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Bushfire Protection Assessment

Budawang School redevelopment

School Infrastructure NSW

DOCUMENT TRACKING

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Project Manager	Natalie South
Prepared by	Natalie South
Reviewed by	Rod Rose
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LIMITATIONS

The bushfire protection measures recommended in this report do not completely remove the risk to life and property, and they do not guarantee that a development will not be impacted by a bushfire event. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.

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Contents

1. Property and proposal	1
1.1 Description of proposal	1
1.2 Assessment process	1
1.3 Significant environmental features	2
1.4 Aboriginal cultural heritage	2
2. Bushfire hazard assessment	4
2.1 Process	4
2.2 Vegetation assessment	4
2.3 Slope assessment	4
2.4 Summary of assessment	4
3. Bushfire protection measures	6
3.1 Asset Protection Zones	6
3.2 Landscaping	7
3.3 Construction standards	7
3.3.1 Construction requirements	7
3.3.2 Additional construction requirements	7
3.3.3 Fences and gates	7
3.4 Access	7
3.5 Water supplies	8
3.6 Electricity services	8
3.7 Gas services	9
4. Emergency and Evacuation Planning	9
5. Conclusion	11
6. Recommendations	12
7. References	13
Appendix A - Asset protection zone and landscaping standards	14
Appendix B - Access Standards	15

List of Figures

Figure 1: Site plan.....	3
Figure 2: Bushfire hazard assessment.....	5

List of Tables

Table 1: Subject site and development proposal summary.....	1
Table 2: Summary of Bush Fire Protection Measures assessed.....	2
Table 3: Bushfire hazard assessment, APZ requirements and BALs	4
Table 4: APZ requirements and compliance (adapted from Table 6.8a of PBP)	6
Table 5: Landscaping requirements and compliance (adopted from table 6.8a of PBP).....	7
Table 6: Summary of compliance with PBP Acceptable Solutions for Access.....	8
Table 7: Water supply requirements (adapted from Table 6.8c of PBP)	8
Table 8: Assessment of requirements for the supply of Electricity services (adapted from Table 6.8c of PBP)	8
Table 9: Assessment of requirements for the supply of gas services (adapted from Table 6.8c of PBP) ..	9
Table 10: Assessment of emergency requirements (adapted from Table 6.8d of PBP)	9
Table 11: Development Bushfire Protection Solutions and Recommendations.....	11
Table 12: APZ management specifications	14
Table 13: General SFPP access requirements (adapted from Table 6.8b of PBP).....	15
Table 14: Perimeter road requirements (adapted from Table 6.8b of PBP)	16
Table 15: Non-perimeter road requirements (adapted from Table 6.8b of PBP)	16

Abbreviations

Abbreviation	Description
AS 3959	Australian Standard 3959-2018 'Construction of buildings in bushfire-prone areas'
APZ	Asset protection zone
BAL	Bushfire Attack Level
BFPL	Bush fire prone land
DA	Development application
EP&A Act	Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
IPA	Inner protection area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
OPA	Outer protection area
PBP	'Planning for Bush fire Protection 2019'
RFS	NSW Rural Fire Service
SFPP	Special Fire Protection Purpose

1. Property and proposal

Table 1 identifies the subject property and outlines the type of development proposed.

Table 1: Subject site and development proposal summary

Street address:	17 Croobyar Road, Milton
Postcode:	2539
Lot/DP no:	Part of Lot 200 DP 1192140
Local Government Area:	Shoalhaven City Council
Fire Danger Index (FDI)	100
Current land zoning:	R1 General Residential
Type of development proposed:	Special Fire Protection Purpose (SFPP)

1.1 Description of proposal

The proposal is for redevelopment within the previously occupied Budawang School premises. The proposed development site is within a 400 m² vacant parcel within the north of the existing school as shown in **Figure 1** (hereafter known as the 'subject land').

The proposed development consists of seven (7) homebases, two (2) classroom blocks, hydro pool, play area and associated carparking and infrastructure.

The subject land itself is not on land mapped as bush fire prone by Shoalhaven City Council's (Council) Bush Fire Prone Land (BFPL) map¹ however the far south-east corner of 17 Croobyar Road, Milton is affected by Category 2 vegetation buffer.

1.2 Assessment process

Being a Special Fire Protection Purpose (SFPP) development, the development proposal was assessed in accordance with Section 100B of the *Rural Fires Act 1997* and *Planning for Bush Fire Protection* (RFS 2019), herein referred to as PBP.

