

Bushfire Risk Assessment

Proposed Industrial Development
50 Meatworks Ave, Oxford Falls

Prepared for
Gelder Architects



Project Name:	Industrial Development at Meatworks Ave, Oxford Falls
Site Details	50 Meatworks Ave, Oxford Falls 100/-/DP1023183
Client Details:	Mr. Stuart Gelder Gelder Architects 22/19-23 Bridge St, Pymble NSW 2073
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Version	Primary Author(s)	Description	Date Completed
1.2	Lew Short	Final	18 November 2019



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Fire Protection Association of Australia BPAD Level 3 BPD-PA 16373



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1. Summary

Table 1 is a summary of compliance with relevant documents and approaches to limit bushfire attack and meet the requirements of the NSW planning framework for new development in Bushfire Prone Areas.

Table 1 Summary

Planning for Bushfire Protection 2018 Classification	"Other" commercial/ industrial
Location	50 Meatworks Ave, Oxford Falls 100/-/DP1023183
Local Government Area	Northern Beaches Council
Can this proposal comply with AS3959, 2009	Yes
Does this development comply with the requirements of <i>Planning for Bushfire Protection 2018</i>?	YES
Does this development comply with the Aims and objectives of <i>Planning for Bushfire Protection 2018</i>?	YES
Is referral to the NSW RFS required?	YES

Assessment Framework	☐ <i>Planning for Bushfire Protection 2006</i> ☒ <i>Planning for Bushfire Protection 2018</i> ☐ Meets the deemed to satisfy provisions ☒ Alternate solution/ performance-based assessment
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2. Introduction

Blackash Bushfire Consulting has been engaged by Gelder Architects to provide a Bushfire Hazard Assessment report to support a Development Application (DA) for an extension of existing industrial development at 100 Meatworks Ave, Oxford Falls (figure 1) which is legally known as Lot 100/- /DP1023183 (the site).

The site has an existing approval for Industrial Development which is currently being constructed (Figure 2). Stage 2 is to the south of the approved development and is shown in Figure 2. Pre DA meetings have been held with Northern Beaches Council. Council did not want additional clearing of vegetation on the site or adjoining the site. The client and design team have provided a scheme that utilises the existing developed areas within the site.

The existing residence (see Figure 2) will be demolished and replaced with a new building built to BAL Flame Zone. The new building is 7.5m from the rear boundary and is further from the rear boundary than the existing residence. Most of this building is below ground with 1 floor above ground. The southern façade is protected and will be built to BAL FZ.

The site has bushfire prone land surrounding it and bushfire has been a key consideration in the design process. Commercial and industrial development is designated as “other” development in PBP 2018. As “other” development, the proposed development has considerable flexibility and the nature of the development being concrete tilt slab, brickwork and FC panels results in the structures providing a higher degree of bushfire resistance that required by the NSW Rural Fire Service (RFS).

As “other” development, a key issue for the proposal will be meeting the aim and objectives of *Planning for Bushfire Protection* and the performance requirements for commercial and industrial development.

The proposed new building and the site is required to respond and implement an appropriate level of bushfire protection measures, as per *Planning for Bushfire Protection 2018* (PBP 2018) to provide a “better bushfire outcome” than currently exists on site. This report will demonstrate that an appropriate combination of protection measures has been considered and achieved to provide compliance with the intent and performance measures within PBP 2018.

This proposal has been prepared in accordance with the pre-release version of PBP 2018 in its entirety and the development complies with all relevant Acceptable Solutions in this version of PBP.

This assessment has been prepared by Lew Short, Principal Bushfire & Emergency Management (FPAA BPAD Level 3 Certified Practitioner No. BPD-L3-28853) who is recognised by the NSW Rural Fire Service (RFS) as qualified in bushfire risk assessment and have been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals. A site inspection was completed on 3 May 2019.

