Bushfire Assessment

Additions and alterations

All Saints Catholic Senior College, Casula

Sydney Catholic Schools

26 July 2017

(Ref: 17077)

report by
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FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

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1 Introduction

Street or property name:	20-30 Leacocks Lane		
Suburb, town or locality:	Casula	**Postcode:**	2170
Lot/DP no:	Lot 2 DP 773140		
Local Government Area:	Liverpool City Council		
Type of development:	Additions to a school (infill SFPP development)		

1.1 Background

Sydney Catholic Schools commissioned Peterson Bushfire to prepare a bushfire assessment of a proposed development at All Saints Catholic Senior College in Casula. This report presents the assessment and recommendations to achieve compliance with the relevant bushfire protection legislation and policy.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and description of school

The school is located between the Georges River and the Hume Highway as located on Figure 1. It is bounded by Leacock Regional Park on all sides except to the west where Lecocks Lane provides access to the school.

The school buildings form a cluster within the centre of the property on a ridge fronting Leacocks Lane. The remainder of the property, particularly to the north and east, is an approved asset protection zone, with direct connectivity to the bushland within the surrounding Leacock Regional Park. The bushland within the Regional Park acts as the bushfire prone vegetation affecting the site.

1.3 Proposed development

The proposal consists of improvements to the school consisting of minor additions and internal refurbishments. No additional classrooms or capacity for additional student numbers are proposed, and all works will be confined to the existing building footprint within the school. The external building work subject to bushfire assessment consists of the following:

- A covered walkway throughout the school. The walkway will be attached to some buildings (Blocks B2, B3, B4, B5, B6, B8, C, D1 and D2) by removing the existing verandah and attaching the new walkway to the existing roof;
- Alterations to Block A (administration) involving new external facade for most of the building;

- Alterations and minor additions to Blocks N and P;
- Alterations (new door doors and/or windows) to Blocks B2, B5, C, D1 and D2);
- New separate pavilion and COLA (Covered Outdoor Learning Area) within the central playground; and
- Landscaping and other minor improvements to the grounds.

A development site plan by Fulton Trotter Architects is included as Figure 2.

1.4 Assessment requirements

The property is identified as containing bushfire prone land as mapped on the Liverpool Bushfire Prone Land Map. Development proposals involving schools on bushfire prone land are defined 'Special Fire Protection Purpose' (SFPP) development by s100B *Rural Fires Act 1997* and require assessment in accordance with the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection 2006* (referred to as 'PBP' throughout this report). Section 4.2 of PBP addresses SFPP development and outlines the assessment methodology and protection measures, such as asset protection zone building setbacks from identified hazards, building construction standards to withstand bushfire attack (i.e. Bushfire Attack Levels – 'BALs'), adequate road access for emergency response and evacuation, the provision of water supply for fire-fighting, and vegetation management.

1.5 Previous approvals

Two significant developments have occurred at the school since the commencement of bushfire protection legislation for NSW in 2002. Bushfire protection at the school has been assessed on both occasions resulting in development consent conditions requiring establishment and ongoing maintenance of asset protection zones and vegetation management across the school property that will benefit and provide the bushfire protection necessary for the proposed improvements. The particulars of each previous approval are detailed in Table 1 below:

Table 1: Previous approvals

Approval year	Building	Block No.	Building protection	Asset protection zone
2006	Multi-purpose Hall, two classroom buildings	Blocks M (hall), B6 and B7	AS 3959 compliance	APZ for the entire school as mapped on Figure 3 and described in Section 3.1
2010	Science laboratories	Block Q	AS 3959 compliance	Complement 2006 approved APZ in north-west corner of site as mapped on Figure 3.