This assessment is based on the following information sources:

- Background documentation provided by Group GSA;
- Information contained within the site plan from Group GSA (Project No. 190941, **Figure 1**); and
- GIS analysis including online spatial resources (i.e. Google Earth, SIX Maps, Nearmap and the NSW Government Planning Portal); and
- Site inspection undertaken 15 October 2020.

Table 2 identifies the Bush Fire Protection Measures assessed and whether an Acceptable or Performance Solution is being proposed.

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

Table 2: Summary of Bush Fire Protection Measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.1
Landscaping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Water supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Electrical services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.6
Gas services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.7
Emergency management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

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 Bush Fire 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. Asset Protection Zone (APZ)) is identified within this report and therefore capable of being assessed by suitably qualified persons. The Minister for Planning is the determining authority 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 Bush Fire Protection Measures has not been undertaken in this report as it is covered by other parts of the DA process.

The impact footprint of the bushfire protection measures (e.g. APZ) is identified within this report and therefore capable of being assessed by suitably qualified persons. The Minister for Planning is the determining authority for this development; they will assess more thoroughly any potential Aboriginal cultural heritage issues.

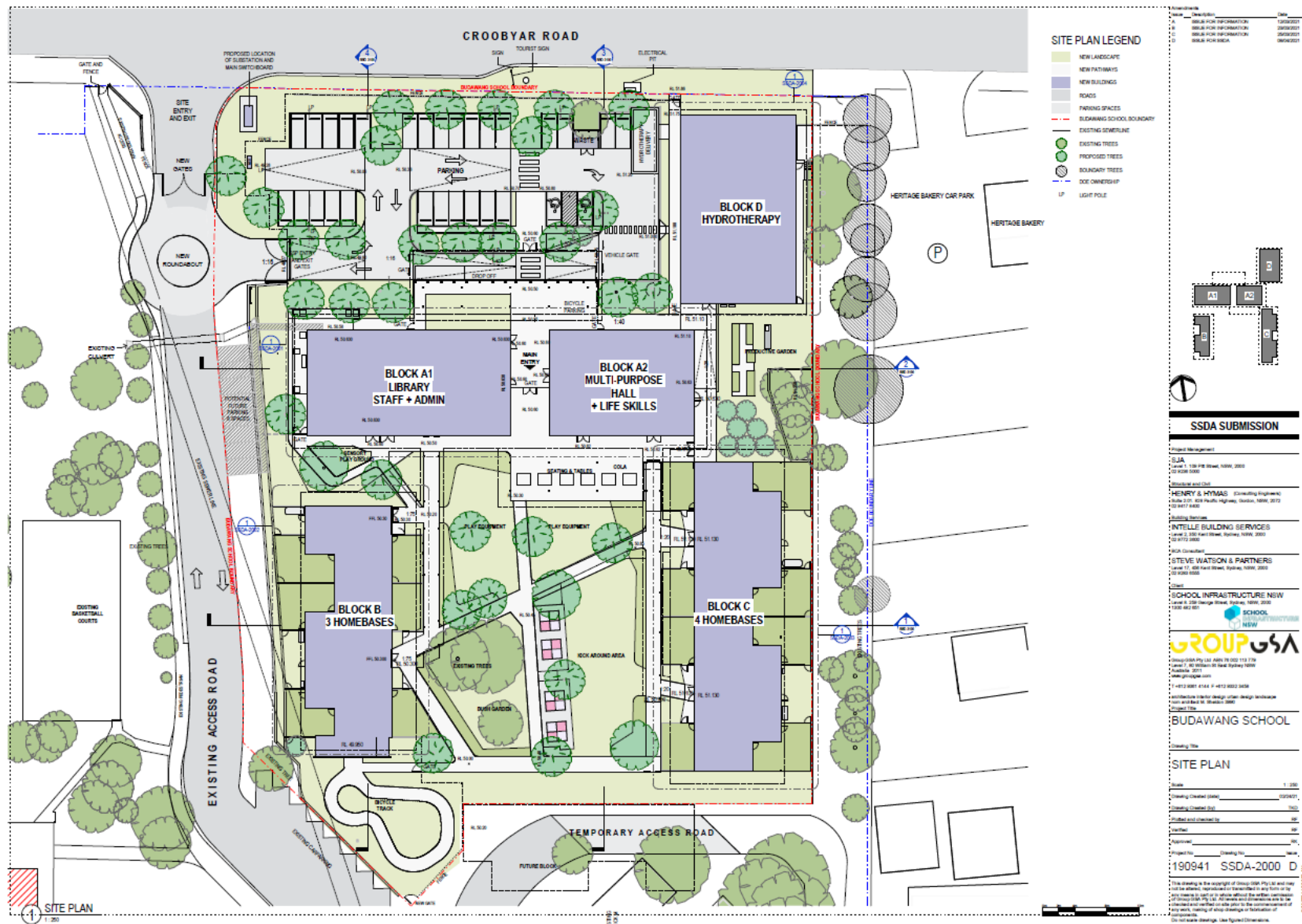


Figure 1: Site plan

2. Bushfire hazard assessment

2.1 Process

The site assessment methodology from Appendix 1 of PBP has been used in this assessment to determine the required APZ and Bushfire Attack Level (BAL) construction requirements.

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

2.2 Vegetation assessment

In accordance with PBP, the predominant vegetation 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 site inspection.

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 and confirmed from site assessment.

2.4 Summary of assessment

As shown in **Figure 2** the predominant vegetation affecting the proposed development is within the riparian corridor to the west. This vegetation is not mapped as bush fire prone however is capable of supporting bushfire. The riparian corridor is approximately 15m-50 m wide and contains a mix of exotic (water lily, common reeds) and native species (*casuarinas*, *acacia* and *eucalyptus*). The vegetation has been classified as 'low hazard' vegetation in accordance with Section A1.11.1 of PBP. Low hazard vegetation uses 'rainforest' setbacks and construction levels as a surrogate for the reduced fire behaviour expected from small and/or narrow areas of vegetation. The effective slope under this vegetation falls under the PBP slope category of '>0-5 degrees downslope'.

Table 3: Bushfire hazard assessment, APZ requirements and BALs

Transect #	Slope	Vegetation Formation	Required APZ	Proposed APZ	Bushfire Attack Level (BAL)	Comments
1 (West)	>0° to 5° downslope	Low hazard (Rainforest)	47 m	47 m	BAL-12.5	APZ provided by roads and managed land within Budawang School grounds. Where APZ overlaps the low hazard vegetation footprint (see Figure 2) the vegetation will be managed to APZ standards as per Appendix A.
All other directions				Managed land		