Figure 1 Site Location

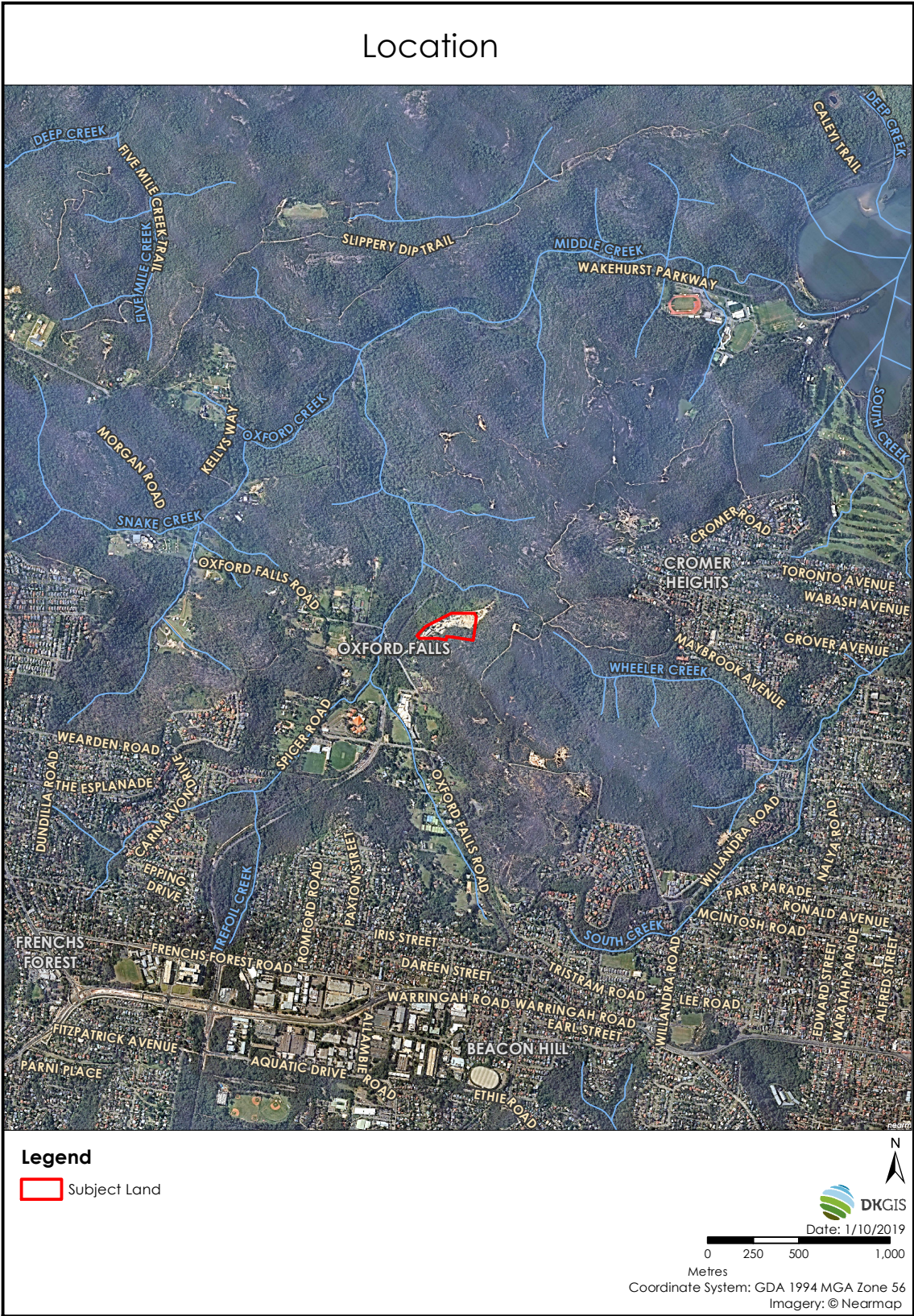
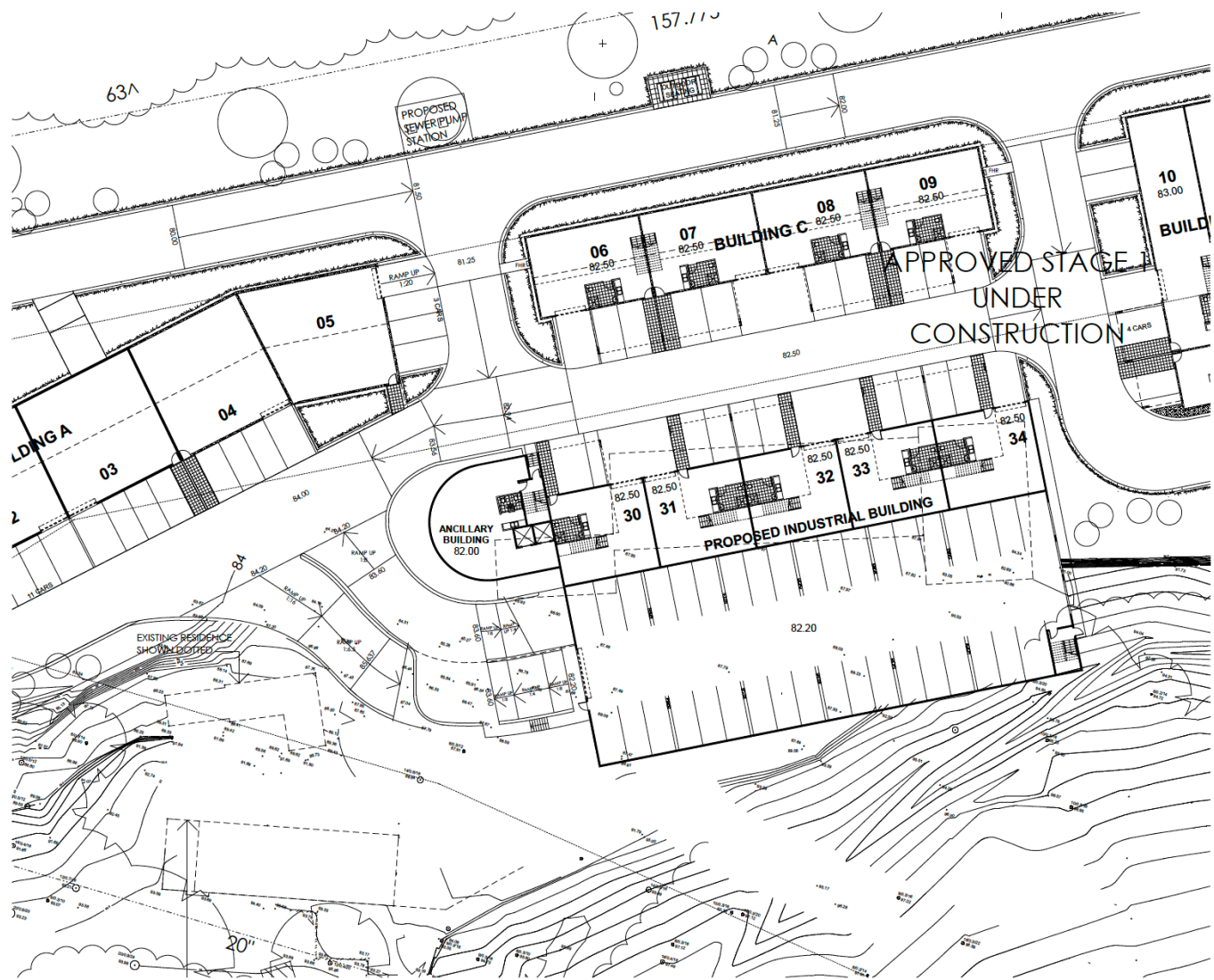


Figure 2 Approved Development Under Construction and Proposed Building



STAGE 2 AREAS

COMMERCIAL/INDUSTRIAL BUILDING	
Level 1	598.87sqm
Roof Terrace Level	485.83sqm
Upper Roof Level	347.54sqm
TOTAL	1432.24sqm

