New High School in Jerrabomberra - Bushfire Protection Assessment

NSW Department of Education

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DOCUMENT TRACKING

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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.

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from School Infrastructure NSW.

Template 2.8.1

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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
PBP	'Planning for Bush fire Protection 2019'
RFS	NSW Rural Fire Service
SFPP	Special Fire Protection Purpose

1. Introduction

This Bushfire Protection Assessment accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in support of an application for a State Significant Development (SSD No 24461956). The SSDA is for a new high school located at Jerrabomberra.

This report addresses the Secretary's Environmental Assessment Requirements (SEARs), notably:

Table 1: SEARs Requirement

SEARs Item	SEARs Requirement	Response
20	Provide a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with Planning for Bushfire Protection (NSW RFS, 2019).	Section 1.4 of this report details the assessment process and summarises the bushfire protection measures assessed.

1.1 Proposal

The below description was provided by the client for the purpose of this report.

The proposed development is for the construction of a new high school in Jerrabomberra. The proposal will meet community demand and to ensure new learning facilities are co-located near existing open space infrastructure. The proposal generally includes the following works:

- Site preparation
- Construction of a series of buildings up to three storeys including administration/staff areas, library, hall and general learning spaces
- Construction of new walkways, central plaza and outdoor games courts
- Construction of a new at-grade car park
- Associated site landscaping and open space.

The proposal has been designed to accommodate approximately 500 students with Stream 3 teaching spaces, however the core facilities will be future proofed to a Stream 5 to enable possible future expansion to meet projected demand.

The proposal will include site preparation works, such as clearing and levelling to accommodate the proposed buildings and play areas. The proposal will involve the construction of a series of buildings housing general learning spaces, administration and staff wings, outdoor learning areas, a library and assembly hall.

The proposal will include construction of a new driveway and hardstand with access proposed off the northern stub road east of Environa Drive. Pedestrian access is proposed off Environa Drive and the northern stub road.

