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Santa Sophia Box Hill – Bushfire Protection Assessment for SEARs Ref_9772

Catholic Education Diocese of Parramatta

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Contents

1. Property and proposal	3
1.1 Description of proposal	3
1.2 Response to SEARs.....	4
1.3 Assessment process.....	4
1.4 Bush fire prone land status	5
2. Bushfire threat assessment	7
3. Bushfire protection measures.....	10
3.1 Asset Protection Zones (APZ).....	10
3.2 APZ maintenance plan	10
3.3 Construction standard	12
3.4 Access	12
3.5 Services – Water, electricity and gas	13
3.5.1 Water	13
3.5.2 Electricity services	13
3.5.3 Gas services.....	13
4. Assessment of environmental issues	14
5. Conclusion.....	15
6. Recommendations	16
7. References	17
Appendix A – Assessment process	18

List of Figures

Figure 1: Location	6
Figure 2: Precinct E VMP Management Zones (Figure 3.1 from VMP dated Jan 2017).....	8
Figure 3: Bushfire hazard assessment and Asset Protection Zones (APZ)	9

List of Tables

Table 1: Subject site summary	3
Table 2: SEARs and Relevant Reference.....	4
Table 3: Summary of bushfire protection measures assessed.....	5
Table 4: Bushfire hazard assessment and APZ requirements	11
Table 5: Performance criteria for internal roads	12
Table 6: Performance criteria for reticulated water supplies (PBP page 35).....	13
Table 7: Summary of bushfire protection measures assessed.....	15

1. Property and proposal

Table 1: Subject site summary

Street address or property name:	12 Red Gables Road		
Suburb, town or locality:	Box Hill	Postcode:	2765
Lot/DP no:	Lot 25 -27 DP 255616		
Local Government Area:	The Hills Shire Council		
Zoning:	B2-Local centre & RE1 Public Recreation		
Type of development:	Special Fire Protection Purpose (SFPP)		

1.1 Description of proposal

This Bushfire Protection Assessment has been prepared by Eco Logical Australia on behalf of the Catholic Education Diocese of Parramatta c/TSA Management Pty Ltd (the Applicant).

It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 18_9772) for the new Santa Sophia Catholic College on the corner of Fontana Drive and the future road 'B', between Red Gables Road and Fontana Drive, in Box Hill North (the site).

The new school will cater for approximately 1,920 primary and secondary school students, inclusive of a 60 student Catholic Early Learning Centre. The school will have 130 full-time equivalent staff.

The proposal seeks consent for approximately 15,000sqm of floor space across a part five and part six storey building shown in **Figure 1**. The building will present as three main hubs connected by terraced courtyards and garden spaces.

The school will include:

- Catholic Early learning centre for 60 students;
- General Learning Spaces for years Kindergarten to 12;
- Community Hub – knowledge centre and cafe;
- Creative Hub – art and applied science;
- Performance Hub – multipurpose hall and music, dance and drama spaces;
- Professional Hub – administrative space;
- Research Hub – science and fitness;
- Associated site landscaping and open space including a fence and sporting facilities;
- Bus drop off from Fontana Drive;
- Pick-up and drop-off zone from future road 'B';
- Pedestrian access points from Red Gables Road north, Fontana Drive and future road 'B';
- Staff parking for 110 vehicles provided off site in an adjacent location;
- Short term parking for pick up and drop off for Catholic Early Learning Centre from Red Gables Road; and
- Digital and non-digital signage to the school.

The purpose of this Bushfire Protection Assessment is to identify Bushfire Protection Measures for Santa Sophia Catholic College.

This desktop assessment is based on information contained within the site plan from TSA Management Pty Limited, site inspection for town centre Bushfire Protection Assessment 17SUT_9152 (ELA, 2018) and online information from Google Earth and Nearmap.

1.2 Response to SEARs

The Bushfire Protection Assessment is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD 18_9772. This table identifies the relevant SEARs requirement/s and corresponding reference/s within this report.

Table 2: SEARs and Relevant Reference

Bushfire (Eco Logical Australia)	
SEARs Requirement	Report reference
Address bushfire hazard and, if relevant, prepare a report that addresses the requirements for Special Fire Protection Purpose Development as detailed in Planning for Bush Fire Protection 2006 (NSW RFS).	Eco Logical Australia. 2019 Santa Sophia Box Hill – Bushfire Protection Assessment for SEARs Ref_9772. Prepared for Catholic Education Diocese of Parramatta.'