ANCILLARY BUILDING	
Ground Level	125.99sqm
Carpark Level	126.30sqm
Level 1	145.69sqm
TOTAL	397.98sqm

UNITS 30-42	
Unit 30	152.38sqm
Unit 31	151.43sqm
Unit 32	151.43sqm
Unit 33	151.43sqm
Unit 34	152.13sqm
Unit 35	120.58sqm
Unit 36	120.13sqm
Unit 37	120.13sqm
Unit 38	120.13sqm
Unit 39	120.82sqm
Unit 40	397.78sqm
Unit 41	278.69sqm
Unit 42	280.87sqm
TOTAL	2317.93sqm

OVERALL TOTAL STAGE 2 4148.15sqm

C	PRELIMINARY CONSULTANT ISSUE	09/08/19
B	REVISED STAGE 2	19/09/18
A	PRELIMINARY CONSULTANT ISSUE	04/05/18
ISSUE	AMENDMENT	DATE

Proposed Industrial Development
at
Mechworks Avenue
Oxford Falls 2100
for
Mr W Edwards

gelder ARCHITECTS
ARCHITECTS
INTERIORS
LANDSCAPE

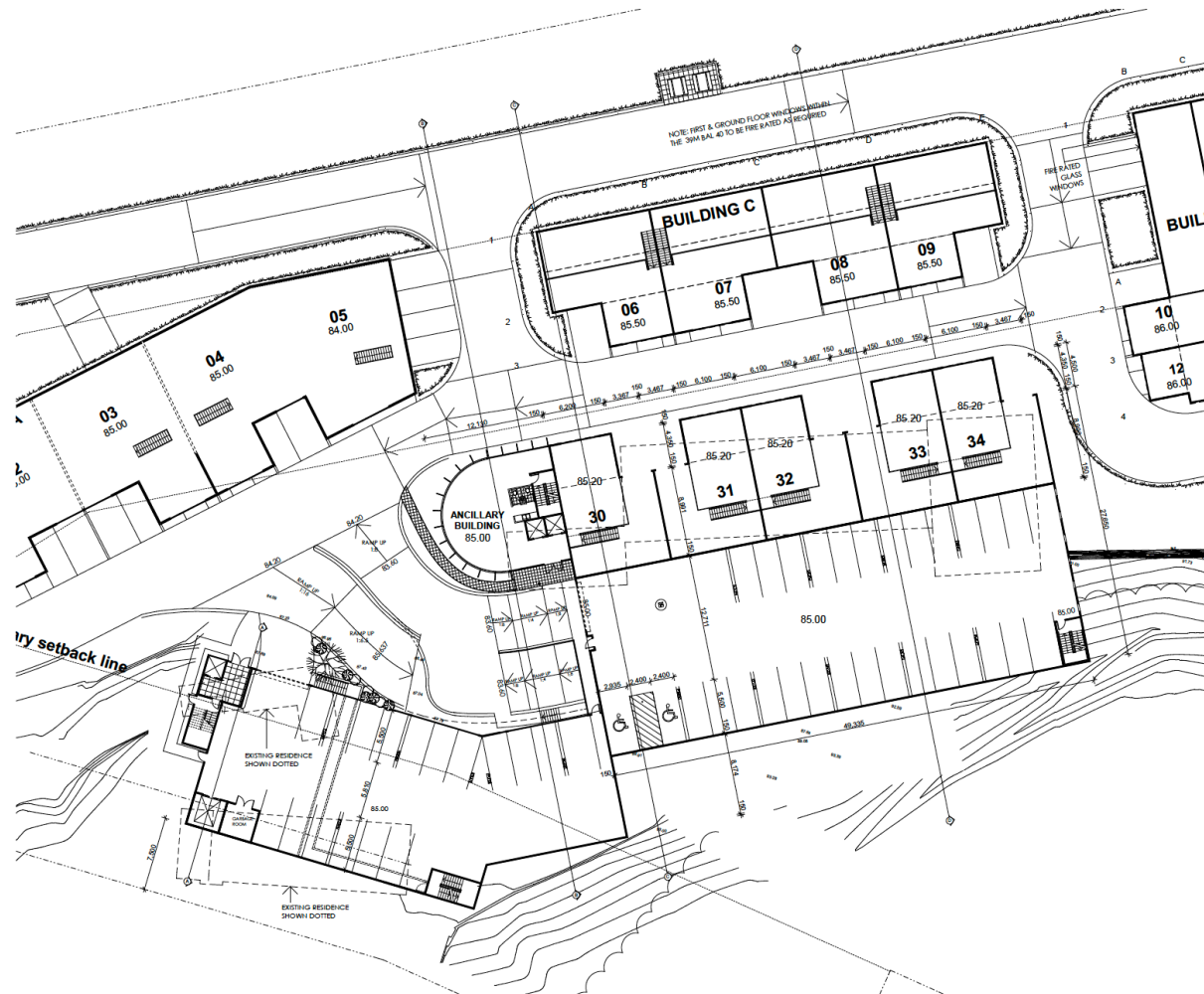
LEVEL 2 19-23 BRIDGE STREET
PYRMONT NSW 2073 AUSTRALIA
T: (02) 9442 2445
E: info@gelder.com.au
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Ground floor Stage 2

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Date: Jan 2009	Project No: 823	Author:
Drawn: 1:100	Shading: No	
Date Plotted: 13 Aug 19	DA01	C

Figure 2 Proposed Building showing commercial building – note existing residence dotted line



	DRIVEWAY REVISION COMMERCIAL INDUSTRIAL BLD REVISION	30/09/2017
D	UPDATED CONSULTANT ISSUE	06/09/2017
C	PRELIMINARY CONSULTANT ISSUE REVISED STAGE 2	02/08/2017
B	UPDATED CONSULTANT ISSUE	19/09/2016
A	PRELIMINARY CONSULTANT ISSUE	04/09/2016
ISSUE	DATE	

Proposed Industrial
Development
at
Meatworks Avenue
Oxford Falls 2100
for
Mr W Edwards

gelder architectuere
interiors
interactions

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Ground floor mezzanine Stage
2

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Scale: 1 : 100	Drawing No: DA02	
Date Plotted: 03-Oct-19		

3. Legislative Framework

The site is identified as 'bushfire prone land' (see Figure 3) for the purposes of Section 10.3 of the *Environmental Planning and Assessment Act, 1979* (EPA Act) and the legislative requirements for development on bushfire prone lands are applicable.