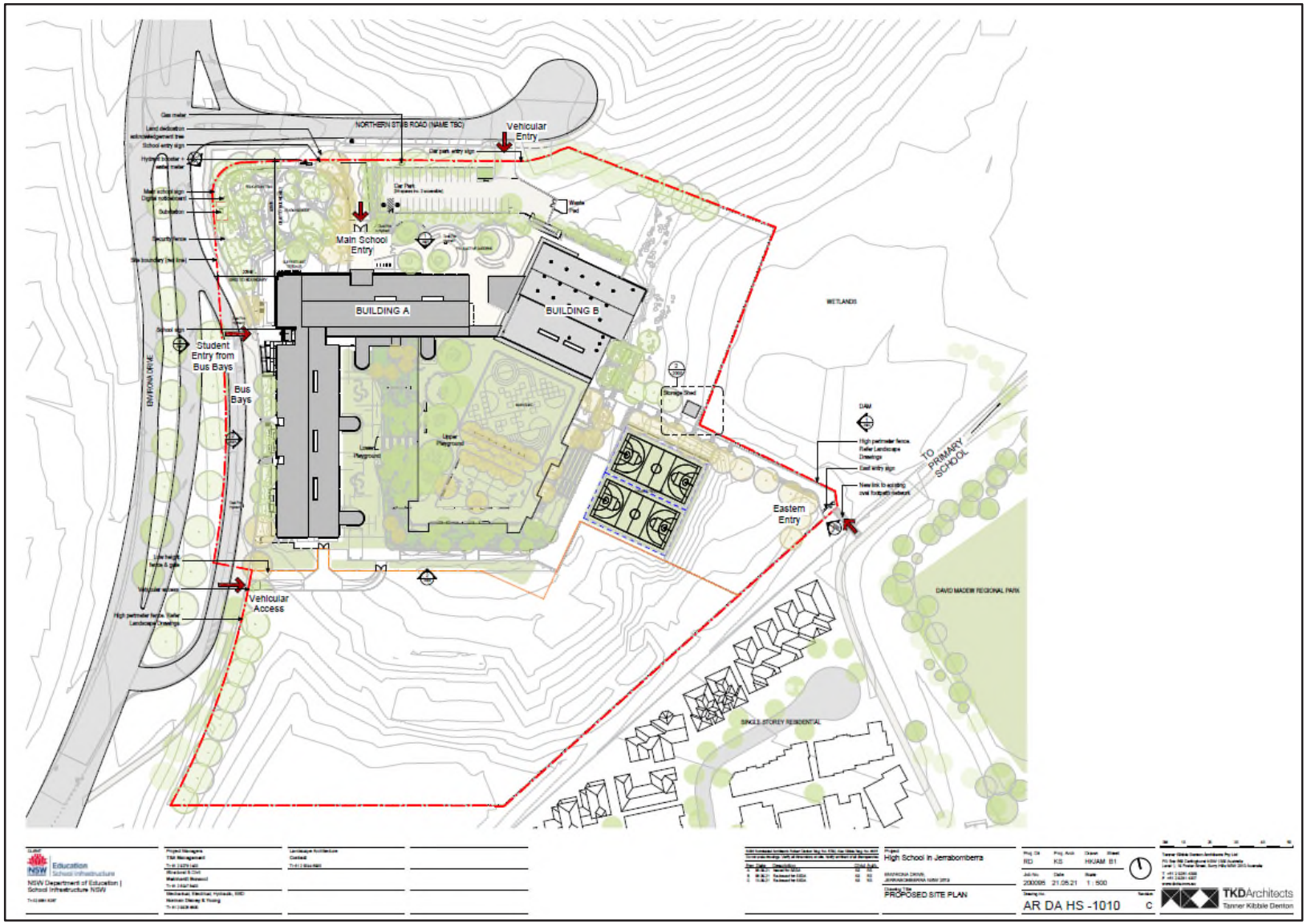

Figure 1: Site plan (Source: TKD Architects)

1.2 Site Description

This site description has been provided by the client for the purpose of this report.

The proposed development is located within the South Jerrabomberra Innovation Precinct, also referred as the Poplars Innovation Hub, in the local government area of Queanbeyan-Palerang Regional Council.

The school site- is part of an existing lot (Lot 1 in DP 1263364), which is approximately 65.49 ha in area and will be characterised by a mix of business park and open space uses and a new north-south connector road named Environa Drive.

Delivery of the Precinct is underway with Environa Drive currently under construction. Most of the lot, however, remains undeveloped.

The school site is subject to a proposed lot (Lot 2 in DP 1263364), which was approved by Council under DA332-2015 on 10 March 2021 but is not yet registered. The approved lot is irregular in shape, is largely cleared and is approximately 4.5 ha in area. A small dam is located adjacent to the south eastern boundary of the site, which forms part of a broader wetland.

The site is located in excellent proximity to existing open space facilities. It adjoins David Madew Regional Park to the south east and is located 100 m east of an existing recreational field associated with Jerrabomberra Public School.

A description of the site is provided in the table below.

Table 2: New High School in Jerrabomberra Site Description

Item	Description
Site address	School address yet to be determined however, it is located within the Jerrabomberra Innovation Precinct at 300 Lanyon Drive, Jerrabomberra.
Legal description	Lot 1 in DP 1263364 (existing) Lot 2 in DP 1263364 (proposed, but not registered)
Total area	Lot 1 – 65.49ha Lot 2 – 4.5ha
Frontages	The site provides frontage to Environa Drive and the northern stub road, both currently under construction.
Existing use	The site is undeveloped and contains a series of small vegetation clusters scattered across the site.
Existing access	Existing access is via an informal unsealed driveway off Tompsitt Drive along the northern boundary of the existing lot. The site will be accessed via Environa Drive and a secondary access road (North Road), which is currently under construction.
Context	Land to the south is primarily residential in nature. Jerrabomberra Public School and David Madew Regional Park are located to the east/south-east, while land to the west is undeveloped and features Jerrabomberra Creek. The site is located within the South Jerrabomberra Innovation Precinct, which is currently under construction. The areas north and west of the site are currently undeveloped but the site is currently undergoing a transition from rural to business park uses.

Development further north on the opposite side of Tompsitt Drive and along Edwin Land Parkway includes retail and commercial uses.

