Bushfire Protection Assessment

Proposed Western Building: University of Wollongong

Prepared for
University of Wollongong

29 September 2017

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1 Property and proposal

Name:	University of Wollongong		
Street or property name:	Northfields Ave, Gwynneville		
Suburb, town or locality:	Wollongong	**Postcode:**	2515
Lot/DP no:	Lot 1 DP 1188267		
Local Government Area:	Wollongong		
Type of area:	Urban		
Type of development:	University buildings (non accommodation)		

1.1 Description of proposal

University of Wollongong (UoW) commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a Bushfire Protection Assessment (BPA) for the proposed Western Building at the abovementioned address (hereafter referred to as the subject land).

The proposal involves a new building to be utilised for teaching and offices, located directly west of the existing Early Start Facility (Discovery Space) in the western section of the University campus, where the existing carpark and demountable are located.

The subject land was inspected on the 9th June 2017.

1.2 Location and description of subject land

The subject land is located on the western side of the northern Wollongong suburb of Mount Ousley.

Figure 1 shows the subject land in relation to nearby bush fire prone vegetation and provides a hazard assessment for the proposed development.

Figure 2 contains the concept plans for the proposed Western Building.

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Figure 1: Bushfire hazard assessment

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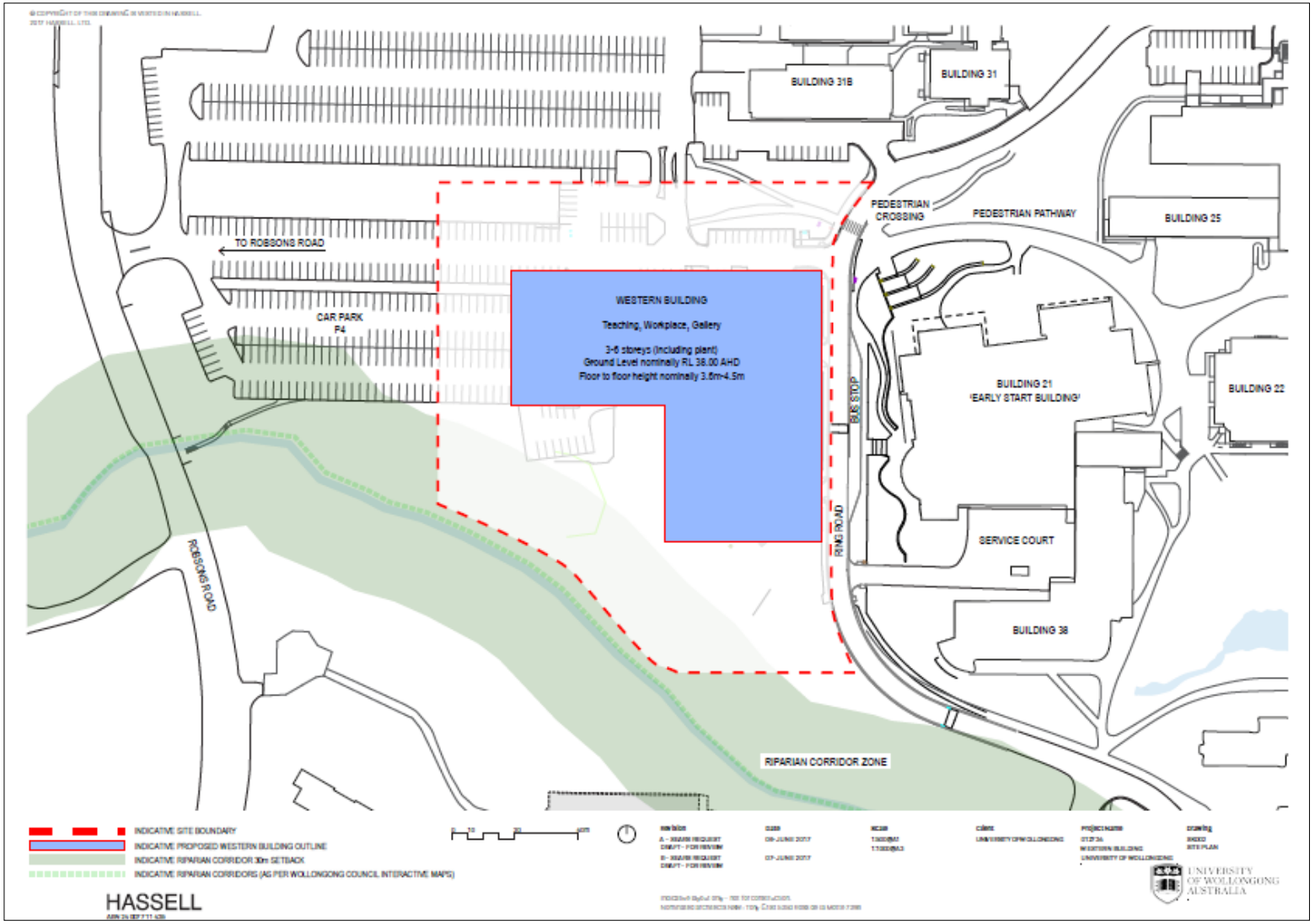