All development on bushfire prone land must consider and comply with PBP 2018. However, industrial development has considerable flexibility and the nature of the development often results in the structures providing a higher degree of bushfire resistance than required by the RFS.

The Development Application is not nominated as integrated development under section 4.46 of the EP&A Act. Development on land that is identified as being bushfire prone must comply with PBP under s.4.14 of the EP&A Act, unless the consent authority has consulted with the NSW RFS.

As "other" development, the proposed industrial development is addressed through demonstrating compliance with the aim and objectives of PBP.

Under the building classification system within the *National Construction Code* (NCC), Class 5 to 8 buildings include offices, shops, factories, warehouses, public car parks and other commercial and industrial facilities. The NCC does not provide for any bushfire specific performance requirements for these particular classes of building. As such the *Australian Standard for Construction of Buildings in Bushfire Prone Areas* (AS 3959) and the NASH Standard are not considered as a set of 'deemed to satisfy' provisions. However, compliance with AS 3959 and NASH should be considered when meeting the aims and objectives of PBP.

Whilst bushfire is not captured in the NCC for Class 5-8 buildings, PBP 2018¹ articulates the following objectives which will be applied in relation to access, water and services, and emergency and evacuation planning:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- to 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;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development; and

¹ Planning for Bushfire Protection 2018 p. 84

- consideration of storage of hazardous materials away from the hazard wherever possible.

The general fire safety construction provisions (of the NCC) are taken as acceptable solutions however construction requirements for bushfire protection will need to be considered on a case-by-case basis.

4. The Proposal

The site has been used for a number of years by AE Briggs as a recycling facility for building and construction drop off recycling centre specialising in recycling bricks and concrete to make 10mm, 20mm & 40/70 aggregate, roadbase and crusher dust.

The application seeks Northern Beaches Council's consent for the expansion of the approved industrial development at the site. The Stage 1 works is under construction and was subject to appeal at the Land and Environment Court which was successfully won by the applicant.

The Stage 2 works builds on the approved Stage 1 utilising common access and other services. Figure 3 shows the Stage 2 works in context of the approved Stage 1 work.

Figure 3 Stage 2 Proposal within Context of broader site (source Paul Scrivener Landscape Architects)



The development comprises units 30 – 42, a separate commercial/ industrial building and associated underground parking areas. The proposal will utilise the existing cut areas of the recycling plant to reduce bulk and exposure and will blend in the associated landforms.

A full set of architectural plans are provided with the application.

5. Revision of Planning for Bushfire Protection 2006

The RFS have reviewed Planning for Bushfire Protection 2006 (PBP 2006). It is anticipated that PBP 2018 will become legislated in late 2019. Until then, PBP 2018 is in a 'pre-release' stage, also known as the transitional period. Until PBP 2018 becomes legislated, PBP 2006 will remain the legally referenced document and PBP 2018 can be used on a performance basis in consultation with NSW RFS only.

PBP 2018 represents best practice and the most current version of bushfire planning and building requirements available.

The interim period between the pre-release version being released in September last year and when the new version is legislated is the only "transitional period" proposed. During this period, the BPAD practitioner can either rely on PBP-2006 or the pre-release version of PBP-2018 or any updated final version of PBP when released (likely to be known as PBP-2019). As Blackash have chosen to reflect best practice and utilise PBP 2018, the proposals cannot be considered to meet the Specifications and Requirements of PBP2006 and will therefore be referred to the NSW RFS in accordance with the NSW EP&A Act section 4.14.

This report has been prepared in accordance with the pre-release version of PBP 2018 in its entirety and the development complies with all relevant Acceptable Solutions in PBP 2018.