Development immediately to the south includes existing low density residential development. Land in the south west has been identified for future low density residential, light industrial and business park uses.

Figure 2: Site aerial depicting the land subject to the proposed High School (Source: TKD Architects)

1.3 Assessment Process

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

Table 3: Subject site and development proposal summary

Street address:	Environa Drive, Jerrabomberra / 300 Lanyon Drive, Jerrabomberra
Postcode:	2619
Lot/DP no:	Lot 1 DP 1263364 (existing) Lot 2 in DP 1263364 (proposed, but not registered)
Local Government Area:	Queanbeyan-Palerang Regional Council
Fire Danger Index (FDI)	100
Current land zoning:	RE2 Private Recreation
Type of development proposed:	Special Fire Protection Purpose (SFPP)

The proposal seeks development approval for a high school which is classified as Special Fire Protection Purpose (SFPP) development. The preliminary concept is shown in Figure 1. The proposed development consists of two (2) buildings with lower ground, ground and level 1 floors comprising of various classrooms and associated school infrastructure.

The subject land itself is within the vegetation buffer of Bushfire Prone Land as per the NSW Government Planning Portal Bush Fire Prone Land (BFPL) map[1].

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 TSA Management;
- Information contained within the site plan from TKD Architects (Job No. 200095, Rev C, 13 September 2021, Figure 1); and
- GIS analysis including online spatial resources (i.e. Google Earth, SIX Maps, Nearmap and the NSW Government Planning Portal).

Table 4 identifies the Bushfire 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 4: Summary of Bushfire Protection Measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	☑	☑	3.1
Landscaping	☑	☐	3.2
Construction standard	☑	☐	3.3
Access	☑	☐	3.4
Water supply	☑	☐	0
Electrical services	☑	☐	3.6
Gas services	☑	☐	0
Emergency management	☑	☐	3.9

1.4 Significant environmental features

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

The impact footprint of the bushfire protection measures (e.g., Asset Protection Zone [APZ]) is identified within this report and therefore capable of being assessed by a suitably qualified person. The Minister for Planning is the determining authority for this development; they will assess more thoroughly any potential environmental issues.

1.5 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 identified within this report and therefore capable of being assessed by a suitably qualified person. The Minister for Planning is the determining authority for this development; they will assess more thoroughly any potential Aboriginal cultural heritage issues.

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 3 and Table 5 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 desktop assessment and previous assessment works (ELA 2020).

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 proposed school site is bounded by rural lands to the south-west to the east. There is strong evidence of historical grazing across this land however this land is conservatively assessed as a bushfire hazard and is classified as 'grassland' in accordance with PBP (Figure 3).

As shown in Figure 3**,** the area west of the subject land forms part of the Environa Drive infrastructure and is not considered a bushfire hazard.

The effective slope under the bushfire hazard adjoining the subject land range between 'all upslopes and flat land' and '>5-10 degrees downslope' where the topography falls to Jerrabomberra Creek to the west.

Table 5: Bushfire hazard assessment, APZ requirements and BALs

Transect #	Direction	Slope	Vegetation Formation	SFPP Required APZ	Proposed APZ	Comments
1	North-east	All upslope and flat land	Grassland	36 m	≥36 m	APZ provided within subject land.
2	East	>0° to 5° downslope	Grassland	40 m	≥40 m	APZ provided within subject land.
3	North-west	>5° to 10° downslope	Grassland	45 m	≥45 m	APZ provided within subject land and public road infrastructure as part of Environa Drive.
	All other directions	Managed lands.				

