy (DtS) provisions of the NCC for construction requirements for buildings in designated bush fire prone areas are specified in:

- AS 3959:2018 Construction of buildings in bushfire prone areas (SA 2018); and
- NASH Standard: Steel Framed Construction in Bushfire Areas 2014 (NASH 2014).

Construction shall comply with Sections 3, 5 (BAL-12.5), 6 (BAL-19), and 7 (BAL-29) of AS 3959:2018 (SA 2018) or NASH Standard 1.7.14 (NASH 2014) as appropriate.

The NCC excludes both AS 3959 and the NASH Standard as a Deemed to Satisfy solution for buildings that are required to be constructed to BAL-FZ but should still be used as a basis for a performance based solution demonstrating compliance with the performance requirements of the NCC and PBP for construction in the flame zone. For BAL-FZ, construction shall comply with Sections 3 and 9 (BAL-FZ) of AS 3959:2018 (SA 2018).

3.3.3 Additional construction requirements

Additional ember protection provisions identified in Section 7.5 of PBP, as modified by the NSW state variation of the NCC, applies as required.

3.3.4 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 is within 6 m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

3.3.5 Class 10a buildings (sheds etc.)

The proposed development does not include Class 10a building. However, to be compliant with section 8.3.2 of PBP, proposed Class 10a structures within 6 m of any proposed building must be constructed in accordance with the NCC. Where the structure is greater than 6 m, no bushfire requirements apply.

3.4 Access

Access to the subject land via access roads off Clunies Ross Street. The subject land can be accessed by 4 access points on Clunies Ross Street and an alternative access from Foundation Place.

The compliance of the proposed property access with regard to 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.	Property access roads are two-wheel drive, all weather roads	Complies Multiple access roads throughout the site are two-wheel drive, all weather roads.
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; There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Can comply Static water supply not proposed.
Firefighting vehicles can access the dwelling and exit the property safely.	At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;	Complies Access road has 4 entry points from Clunies Ross Street and 2 exit points to Foundation Place.
	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply:	Not applicable
	Minimum 4m carriageway width;	Complies

Performance Criteria	Acceptable Solutions	Compliance notes
	In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;	Not applicable
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;	Can comply
	Provide a suitable turning area in accordance with Appendix 3 of PBP;	Can comply
	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;	Can comply
	The minimum distance between inner and outer curves is 6m;	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;	
	A development comprising more than three dwellings has access by dedication of a road and not by right of way.	Not Applicable
	Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. the gradients applicable to public roads also apply to community style development property access roads in addition to the above.	Not Applicable

3.5 Water supplies

The compliance of the proposed water supply with regards to 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 Proposal serviced by a reticulated water.
Water supplies are located at regular intervals; and	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

Performance Criteria	Acceptable Solution	Compliance Notes
The water supply is accessible and reliable for firefighting operations.		certification of design and installation in accordance with relevant legislation, Australian Standards and Table 5.3c and Table 5.3d 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	

3.6 Electricity services

The compliance of the proposed supply of electricity services with regards to Section 7.4a of PBP is detailed in **Table 9**.

Table 9: Requirements for the supply of Electricity services (adapted from Table 5.3c 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).	To comply The existing electricity supply to the subject land is above ground. 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

3.7 Gas services

The compliance of the proposed supply of gas services (reticulated) with regards to Section 7.4 of PBP is detailed in **Table 10**:

Table 10: Requirements for the supply of gas services (adapted from Table 5.3c 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, 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.	To comply Reticulated gas proposed. 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.

3.8 Emergency and Evacuation Planning

Whilst bush fire is not captured in the NCC for industrial and commercial developments (Class 5-8 buildings), the objective of the development is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development. The compliance of the proposed emergency and evacuation planning with regards to Section 8.3.1 of PBP is detailed in **Table 11**:

Table 11: Requirements for emergency management (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
A bushfire emergency and evacuation management plan is prepared.	A Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: <i>A Guide to Developing a Bush fire Emergency Management and Evacuation Plan</i> , and the AS 3745:2010.	To comply

4. Conclusion

The proposed development comprising of the construction of 7 warehouses and attached offices complies with the aim and objectives of *Planning for Bush Fire Protection 2019* in accordance with Section 4.14 (formerly 79BA) of the *Environmental Planning and Assessment Act 1979*.

Table 12: Development Bushfire Protection Solutions and Recommendations

Bushfire Protection Measures	Recommendations	Acceptable Solution	Performance Criteria	Report Section
Asset Protection Zones	An APZ is to be established over the entire subject land and maintained in perpetuity as an IPA as detailed in Appendix A. APZ dimensions are detailed in Table 3 and shown in Figure 2 . Identified APZ to be maintained in perpetuity to the specifications detailed in Appendix A .	☒	☒	3.1
Landscaping	Any future landscaping meets the requirements of PBP listed in Appendix A .	☒	☐	3.2
Construction standard	The proposed buildings are exposed to a maximum of BAL-FZ. The following BAL level applies: - Warehouse & Office 1: BAL 12.5; - Warehouse & Office 2: BAL 12.5; - Warehouse & Office 3, 4 & 5 (1 Building): - Entire roof and floor: BAL 29; - Southern facades: BAL 29; - Eastern facades: BAL 29; - Western facades: BAL 19; - Northern facades: BAL 19; - Warehouse & Office 6: BAL 12.5; - Warehouse & Office 7: BAL FZ.	☒	☐	3.3
Access	Access to meet standards summarised in Table 7 .	☒	☐	3.4
Water supply	Reticulated water supply to meet PBP acceptable solution summarised in Table 8 .	☒	☐	3.5
Electricity service	Electricity supply to meet PBP acceptable solution summarised in Table 9 .	☒	☐	3.6
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	☒	☐	3.7
Emergency and Evacuation Planning	A Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: <i>A Guide to Developing a Bush fire Emergency Management and Evacuation Plan</i> , and the AS 3745:2010.	☒	☐	3.8

5. Recommendations

The proposal will be able to satisfy Section 8.3.1 and 8.3.10 and the aims and objectives of PBP for non-habitable development.



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Appendix A - Asset protection zone and landscaping standards

The following APZ management specifications in **Table 13** apply to the APZs specified in **Table 3** and shown in **Figure 2**. These APZ management specifications should be considered for any landscaping and ongoing management within the subject land.

The APZs identified in **Table 3** 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 13: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)	Outer Protection Area (OPA)
Trees	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.	Tree canopy cover should be less than 30%; and Canopies should be separated by 2 to 5 m.
Shrubs	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.	Shrubs should not form a continuous canopy; and Shrubs should form no more than 20% of ground cover.
Grass	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.	Should be kept mown to a height less than 100 mm; and Leaf and other debris should be removed.

Appendix B - Photos



Photo 1: View of Dam and vegetation on northern western elevation



Photo 2: View of vegetation on northern elevation