1.3 Assessment process

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared having regard to the Secretary's Environmental Assessment Requirements issued for the project by DPE, ref no SEAR 18_9772 issued 21 December 2018.

This assessment forms part of the Environmental Impact Statement and has been prepared in accordance with, the requirements of clauses 6 and 7 of Schedule 2 the *Environmental Planning and Assessment Regulation 2000* (the Regulation). This proposal has been assessed under *Planning for Bushfire Protection (2006)* as required under Key Issue 17 in the SEARs.

Assessment included a review of background documentation, design team consultation and GIS analysis.

Table 3 identifies the bushfire protection measures assessed and whether these involved acceptable or performance solutions.

Table 3: Summary of bushfire protection measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
Construction standard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.4
Water supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Gas and electrical supplies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5

1.4 Bush fire prone land status

The subdivision includes land classified as bush fire prone on The Hills Shire Council’s bush fire prone land (BFPL) map¹.

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



Figure 1: Location

2. Bushfire threat assessment

A Vegetation Management Plan (VMP) (Cumberland Ecology 2017) and Master Plan- Site Wide Tree Strategy (AECOM 2018) have been prepared for the surrounding lands. The management zone of the VMP is shown in **Figure 2**. The vegetation on the north and east are mapped as 'PrE Zone 3: Rain Gardens' and 'PrE Zone 4: Recreation' and are considered managed land (Cumberland Ecology 2017) and are not considered a bushfire hazard in this assessment.

The land surrounding the proposed development is classified as 'Grassland' and is expected to be subject to future development in accordance with the precinct plan for the site. This land will be cleared for future development, landscaped recreation areas and cycle ways associated with the subdivision construction (Urbis 2015). A 50 m temporary APZ is proposed on all elevations until such time the land is developed. The APZ can be automatically extinguished once the land on the adjoining lots is developed, and the hazard is permanently removed.

Figure 3 shows the effective slope and predominant vegetation on transect lines representing the highest bushfire threat potentially posed to the development from various directions. The effective slope has been determined from 2 m contour data, initial site inspection for the town centre and the construction plans detailing the works within the VMP. The land across the development site is largely devoid of any undulations and falls within the PBP slope class '>0-5 degrees downslope'.

The site is located within the Local Government Area (LGA) of The Hills Shire Council and has a Fire Danger Index (FDI) of 100.