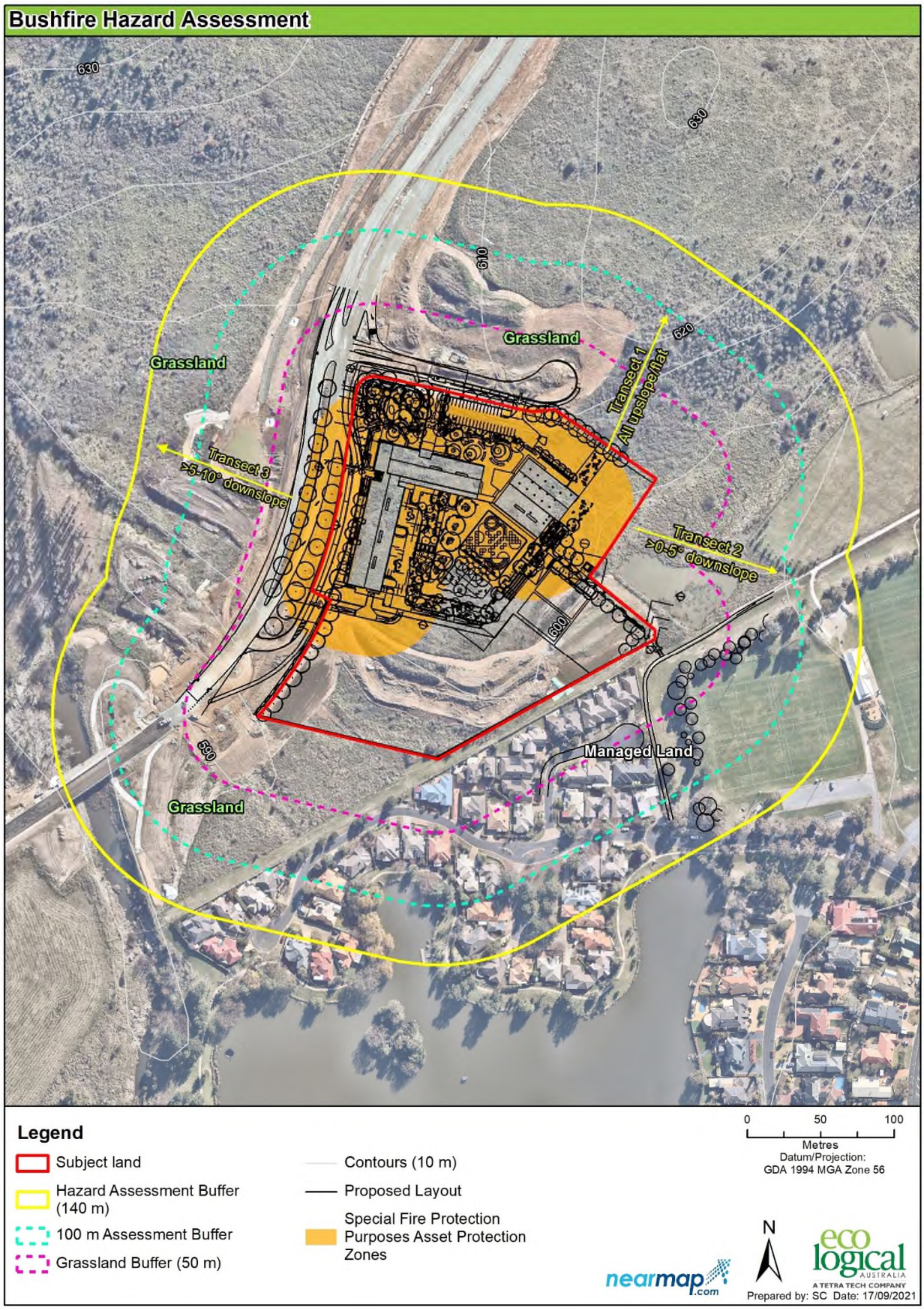

Figure 3: Bushfire hazard assessment

3. Bushfire protection measures

3.1 Asset Protection Zones

Table 5 shows the dimensions of the required APZ and where relevant, information on how the APZ is to be provided is included. The footprint of the APZ is also shown on Figure 3.

The compliance of the proposed APZ with Section 6.8.1 of PBP is provided in Table 6.

Table 6: 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/m² (calculated at 1200K) will not be 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 5 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;	**To 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** APZ complies with performance criterion, majority of APZ provided within subject land boundary and by public road infrastructure in the west and north-west.
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 7.

Table 7: 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	**To 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.	**To comply** Fencing to be constructed in accordance with Section 7.6 of PBP (see Section 3.3.3 for further details).

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 5.

3.3.1 Construction requirements

The Deemed to Satisfy (DtS) provisions of the National Construction Code (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 Environa Drive to the west and proposed 'Eastern Entry' in the south-east.