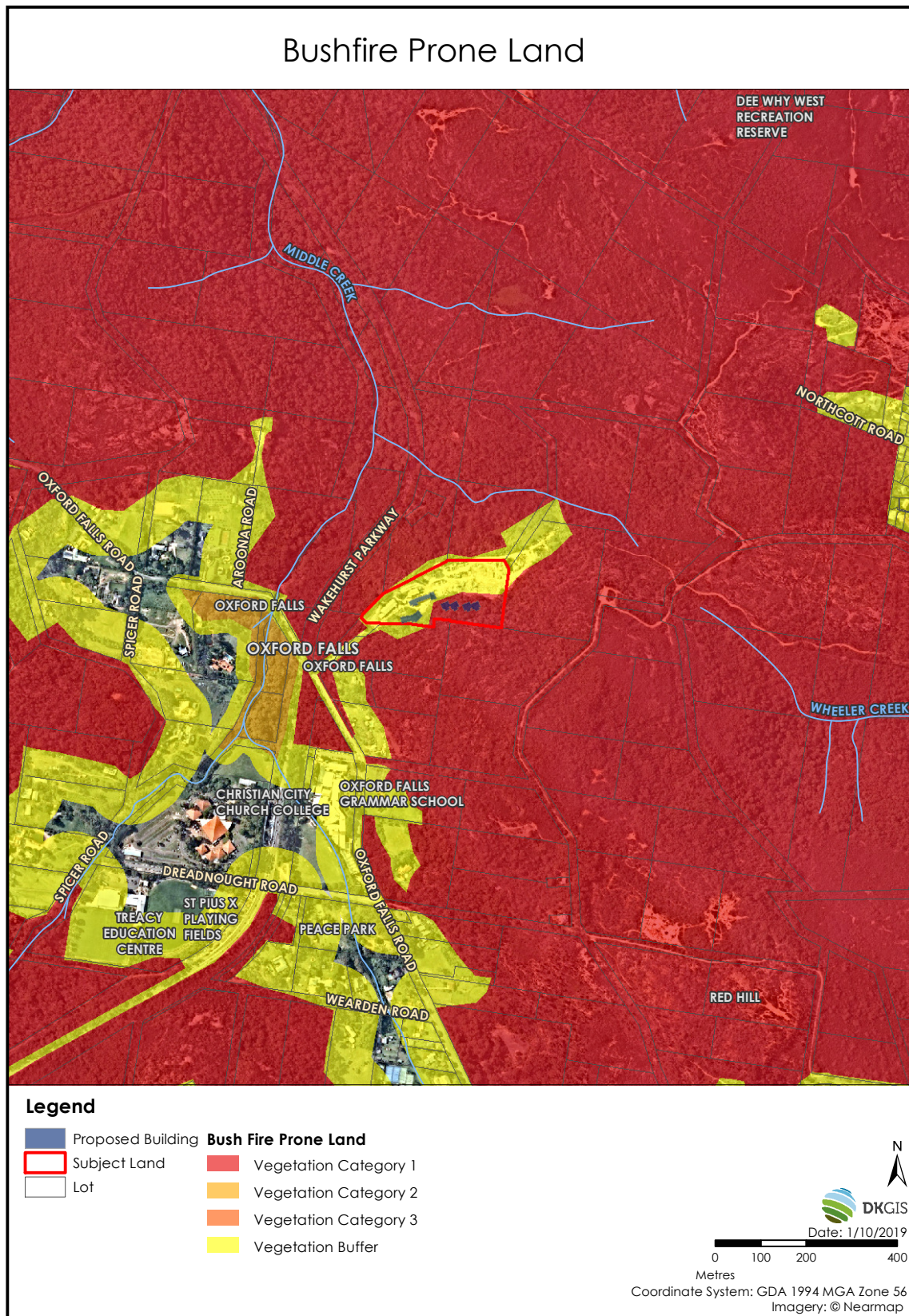
6. Bushfire Prone Land

Bushfire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone.

Bushfire prone land (**BFPL**) is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. Bushfire prone land maps are prepared by local council and certified by the Commissioner of the NSW RFS.

Figure 4 shows the Bushfire Prone Land Map for the site. The extract from the Bushfire Prone Map shows that the land is affected by adjoining bushfire prone land buffer to the site. Surrounding land is Category 1 and associated buffers within the cleared areas of the current recycling plant.

Figure 4 Bushfire Prone Land Map



7. Site Assessment Methodology

The Bushfire Assessment Report is based on a desktop and site assessment of the site utilising the following resources:

- *Planning for Bushfire Protection* (NSW RFS, 2018);
- Aerial mapping;
- Detailed GIS analysis.

This assessment is based on mapping of vegetation formations and slope assessment in accordance with PBP 2018. The methodology used in this assessment is in accordance with PBP 2018 and is outlined in the following sections.

7.1. Bushfire Hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (**APZ**) locations and dimensions and future building levels.

The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behaviour at the site, and which determine the planning and building response of PBP 2018.

7.2. Fire Weather

The fire weather is dictated by PBP 2018 and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds. The site has a Fire Danger Index (**FDI**) of 100 as per PBP 2018.

7.3. Vegetation

Predominant Vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description using PBP 2018. Vegetation types give rise to radiant heat and fire behaviour characteristics.

The predominant vegetation is determined over a distance of at least 140 metres in all directions from the proposed site boundary or building footprint on the development site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

The land around the site is identified as bushfire prone land (see Figure 4) and is made up of forest vegetation close to the proposal which grades down to heathland to the south of the site. (see Figure 5).

Forest vegetation surrounds the development with a narrow pocket of heath at the southern side of the main entry off Meatworks Ave. The existing site is cleared and managed to meet APZ standards.

Figure 5 Vegetation and Slope



7.4. Slopes Influencing Bushfire Behavior

The 'effective slope' influencing fire behaviour approaching the sites has been assessed in accordance with the methodology specified within PBP 2018. This is conducted by measuring the worst-case scenario slope where the vegetation occurs over a 100 m transect measured outwards from the development boundary or the existing/ proposed buildings.

The slope affecting the site is 5 – 10 degrees top the north of the site, 0 – 5 degrees downslope to the east and upslope to the south (See Figure 5).

7.5. Asset Protection Zones

An Asset Protection Zone (APZ) is a buffer zone between a bush fire hazard and buildings. The APZ is managed progressively to minimise fuel loads and reduce potential radiant heat levels, flame, smoke and ember attack. The appropriate APZ distance is based on vegetation type, slope and the nature of the development.

The APZ can include roads or properties managed to be consistent with APZ standards set out in RFS document *Standards for Asset Protection Zones*.

The APZ provides a fuel-reduced, physical separation between buildings and bush fire hazards is a key element in the suite of bush fire measures and dictates the type of construction necessary to mitigate bushfire attack.

PBP 2018 requires APZs for commercial and industrial development to be based on a radiant heat load of 40kWm². Required APZ and construction levels from PBP 2018 are shown in table 2. APZs are shown in Figure 6 and meet the requirements of PBP 2018 to provide a defensible space and minimises material ignition. The development provides the required APZ.

The site will be managed and maintained to prevent the spread of a bushfire towards the building and to prevent the spread of fire onto or from the site in accordance with section 63 of the Rural Fires Act, 1997 (RF Act). The areas around the buildings is cleared and maintained to mineral earth or non-combustible surfaces and is not a fire hazard.