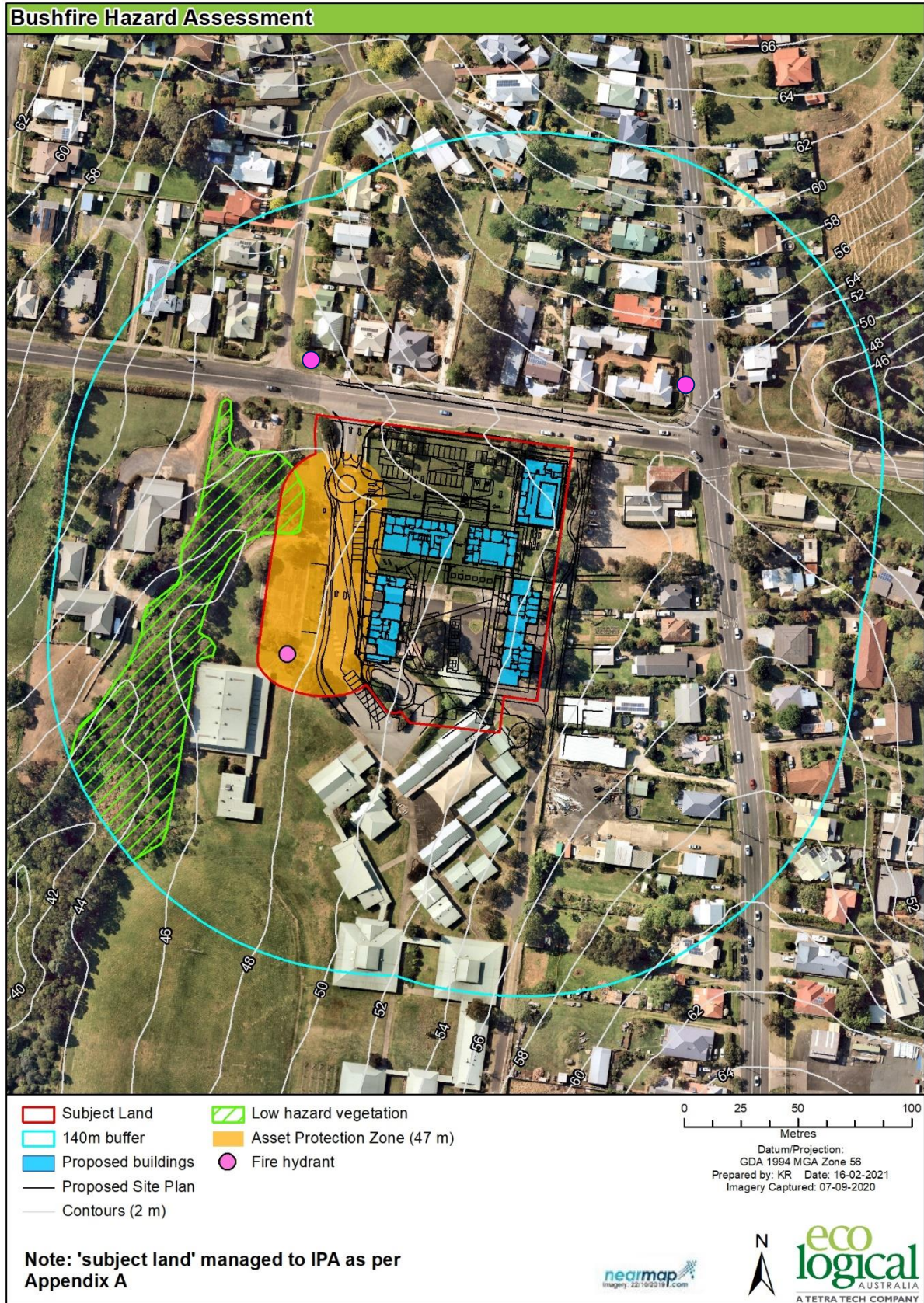


Figure 2: Bushfire hazard assessment

3. Bushfire protection measures

3.1 Asset Protection Zones

Table 3 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 2**.

The compliance of the proposed APZ with Section 6.8.1 of PBP is provided in **Table 4**.

Table 4: APZ requirements and compliance (adapted from Table 6.8a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Radiant heat levels of greater than 10kW/m ² (calculated at 1200K) will not experienced on any part of the building	The building is provided with an APZ in accordance with table A1.12.1 in Appendix 1.	Complies APZ provided in accordance with Table A1.12.1 as shown in Table 3 and Figure 2 .
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	The APZ is located on lands with a slope less than 18 degrees.	Complies APZ is not located on slopes greater than 18°.
APZs are managed and maintained to prevent the spread of fire to the building.	The APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site;	Can comply APZ to be managed in accordance with PBP. Fuel management specifications provided in Appendix A.
	APZs are wholly within the boundaries of the development site; and	Complies with Performance Criteria APZ located within Budawang School grounds, which the development site forms part.
The APZ is provided in perpetuity.	Other structures located within the APZ need to be located further than 6m from the refuge building.	Complies No buildings located within 6 m of the proposed development.

3.2 Landscaping

The compliance of the proposed landscaping with Section 6.8.1 of PBP is provided in **Table 5**.

Table 5: Landscaping requirements and compliance (adopted from table 6.8a 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.	Landscaping is in accordance with Appendix 4 of PBP; and	Can comply APZ / Landscaping is to be managed in accordance with PBP. Landscaping specifications provided in Appendix A .
	Fencing is constructed in accordance with Section 7.6 of PBP.	Fencing to be constructed in accordance with Section 7.6 of PBP.

3.3 Construction standards

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.

The proposed development is exposed to **BAL-12.5** as identified in **Table 3**.

3.3.1 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 and Section 5 (BAL-12.5) of AS 3959:2018 (SA 2018) or NASH Standard 1.7.14 (NASH 2014) as appropriate.

3.3.2 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.

3.3.3 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, they should be made of non-combustible material only.

3.4 Access

Public road access to the development is via an existing entry point off Croobyar Road in the north (**Figure 1**).

Figure 1 and **Figure 2** show the access within the development, the performance criteria and Acceptable Solutions are shown in **Table 13-Table 15 (Appendix B)**, along with comment on the design compliance or otherwise.

A summary of compliance with PBP Acceptable Solutions for access is provided in **Table 6**.