Figure 2: Site Plan

2 Bushfire hazard assessment

2.1 Assessment requirements

The subject land is identified as being bush fire prone on the Wollongong City Council Bush Fire Prone Land Map. As the development does not involve student or staff accommodation, Clause 46 of the *Rural Fires Regulation 2013* identifies that the requirements of Section 100B of the Rural Fires Act 1997 pertaining to a Special Fire Protection Purpose (SFPP) development do not apply. As such the proposed development is to be assessed under the provision of Section 79BA of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which includes the consideration of the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection* 2006 (NSWRFS 2006), referred to within this report as 'PBP'.

Whilst a Bush Fire Safety Authority (BFSA) under Section 100B is not required, the 'infill development' provisions of PBP still apply. This report assesses the development in accordance with these provisions, noting that as the development is not used for residential purposes the aim and objectives of PBP should be used to assess the merits of the proposal.

2.2 Vegetation types

In accord with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the subject land.

The predominant bush fire prone vegetation influencing the development consists of a narrow corridor of riparian vegetation along a small drainage line to the south of the proposed development site. Apart from this low hazard vegetation, the nearest bushland in the vicinity that is a bushfire hazard is located to the west over 100 m away, associated with the Illawarra Escarpment foothills.

The Wollongong Bush Fire Prone Land Map identifies the escarpment bushland as a bushfire hazard, with the large allotment that the university is situated captured as bush fire prone land. It is noted that the development site does not fall within mapped bush fire prone land. It is noted that the low hazard vegetation within the adjoining drainage line is not mapped as bush fire prone, however following the site inspection a conservative approach has been taken and an assessment of this vegetation has been undertaken.

The area of low hazard vegetation occurs to the south of the proposed development and is less than 1 ha in size, forming a corridor parallel to the proposed development ranging from 30 m to 50 m for a length of approximately 280 m. The vegetation is in a denuded state with a mix of native and exotic species with a grassy understorey directly south of the proposed footprint (see **Photo's 1 and 2, Appendix A**). In accordance with PBP 2006 low hazard vegetation uses 'Rainforest' to determine setbacks and construction standards as a surrogate for the reduced fire behaviour expected as shown in **Figure 1** and **Table 1**.

2.3 Effective slope

In accord with PBP the slope that would most significantly influence fire behaviour was determined over a distance of 100 m out from the boundary of the subject land where the vegetation was found. This assessment was made with a topographic map with 2 m contour intervals and verified on site.

The narrow band of vegetation aligning the drainage would only allow a possible uphill fire run perpendicular to the development that is less than 20 m. Due to the small size and narrow shape of the corridor, and insignificance of the short embankments on fire development and behaviour directly towards the development, the effective slope is determined to be within the PBP slope class of 'upslope/flat'.

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3 Asset protection zones

Table A2.4 of PBP has been used to identify the acceptable solution asset protection zone (APZ) dimensions for the development using the vegetation and slope data identified in **Section 2** and is tabulated below.

Table 1: Determination of APZ and construction standards

Direction from building	Slope[1]	Vegetation[2]	PBP required APZ[3]	Available APZ	AS 3959-2009 Construction Standard[4]	Comment
South	Flat	Low Hazard (Rainforest)	10 m	15 m	BAL-29	The available APZ is existing and does not require establishment.
West	>5-10° downslope	Wet Sclerophyll (Forest)	30 m	>100 m	BAL-LOW	APZ provided by adjoining managed land
All other directions	Managed land					

[1] Slope most significantly influencing the fire behaviour of the site having regard to vegetation found as per PBP.