Figure 1 and Figure 2 show the internal and perimeter access within the development. The performance criteria and acceptable solutions for each of these access types are shown in Table 16: General SFPP access requirements (adapted from Table 6.8b of PBP)Table 16, Table 17 and Table 18 (Appendix B), along with comment on the design compliance or otherwise.

A summary of the compliance assessment with PBP can be found in Table 8 below whilst all access performance solutions are detailed in Table 9.

Table 8: Access summary of compliance

Access type	Acceptable Solution	Performance Solution	Further details
General	☑	☐	Table 9 and Table 16
Perimeter road	☑	☑	Table 9 and Table 17
Non-perimeter road	☑	☑	Table 9 and Table 18
Property Access	N/A	**N/A**	**N/A**

Table 9: Access performance solution

Access Type	Acceptable solution	Performance criterion / criteria	Comments
Perimeter / Non-perimeter	There are through roads, and these are linked to the internal road system at an internal of no greater than 500m;	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.	The Northern Stub Road is a dead-end road however performance criteria is met by being fully compliant with PBP road dimensions and complaint turning circle allowing safe access/egress and less than 500 m in length. This road is also likely to be extended when future development occurs.

3.5 Water supplies

Assessment of compliance of the proposed water supply with Section 6.8.3 of PBP is shown in Table 10.

Table 10: 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.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1 (SA 2005); Hydrants are not located within any road carriageway; and Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	**Can comply** The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and table 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 Above-ground water storage tanks shall be of concrete or metal.	

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 11.

Table 11: 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;	**Complies** Electricity services to the subject site are located 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).	**Not applicable**

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 12.

Table 12: 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.	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.	**Can comply** The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and table 5.3c of PBP.

3.8 Staged development

The proposed development will not be staged.

3.9 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 13.

Table 13: 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	Bush fire emergency management and evacuation plan is prepared consistent with the: • The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; o NSW RFS Schools Program guide; o Australian Standard AS 3745:2010 Planning for emergencies in facilities; and o Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities. • The bushfire emergency and evacuation management plan should include a mechanism for the early relocation of occupants. 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.	**Can comply**

Performance Criteria	Acceptable Solutions	Compliance Notes
Appropriate and adequate management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan.	• 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	**Can comply**
	• 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.	**Can comply**

4. Conclusion

The proposed Special Fire Protection Purpose (SFPP) development has been assessed against 'Planning for Bush Fire Protection 2019', as outlined in Table 14 below.

Table 14: 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 5 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 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.	☑	☐	3.3
Access	Access to meet standards summarised in Table 8.	☑	☐	3.4
Water supply	Reticulated water supply to meet PBP acceptable solution specifications for a subdivision.	☑	☐	0
Electricity service	Electricity supply located underground.	☑	☐	3.6
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	☑	☐	0
Emergency Management	Bushfire emergency Management and Evacuation Plan to be completed prior to occupation of the building.	☑	☐	3.9

5. Recommendations

It is recommended that the proposed development be approved with consent conditions based on the findings in Table 14.

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Bruce Horkings
Senior Bushfire Consultant
FPAA BPAD Accredited Practitioner No. BPAD29962-L3

6. References

Industry Safety Steering Committee 3 (ISSC3). 2016. I*SSC3 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

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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 15 applies to the entire site 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 15: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)
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.
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.
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.

Appendix B - Access Standards

Table 16: 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 public road to the west and north, 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 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** One way public road (bus bay drop off zone) 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 17: 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** Northern Stub Road is a two-way sealed road.
	Minimum 8m carriageway width kerb to kerb;	**Complies** Northern Stub Road is approximately >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 internal of no greater than 500 m;	**Complies with performance criteria** Performance criteria addressed in Table 9.
	Curves of roads have a minimum inner radius of 6 m;	**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 18: 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 5.5 m 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 500 m;	**Complies with performance criteria** Performance criteria addressed in Table 9.
	Curves of roads have a minimum inner radius of 6 m	**Can comply**

Performance Criteria	Acceptable Solutions	Compliance notes
	The road crossfall does not exceed 3 degrees;	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.
	A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided.	

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