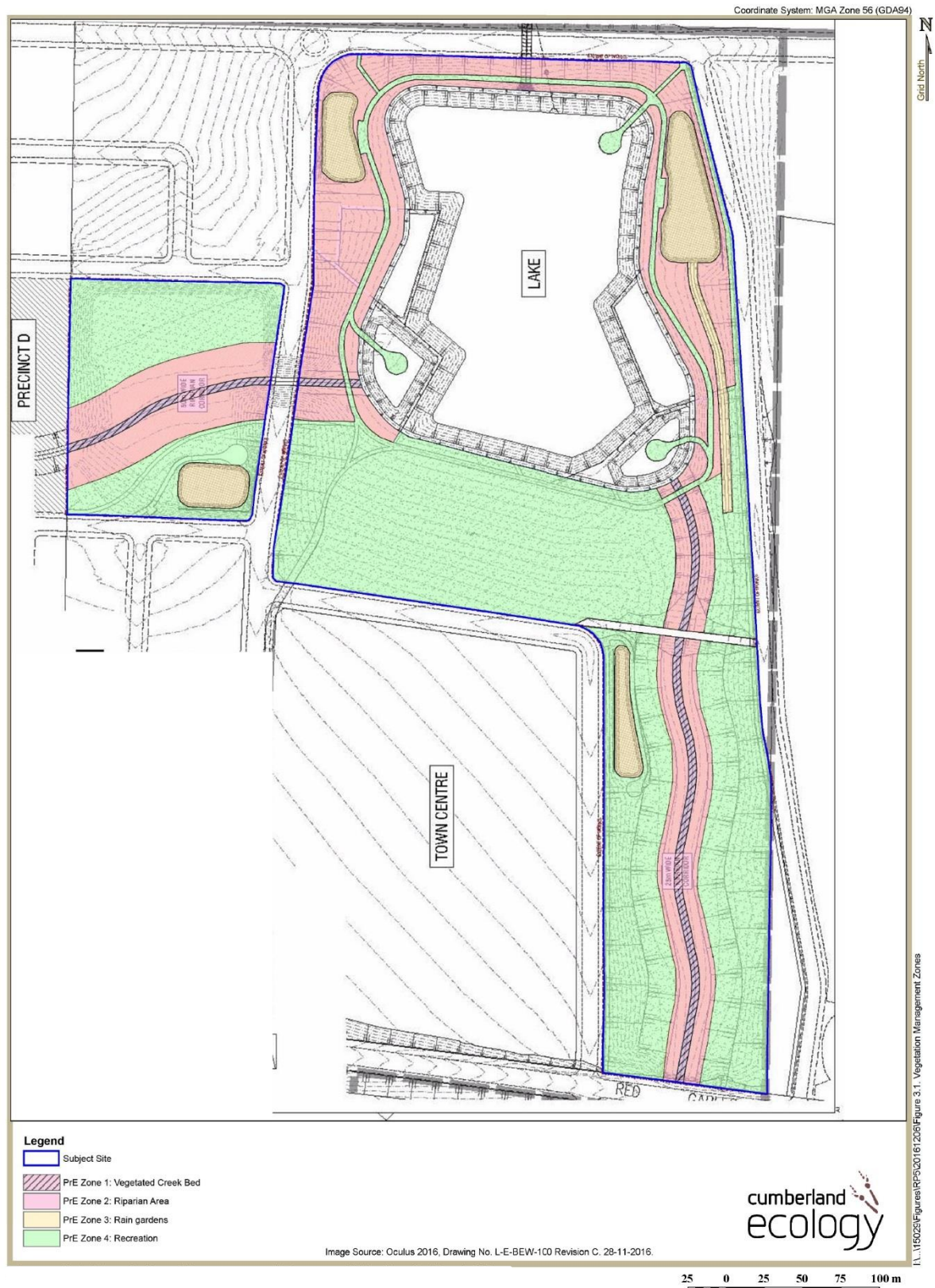


Figure 2: Precinct E VMP Management Zones (Figure 3.1 from VMP dated Jan 2017)