Table 6: Summary of compliance with PBP Acceptable Solutions for Access

Access type	Compliance with Acceptable Solutions	Details
General	Can comply with all Acceptable Solutions	Table 12
Perimeter road	Can comply with all Acceptable Solutions	Table 13
Non-perimeter road	Can comply with all Acceptable Solutions	Table 14
Property Access	Not applicable	N/A

3.5 Water supplies

Assessment of compliance of the proposed water supply with Section 6.8.3 of PBP is shown in **Table 7**.

Table 7: Water supply requirements (adapted from Table 6.8c 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; or A 10,000 litres minimum static water supply dedicated for firefighting purposes is provided for each occupied building where no reticulated water is available.	Complies Proposal serviced by a reticulated water supply, refer Figure 2.
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.	Complies Existing reticulated water supply.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1 (SA 2005).	Complies Existing reticulated water supply
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.	Can comply Not applicable

3.6 Electricity services

Assessment of compliance of the proposed supply of electricity services with Section 6.8.3 of PBP is shown in **Table 8**.

Table 8: Assessment of requirements for the supply of Electricity services (adapted from Table 6.8c 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:	Complies Electricity services to the site are aboveground however will be underground to the proposed development. Can comply

Performance Criteria	Acceptable Solution	Compliance Notes
	<p>Lines are installed with short pole spacing (30 m), unless crossing gullies, gorges or riparian areas; and</p> <p>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).</p>	

3.7 Gas services

Assessment of compliance of the proposed supply of gas services (reticulated or bottle gas) with Section 6.8.3 of PBP is shown in **Table 9**.

Table 9: Assessment of requirements for the supply of gas services (adapted from Table 6.8c 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.	<p>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;</p> <p>All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 m and shielded on the hazard side;</p> <p>Connections to and from gas cylinders are metal;</p> <p>Polymer-sheathed flexible gas supply lines are not used; and</p> <p>Above-ground gas service pipes are metal, including and up to any outlets.</p>	<p>Can comply</p> <p>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 6.8c of PBP.</p>

4. Emergency and Evacuation Planning

Assessment of compliance of the proposed emergency and evacuation planning with Section 6.8.4 of PBP is shown in **Table 10**.

Table 10: Assessment of emergency requirements (adopted from Table 6.8d of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
A bushfire emergency and evacuation management plan is prepared	<p>Bush fire emergency management and evacuation plan is prepared consistent with the:</p> <ul style="list-style-type: none"> • The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; <ul style="list-style-type: none"> ○ NSW RFS Schools Program guide; ○ Australian Standard AS 3745:2010 Planning for emergencies in facilities; and ○ Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities. 	Can comply

Performance Criteria	Acceptable Solutions	Compliance Notes
	<ul style="list-style-type: none"> The bushfire emergency and evacuation management plan should include a mechanism for the early relocation of occupants. <p>Note: A copy of the bush fire emergency management plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.</p>	
Appropriate and adequate management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan.	<ul style="list-style-type: none"> An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual; and Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745:2010 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted. 	<p>Can comply</p> <p>Can comply</p>

5. Conclusion

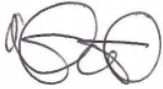
The proposed Special Fire Protection Purpose (SFPP) development has been assessed as compliant with the specifications and requirements under the Acceptable Solutions within 'Planning for Bush Fire Protection 2019', as outlined in **Table 11** below.

Table 11: Development Bushfire Protection Solutions and Recommendations

Bushfire Protection Measures	Recommendations	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	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 .	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.1
Landscaping	Any future landscaping meets the requirements of PBP listed in Appendix A .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	The proposed development is to be constructed to BAL-12.5 based on the construction specifications detailed in either AS 3959-2018 or the NASH standard, including additional ember provisions detailed in section 7.5 of PBP as required.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	Access to meet standards summarised in Table 6 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Water supply	Reticulated water supply to meet PBP acceptable solution specifications for a subdivision.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Electricity service	Electricity supply located underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.6
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.7
Emergency Management	Bushfire emergency Management and Evacuation Plan to be completed prior to occupation of the building.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

6. Recommendations

It is recommended that the proposed development be approved with consent conditions based on the findings in **Table 11**.



Natalie South
Bushfire Consultant



Rod Rose
Senior Principal - Bushfire
FPAA BPAD Accredited Practitioner No. BPAD1940-L3



7. References

Industry Safety Steering Committee 3 (ISSC3). 2016. *ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets*. November 2016. NSW.