Figure 6 Asset Protection Zones

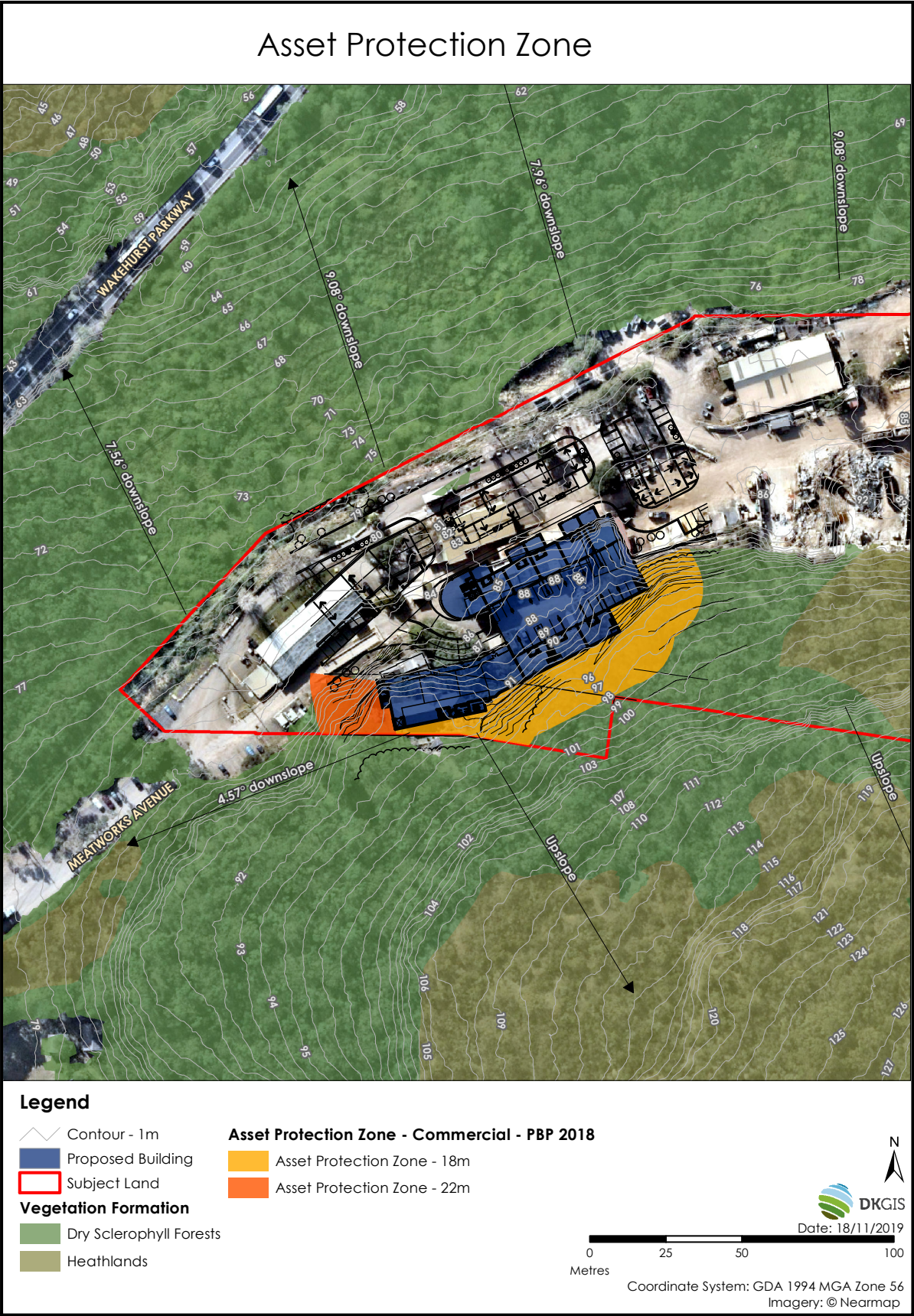


Table 2 APZ and Construction Levels

Direction from development	Slope ¹	Vegetation ²	PBP 2018 required APZ ³	Proposed APZ ⁴	AS3959 Construction Standard ⁴	Compliance
North	5 – 10 degrees downslope	Forest	22m	42m	BAL 40	APZ provided within property boundaries
East	Upslope and developed	Forest	22m	22m	BAL 40	
South	Upslope	Forest	18m	18m or to the site boundary for the proposed commercial building 7.5m for eastern building	BAL Flame Zone	
West	0 – 5 degrees downslope	Forest	22m	22m	BAL 40	

1 Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP 2018.

2 Predominant vegetation is identified, according to PBP 2018 and “Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate”.

3 Assessment according to Table A1.12.5 of PBP 2018.

7.6. Bushfire Attack Levels

The Bushfire Attack Level (**BAL**) is a means of measuring the severity of a building's or sites potential exposure to ember attack, radiant heat and direct flame contact. In the Building Code of Australia, the BAL is used as the basis for establishing the requirements for construction to improve protection of building elements.

The Bushfire Attack Levels to the site has been completed from PBP 2018 Table A1.12.5 and is shown in Table 2.

As "Other" development, the development must comply with objective 3 of PBP 2018 which requires that the development:

3. *provide appropriate separation between a hazard and buildings which, in combination with other measures, minimises material ignition*

Asset Protection Zones (will be provided around the development that will include perimeter roads and hardstand areas. The buildings will be non-combustible and have APZs provided meet Objective 3.

The building requirements for design and construction vary according to the bushfire attack level that a development falls into. The building requirements for each BAL are set out in *Australian Standard: 3959 Construction of buildings in bushfire-prone areas 2009 (AS3959)*.

The various bushfire attack levels and the associated construction requirements are shown in Table 2. The site is afforded separation from the hazard resulting in the site being affected by BAL 40 and BAL FZ on the southern elevation to minimise vegetation clearing and environmental impact. Due to the site boundary being close to the proposed commercial building, part of this building will be in BAL FZ. Figure 6 shows the deemed to satisfy APZ for PBP 2018. However, the site will be managed only to the boundary and will not extend into adjoining lands.