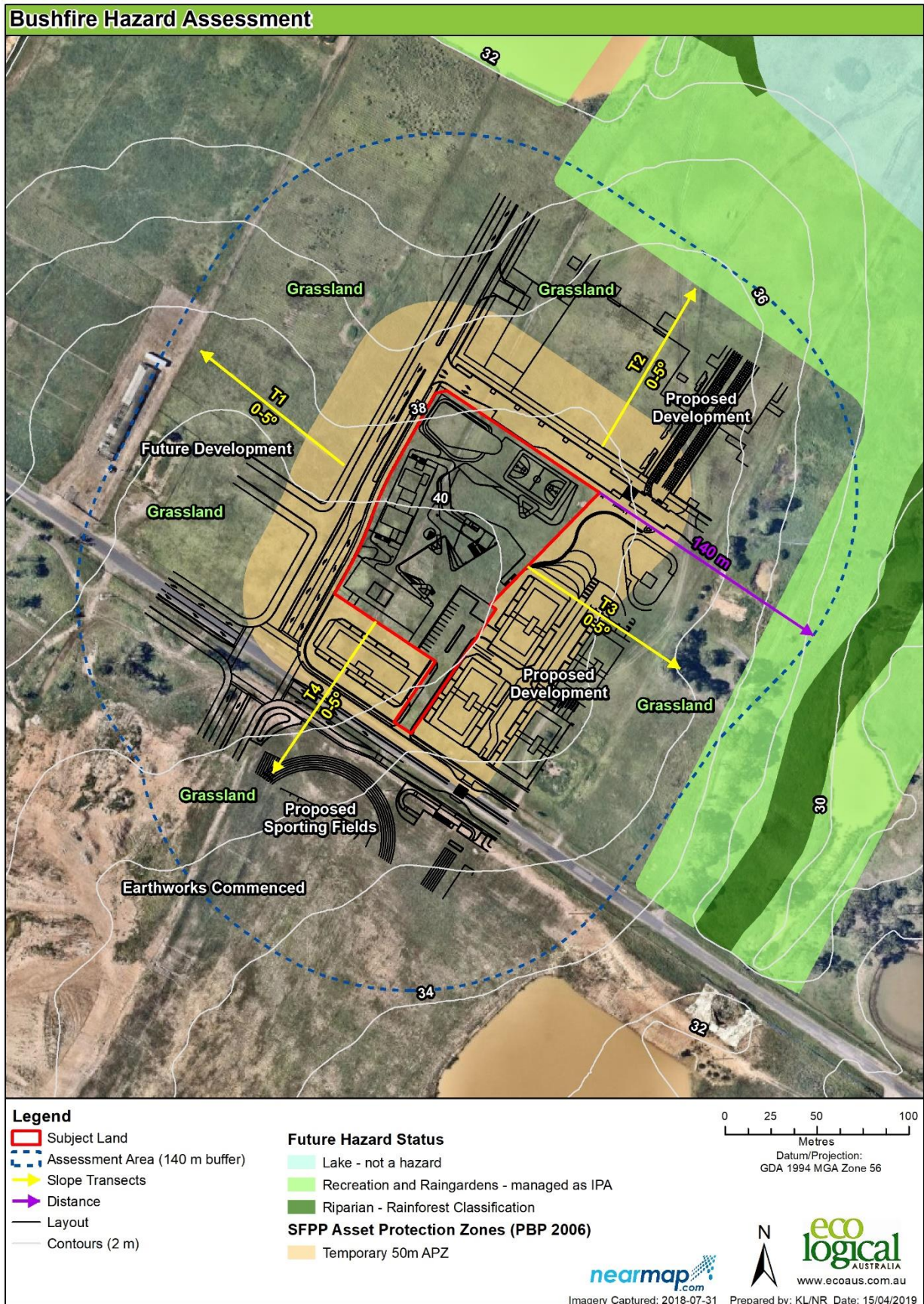


Figure 3: Bushfire hazard assessment and Asset Protection Zones (APZ)

3. Bushfire protection measures

3.1 Asset Protection Zones (APZ)

Table 4 shows the dimension of the Asset Protection Zone (APZ) required; and where relevant, information on how the APZ is to be provided is included. The footprint of the required APZ is also shown in **Figure 3**.

A temporary APZ is required in each direction. These APZ are part of a staged development. This land is expected to be cleared for development but is currently 'Grassland'. The APZ can be automatically extinguished once the land on the adjoining lot is developed, and the hazard is permanently removed.

3.2 APZ maintenance plan

The temporary APZs are to be managed to Inner Protection Area standards, until development occurs, as follows:

- Grass:
 - should be kept mown (as a guide grass should be kept to no more than 100mm in height) leaves and vegetation debris should be removed.

Further details on APZ implementation and management can be found on the NSW RFS website including:

https://www.rfs.nsw.gov.au/_data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf.

Table 4: Bushfire hazard assessment and APZ requirements

Lot # OR direction from development boundary	Transect	Slope ¹	Vegetation ²	SFPP required APZ (PBP 2006) ³	Temporary APZ	Available APZ	AS 3959-2009 Bushfire Attack Level (BAL) ⁴	Comment				
West	1	Downslope >0-5 degrees	Grassland	N/A	50 m	-	BAL-LOW	Temporary APZ provided until staged development occurs				
North	2	Downslope >0-5 degrees	Grassland	N/A	50 m	-	BAL-LOW	Temporary APZ provided until staged development occurs				
East	3	Downslope >0-5 degrees	Grassland	N/A	50 m	-	BAL-LOW	Temporary APZ provided until staged development occurs				
South	4	Downslope >0-5 degrees	Grassland	N/A	50 m	-	BAL-LOW	Temporary APZ provided until staged development occurs				

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

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

³ Assessment according to PBP 2006 Table A2.6

⁴ Assessment according to AS 3959-2009 Table 2.4.2

3.3 Construction standard

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of AS 3959-2009 'Construction of buildings in bushfire-prone areas'. The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

As demonstrated in **Table 4** a maximum of **BAL-LOW** is attained for the proposed development as there is no bushfire threat within 100 m of proposed buildings.

3.4 Access

Public road access to the proposed school is via Fontana Drive, Red Gables Road and 'Road B'.

The access is capable of complying with all of the PBP design specifications outlined in **Table 5**.