[2] Predominant vegetation is identified, according to PBP.

[3] Assessment according to Table A2.4 of PBP.

[4] Assessment according to Table A2.4.2 of AS 3959-2009 'Construction of buildings in bushfire-prone areas'

3.1 APZ maintenance plan

The APZ is already in place and is to continue to be managed entirely to Inner Protection Area APZ standards as follows:

- No tree or tree canopy is to occur within 2 m of the dwelling roofline;
- The presence of a few shrubs or trees in the APZ is acceptable provided that they:
  - are well spread out and do not form a continuous canopy;
  - are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
  - are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission;
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter); and

4 Construction requirements

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

In response to the predicted bushfire attack, the proposed Western Building is to be constructed to **BAL-29** based on a minimum APZ of 15 m. It is a condition of consent that the APZ is maintained in perpetuity.

It is important that the current version of AS3959 is consulted. Further, the additional construction requirements as outlined in PBP (within the 2010 Appendix 3 Addendum) are to be implemented as applicable to the proposed development.

5 Utilities and access

5.1 Water supply

The University is currently serviced by reticulated water with hydrants located at frequent intervals around the facility and at key points of infrastructure. The proposed development will also be serviced by reticulated water and the spacing, location and installation for fire hydrants to comply with *Australian Standard AS 2419.1 'Fire hydrant installations – System design installation and commissioning'* (Standards Australia 2005).

5.2 Gas and electrical supplies

Electricity supply to the proposed Western Building is located underground and therefore complies with Section 4.1.3 of PBP.

Gas services (reticulated or bottle gas) will be compliant with the following specifications Section 4.1.3 of PBP:

- 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.

5.3 Access

The proposed Western Building will be accessed by the existing internal road network that provides access for emergency vehicles. The defendable space within the APZ on the western and southern elevations will allow fire-fighters to access and make use of water supplies and allow occupants to evacuate if necessary.

The BCA requirements for a perimeter road are driven by the compartmentation size of the building, which have been addressed within the Fire Engineering report prepared by ABS Fire Safety Pty Ltd

If new access or internal roads are required to support the development they are to be constructed to comply with PBP Section 4.1.7 Access – Internal Roads' as required as shown in **Table 2**.

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Table 2: Performance criteria for internal roads for SFPP developments (PBP page 35)

Performance Criteria	Acceptable Solutions
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; • 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; • 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; • traffic management devices are constructed to facilitate access by emergency services vehicles. • a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided. • curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress. • the minimum distance between inner and outer curves is six metres. • maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees. • crossfall of the pavement is not more than 10 degrees. • roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge). • roads are clearly sign-posted and bridges clearly indicate load ratings. • the internal road surfaces and bridges have a capacity

6 Assessment of environmental issues

A Flora and Fauna Assessment has been prepared in support of the proposed development (Narla Environmental Pty Ltd) containing recommendations to mitigate potential impacts from the proposed development. Site impacts have been minimised by carefully selected bushfire protection measures.

Wollongong City Council is the determining authority for this development; they will assess more thoroughly any potential environmental and heritage issues.

7 Recommendations and Conclusion

The proposal consists of the erection of a building to be used for teaching and offices within an existing university. By satisfying the acceptable solutions of PBP for 'infill' development, the proposal addresses the aim and objectives of PBP. The following recommendations have been made within this report:

- APZ are to be provided and maintained as specified at Section 3 of this report
- The proposed western building is to be constructed as specified at Section 4 of this report.
- Reticulated water supply is to be provided in accordance with *Australian Standard AS 2419.1 'Fire hydrant installations – System design installation and commissioning'* (Standards Australia 2005).
- Any gas or electrical services installed as part of the development are to comply with Section 6 of this report.
- Additional internal roads are to comply with **Table 2** of this report.

In the author's professional opinion the bushfire protection measures listed in this assessment comply with the specifications and requirements of *Planning for Bush Fire Protection 2006* in accordance with Section 79BA of the Environmental Planning and Assessment Act 1979.

If you have any questions or concerns in respect to this report, please contact Steven Houghton on (02) 8536 8634

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References

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Appendix A: Photos

Photo 1: Looking north from drainage line to proposed building site

Photo 2: Looking south from proposed APZ to drainage line

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ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management

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