It is proposed to manage the APZ to the site boundary and build to the BAL FZ. PBP 2006 provides for flame zone buildings in the provided that a defendable space is provided for fire fighters which has been provided in the form of an APZ and that materials do not ignite. This has been achieved by the building being designed and built to BAL FZ.

BAL-40 appreciates that increased attack from burning debris with significant radiant heat and the potential for flame contact. The extreme radiant heat and potential flame contact could threaten

building integrity. The buildings have been designed and constructed in a manner that can withstand the extreme heat and potential flame contact.

Emergency management arrangements through a separate Bushfire Emergency Management and Evacuation Plan will be provided prior to occupation that will include triggers for closing the site and what to do in the event of a bushfire emergency.

Table 3 Bushfire Attack Levels (source PBP 2018 Table A1.12.5)

Table A1.12.5

Determination of bush fire attack level, FDI 100 – residential developments

KEITH VEGETATION FORMATION		BUSH FIRE ATTACK LEVEL (BAL)				
		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
		Distance (m) asset to predominant vegetation class				
ALL UPSLOPE AND FLAT LAND	Rainforest	< 8	8 -< 11	11 -< 16	16 -< 23	23 -< 100
	Forest (Shrubby and Grassy) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 18	18 -< 24	24 -< 33	33 -< 45	45 -< 100
	Woodland (grassy and woody)	< 9	9 -< 12	12 -< 18	18 -< 26	26 -< 100
	Forested Wetland	< 7	7 -< 10	10 -< 14	14 -< 21	21 -< 100
	Tall Heath	< 11	11 -< 15	15 -< 21	21 -< 30	30 -< 100
	Short Heath	< 7	7 -< 10	10 -< 15	15 -< 21	21 -< 100
	Arid-Shrublands (acacia and chenopod)	< 5	5 -< 7	7 -< 10	10 -< 15	15 -< 100
	Freshwater Wetlands	< 5	5 -< 6	6 -< 9	9 -< 13	13 -< 100
	Alpine Complex	< 5	5 -< 7	7 -< 10	10 -< 14	14 -< 100
	Grassland	< 8	NOT APPLICABLE			8 -< 50
0 > 5 DEGREES – DOWNSLOPE	Rainforest	< 11	11 -< 14	14 -< 21	21 -< 29	29 -< 100
	Forest (Shrubby and Grassy) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 22	22 -< 29	29 -< 40	40 -< 54	54 -< 100
	Woodland (grassy and woody)	< 12	12 -< 16	16 -< 23	23 -< 32	32 -< 100
	Forested Wetland	< 9	9 -< 12	12 -< 18	18 -< 26	26 -< 100
	Tall Heath	< 12	12 -< 16	16 -< 24	24 -< 33	33 -< 100
	Short Heath	< 8	8 -< 11	11 -< 16	16 -< 24	24 -< 100
	Arid-Shrublands (acacia and chenopod)	< 6	6 -< 8	8 -< 11	11 -< 17	17 -< 100
	Freshwater Wetlands	< 5	5 -< 7	7 -< 10	10 -< 15	15 -< 100
	Alpine Complex	< 6	6 -< 8	8 -< 11	11 -< 16	16 -< 100
	Grassland	< 9	NOT APPLICABLE			9 -< 50
5 > 10 DEGREES – DOWNSLOPE	Rainforest	< 14	14 -< 18	18 -< 26	26 -< 37	37 -< 100
	Forest (Shrubby and Grassy) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 28	28 -< 37	37 -< 49	49 -< 65	65 -< 100
	Woodland (grassy and woody)	< 15	15 -< 20	20 -< 28	28 -< 39	39 -< 100
	Forested Wetland	< 12	12 -< 16	16 -< 23	23 -< 33	33 -< 100
	Tall Heath	< 14	14 -< 18	18 -< 27	27 -< 37	37 -< 100
	Short Heath	< 9	9 -< 13	13 -< 19	19 -< 27	27 -< 100
	Arid-Shrublands (acacia and chenopod)	< 6	6 -< 9	9 -< 13	13 -< 19	19 -< 100
	Freshwater Wetlands	< 6	6 -< 8	8 -< 11	11 -< 17	17 -< 100
	Alpine Complex	< 6	6 -< 8	8 -< 13	13 -< 19	19 -< 100
	Grassland	< 10	NOT APPLICABLE			10 -< 50
10 > 15 DEGREES – DOWNSLOPE	Rainforest	< 17	17 -< 23	23 -< 34	34 -< 46	46 -< 100
	Forest (Shrubby and Grassy) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 35	35 -< 45	45 -< 60	60 -< 77	77 -< 100
	Woodland (grassy and woody)	< 19	19 -< 25	25 -< 36	36 -< 49	49 -< 100
	Forested Wetland	< 15	15 -< 20	20 -< 29	29 -< 41	41 -< 100
	Tall Heath	< 15	15 -< 21	21 -< 30	30 -< 41	41 -< 100
	Short Heath	< 10	10 -< 14	14 -< 21	21 -< 30	30 -< 100
	Arid-Shrublands (acacia and chenopod)	< 7	7 -< 10	10 -< 15	15 -< 22	22 -< 100
	Freshwater Wetlands	< 6	6 -< 9	9 -< 13	13 -< 19	19 -< 100
	Alpine Complex	< 7	7 -< 10	10 -< 14	14 -< 21	21 -< 100
	Grassland	< 11	NOT APPLICABLE			11 -< 50
15 > 20 DEGREES – DOWNSLOPE	Rainforest	< 23	23 -< 30	30 -< 42	42 -< 56	56 -< 100
	Forest (Shrubby and Grassy) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 46	46 -< 57	57 -< 73	73 -< 93	93 -< 100
	Woodland (grassy and woody)	< 24	24 -< 32	32 -< 44	44 -< 59	59 -< 100
	Forested Wetland	< 19	19 -< 26	26 -< 37	37 -< 50	50 -< 100
	Tall Heath	< 17	17 -< 23	23 -< 33	33 -< 46	46 -< 100
	Short Heath	< 12	12 -< 16	16 -< 24	24 -< 34	34 -< 100
	Arid-Shrublands (acacia and chenopod)	< 8	8 -< 11	11 -< 17	17 -< 24	24 -< 100
	Freshwater Wetlands	< 7	7 -< 10	10 -< 15	15 -< 21	21 -< 100
	Alpine Complex	< 8	8 -< 11	11 -< 17	17 -< 24	24 -< 100
	Grassland	< 13	NOT APPLICABLE			13 -< 50