Table 5: Performance criteria for internal roads

Performance Criteria	Acceptable solutions	Complies
The intent may be achieved where:		
internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle.	internal roads are two-wheel drive, sealed, all-weather roads;	Complies
	internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions;	Not -proposed
	roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end;	Complies
	traffic management devices are constructed to facilitate access by emergency services vehicles.	Complies
	a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided.	Complies
	curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.	Complies
	the minimum distance between inner and outer curves is six metres.	Can comply
	maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.	Can comply
	crossfall of the pavement is not more than 10 degrees.	Can comply
	roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).	Can comply
	roads are clearly sign-posted and bridges clearly indicate load ratings.	Can comply
	the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).	Can comply

3.5 Services – Water, electricity and gas

3.5.1 Water

The proposal will be serviced by a reticulated water supply. **Table 6** identifies the acceptable solution requirements of Section 4.2.7 of PBP for which the proposal is compliant with, subject to the following specifications:

Table 6: Performance criteria for reticulated water supplies (PBP page 35)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
water supplies are easily accessible and located at regular intervals	access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads.	Can comply
	Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2017. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.	Can comply
	the provisions of public roads in section 4.1.3 in relation to parking are met	Can comply

3.5.2 Electricity services

Electricity supply to / within the subject land is located underground and therefore complies with Section 4.2.7 of PBP.

3.5.3 Gas services

Gas services (reticulated or bottle gas) are compliant with Section 4.2.7 of PBP, subject to the following specifications:

- Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 *The storage and handling of LP Gas* (SA 2014). Metal piping is to be used;
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation;
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal; and
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

4. Assessment of environmental issues

At the time of assessment, there were no known significant environmental features, threatened species or Aboriginal relics identified under the *Biodiversity Conservation Act 2016* or the *National Parks Act 1974* that will affect or be affected by the bushfire protection proposals in this report.

Department of Planning and the Environment is the determining authority for this development; they will assess more thoroughly any potential environmental and heritage issues.

5. Conclusion

The proposed SFPP development complies with all the acceptable solutions within ‘Planning for Bush Fire Protection 2006’, (see **Table 3**).

Table 7: Summary of bushfire protection measures assessed

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	APZ dimensions are detailed in Table 4 and Figure 3 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
APZ Maintenance plan	<input checked="" type="checkbox"/>	Identified temporary APZ to be maintained until adjoining development removes grassland hazard to the detailed specifications in Section 3.2 .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	<input checked="" type="checkbox"/>	A maximum of BAL-LOW is achievable for the proposed development as there is no bushfire threat within 100 m.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	Access to meet standard in Table 6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.4
Water supply	<input checked="" type="checkbox"/>	Reticulated water supply to meet PBP acceptable solution specifications for SFPP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.1
Electricity service	<input checked="" type="checkbox"/>	Electricity supply located underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.2
Gas service	<input checked="" type="checkbox"/>	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.3

6. Recommendations

It is recommended that the Special Fire Protection Purpose development be issued a Bushfire Safety Authority.



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



7. References

AECOM. 2018. *Master Plan – Site Wide Tree Strategy*

Cumberland Ecology. 2017, *Box Hill North- The Gables, Vegetation Management Plan- Precinct E*, prepared for Celestina Developments Pty Ltd

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

Keith, D. 2004. *Ocean Shores to Desert Dunes*. Department of Environment and Conservation, Sydney.

NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* including the 2010 Appendix 3 Addendum. Australian Government Publishing Service, Canberra.

Standards Australia (SA). 2009. Construction of buildings in bushfire-prone areas (including Amendments 1 – 3), AS 3959-2009. SAI Global, Sydney.

Standards Australia (SA). 2014. *The storage and handling of LP Gas*, AS/NZS 1596:2014. SAI Global, Sydney.

Standards Australia (SA). 2017. *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, Fifth edition 2017, SAI Global, Sydney.

Urbis. 2015. *Box Hill North Precinct, Precinct Boundary Plan*

Appendix A – Assessment process

Vegetation types

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

Effective slope

In accord 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 where the vegetation was found.

Asset Protection Zone determination

Table 2.4.2 of AS3959 has been used to determine the width of required Asset Protection Zone (APZ) for Grassland for the proposed development using the vegetation and slope data identified in **Section 2**.