National Association of Steel Framed Housing (NASH). 2014. *Steel Framed Construction in Bush Fire Prone Areas*. NASH

NSW Rural Fire Service (RFS). 2014. *Publication: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* (RFS 2014).

NSW Rural Fire Service (RFS). 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* - issued December 2019. Australian Government Publishing Service, Canberra.

Standards Australia (SA). 2005. *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, SAI Global, Sydney.

Standards Australia (SA). 2010. *Planning for emergencies in facilities*, AS 3745:2010, SAI Global, Sydney.

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 APZ management specified in **Table 12** applies to the entire site aside from the riparian area and are to be maintained in perpetuity with the maintenance undertaken at least once per year and prior to the commencement of the Bush Fire Danger Period.

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

Table 12: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)
Trees	<p>Tree canopy cover should be less than 15% at maturity;</p> <p>Trees (at maturity) should not touch or overhang the building;</p> <p>Lower limbs should be removed up to a height of 2 m above ground;</p> <p>Canopies should be separated by 2 to 5 m; and</p> <p>Preference should be given to smooth barked and evergreen trees.</p>
Shrubs	<p>Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;</p> <p>Shrubs should not be located under trees;</p> <p>Shrubs should not form more than 10% ground cover; and</p> <p>Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.</p>
Grass	<p>Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and</p> <p>Leaves and vegetation debris should be removed.</p>

APZ management within riparian area.

The following management specifications apply to the APZ impacting the riparian shown in Figure 2:

- Dead vegetation, exotic trees (if any), saplings and weeds will be removed (none have hollows);
- Grass will be mown and maintained to <100 mm height;
- Reeds will be slashed and maintained to <100 mm height (annual slashing to be done in early;
- Summer; after potential bird breeding and before bushfire season).

Appendix B - Access Standards

Table 13: General SFPP access requirements (adapted from Table 6.8b 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.	SFPP access roads are two-wheel drive, all-weather roads;	Complies The development will provide bitumen sealed roads.
	Access is provided to all structures;	Complies Access to all structures is provided by existing road network within school and proposed roads/carparking as shown in Figure 1.
	Traffic management devices are constructed to not prohibit access by emergency services vehicles;	Can comply Detail not provided at this stage.
	access roads must provide suitable turning areas in accordance with Appendix 3; and	Complies All roads are either through roads or provide turning areas compliant with Appendix 3 (Figure 1).
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these to ensure accessibility to reticulated water for fire suppression.	Complies Concept in Figure 1 shows one way public road (drop off zone) within carpark is approximately 4 m wide.
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.	Can comply Detail not provided at this stage.
There is appropriate access to water supply	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;	Can comply Detail not provided at this stage.
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2017 – Fire hydrant installations system design, installation and commissioning; and	Can comply Detail not provided at this stage.
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Not applicable

Table 14: Perimeter road requirements (adapted from Table 6.8b of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Are two-way sealed roads;	Complies Existing perimeter road within Budawang School is a two-way sealed road.
	Minimum 8m carriageway width kerb to kerb;	Complies Existing perimeter road within Budawang School is 8 m kerb to kerb.
	Parking provided outside of the carriageway width;	Complies Designated parking provided within carparking areas.
	Hydrants are located clear of parking areas;	Can comply Detail not provided at this stage.
	There are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	Complies As shown in Figure 1, proposed road within the development is a loop road connecting with broader road network <500 m.
	Curves of roads have a minimum inner radius of 6m;	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 5.3b of PBP.
	The maximum grade road is 15 degrees and average grade is 10 degrees;	
	The road crossfall does not exceed 3 degrees;	
	A minimum vertical cleared of 4m to any overhanging obstructions, including tree branches, is provided.	

Table 15: Non-perimeter road requirements (adapted from Table 6.8b of PBP)

Performance Criteria	Acceptable Solutions	Compliance notes
The intent may be achieved where:		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5m width kerb to kerb;	Complies Concept in Figure 1 shows non-perimeter roads minimum 6 m wide.
	Parking is provided outside of the carriageway width;	Complies Designated parking provided within carparking areas.
	Hydrants are located clear of parking areas;	Can comply Detail not provided at this stage.
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	Complies As shown in Figure 1, proposed road within the development is a

Performance Criteria	Acceptable Solutions	Compliance notes
		loop road connecting with broader road network <500 m.
	Curves of roads have a minimum inner radius of 6m	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 5.3b of PBP.
	The road crossfall does not exceed 3 degrees;	
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	