8. Access

PBP 2018 requires that the design of access roads enables safe access and egress for people attempting to leave the area at the same time that emergency service personnel are arriving to undertake firefighting operations.

Access to the site is via Meatworks Avenue. Meatworks Avenue is a two-way sealed existing road that services the site. A private road provides entry to the site which will comply with Planning for Bushfire Protection 2018.

Given the location of the site, an alternative access is not provided. The adjoining land are undeveloped and do not provide for a secondary access to be provided. A secondary access would be into areas of thicker vegetation and is considered to increase risk to users in the event of a bushfire.

PBP 2018 (p. 84) requires that a new development is to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.

PBP 2018 does not require a secondary access for industrial development. Rather, PBP 2018 (p. 87) requires that:

A suitable package of BPMs should be proposed commensurate with the assessed level of risk to the development. The scale of the development and numbers of people likely to be occupying the building will be directly relevant to the BPMs proposed.

The site is serviced by a 6.5m internal road network including the connection to Meatworks Ave. The Stage 1 works include provision of a perimeter road. The Stage 2 work has a ramp leading to the underground car parking. Fire appliances will not access the underground car parking and will operate from the existing road network.

An increased emphasis has been placed on providing access within the site for emergency services and a detailed Bushfire Emergency Management and Evacuation Plan.

9. Water Supply and Utilities

PBP 2018 (p. 47) requires that adequate services of water for the protection of buildings during and after the passage of a bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

Detailed water and service design will be provided for CC after the DA is approved.

Water and services will comply with PBP 2018 such that fire hydrant spacing, design and sizing comply with the Australian Standard AS 2419.1:2005, and hydrants are not located within any road carriageway.

10. Emergency Management Arrangements

Emergency management arrangements will be demonstrated through a separate Bushfire Emergency Management and Evacuation Plan which will be provided prior to occupation that will include triggers for closing the site and what to do in the event of a bushfire emergency.

11. Assessment Against the Aim and Objective of PBP

All development in Bushfire Prone Areas needs to comply with the aim and objectives of PBP. Table 4 shows the compliance with PBP.

Table 4 Compliance with Aim & Objectives of PBP

Aim	Meets Criteria	Comment
The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and the protection of the environment.	Yes	Landscaping, defensible space, access and egress, emergency risk management and construction standards are in accordance with the requirements of PBP and the aims of PBP have been achieved.
Objectives	Meets Criteria	Comment
Afford occupants of any building adequate protection from exposure to a bushfire.	Yes	The development provides opportunity for all occupants to be shielded from any external bushfire.
Provide for defensible space to be located around buildings.	Yes	Defensible space is provided on all sides of the proposed development.
Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent direct flame contact and material ignition.	Yes	The structures are separated from unmanaged vegetation by APZs. Buildings will be built to BAL 40.
Ensure that safe operational access and egress for emergency service personnel and occupants is available.	Yes	The site has direct access to public roads, and access and egress for emergency vehicles and evacuation is adequate. A perimeter road is provided around the buildings for Stage 1. The development provides for the movement of fire appliances about the site with passing areas provided for fire trucks if needed.
Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads, in the asset protection zone.	Yes	The Stage 2 works will be managed as an APZ as per Figure 6 and will be maintained to Inner Protection Zone standards. Most of the site is hardstand concrete paved areas.
Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting).	Yes	Utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting).

12. Recommendations

The following recommendations are made for the Stage 2 50 Meatworks Ave, Oxford Falls:

1. **Asset Protection Zones:** At the commencement of building works and in perpetuity, an Asset Protection Zone shall be established and maintained as per Figure 6 to the boundary of the site to the south or 18m to the east and south of the Stage 2 buildings. A 22m APZ to the west. The APZ shall be established and maintained as an inner protection area as outlined within *Planning for Bushfire Protection 2018* and the NSW RFS document '*Standards for Asset Protection Zones*'.
2. **Fire hydrants** to be provided in accordance with Building Code of Australia E1.3, AS2419.1:2005.
3. **Construction Standards** the Stage 2 Building shall be constructed to BAL Flame Zone for the south western portion and BAL 40 for the south eastern portion of the building in accordance with Australian Standard for Construction of Buildings in Bushfire Prone Areas. The northern elevation shall be constructed to BAL 40.

13. Conclusion

The Bushfire Hazard Assessment to support a Development Application (DA) for a proposed expansion of the approved Stage 1 industrial development at 100 Meatworks Ave, Oxford Falls.

The site is surrounded bushfire prone land. Commercial and industrial development is designated as "other" development in PBP 2018. As "other" development, the proposed development has considerable flexibility and the nature of the development often results in the structures providing a higher degree of bushfire resistance that required by the NSW Rural Fire Service.

The proposed new building and the site is able to respond and implement an appropriate level of bushfire protection measures, as per *Planning for Bushfire Protection 2018*.

This Report is a Bush Fire Hazard Assessment that provides the required information to assist Council in determining compliance in accordance with the aims and objectives of *Planning for Bushfire Protection 2018*.



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