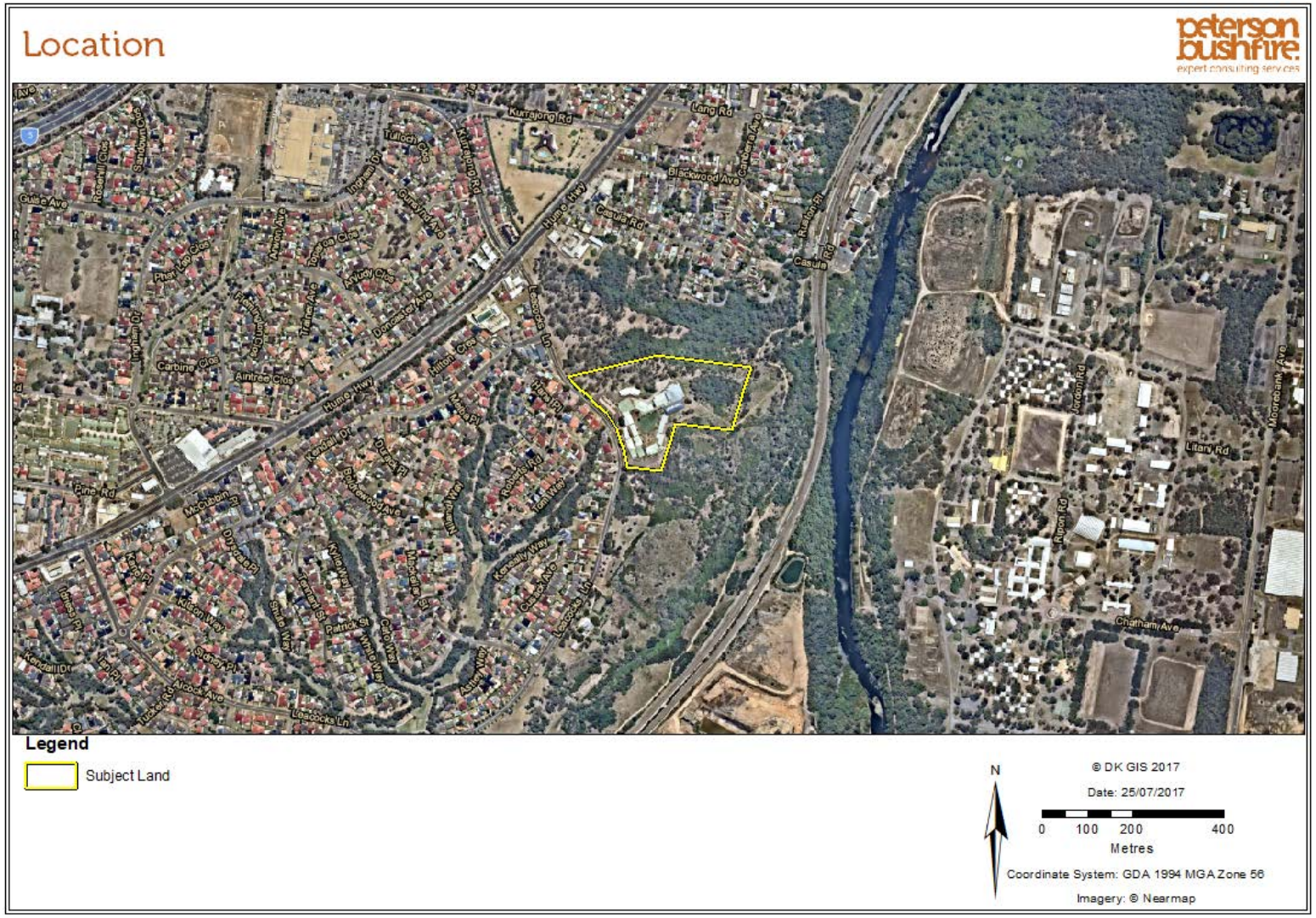

Figure 1: Location of All Saints Catholic Senior College

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Figure 2: Development site plan

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2 Bushfire hazard assessment

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone location and dimension and Bushfire Attack Level. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

Site assessment took place on 25th May 2017. Photographs are included in Appendix 1.

2.1 Predominant vegetation

The 'predominant vegetation' influencing fire behaviour approaching the school site has been assessed in accordance with the methodology specified within PBP. The bushfire hazard consists of bushland predominantly outside of the school property within the Leacock Regional Park to the north, east and south. Mapped and described as Shale Hills Woodland (BES 2004a and 2004b), the bushland is highly disturbed with infestations of Lantana and African Olive in the understorey. Due to the establishment of an asset protection zone around Blocks M, Q, B6 and B7 (refer to Figure 3), the woodland that remains as the hazard is predominantly located offsite within the Regional Park, although some woodland remains within the school property to the east. A narrow corridor of bushland to the west of the school is classified low hazard vegetation due to its width confined to less than 50 m by residential development.

2.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the hazard occurs within 100 m of the development proposal. The slope was determined using a 2 m contour layer (refer to Figure 3).

As indicated on Figure 3, the effective slope underneath the hazard within the 100 m assessment area is within the PBP slope class of 'downslope 15-18 degrees'. The land slopes steeply down the sides of the ridge to the north, east and south. The low hazard corridor to the west is on a slope in the class of 'downslope 5-10 degrees'.

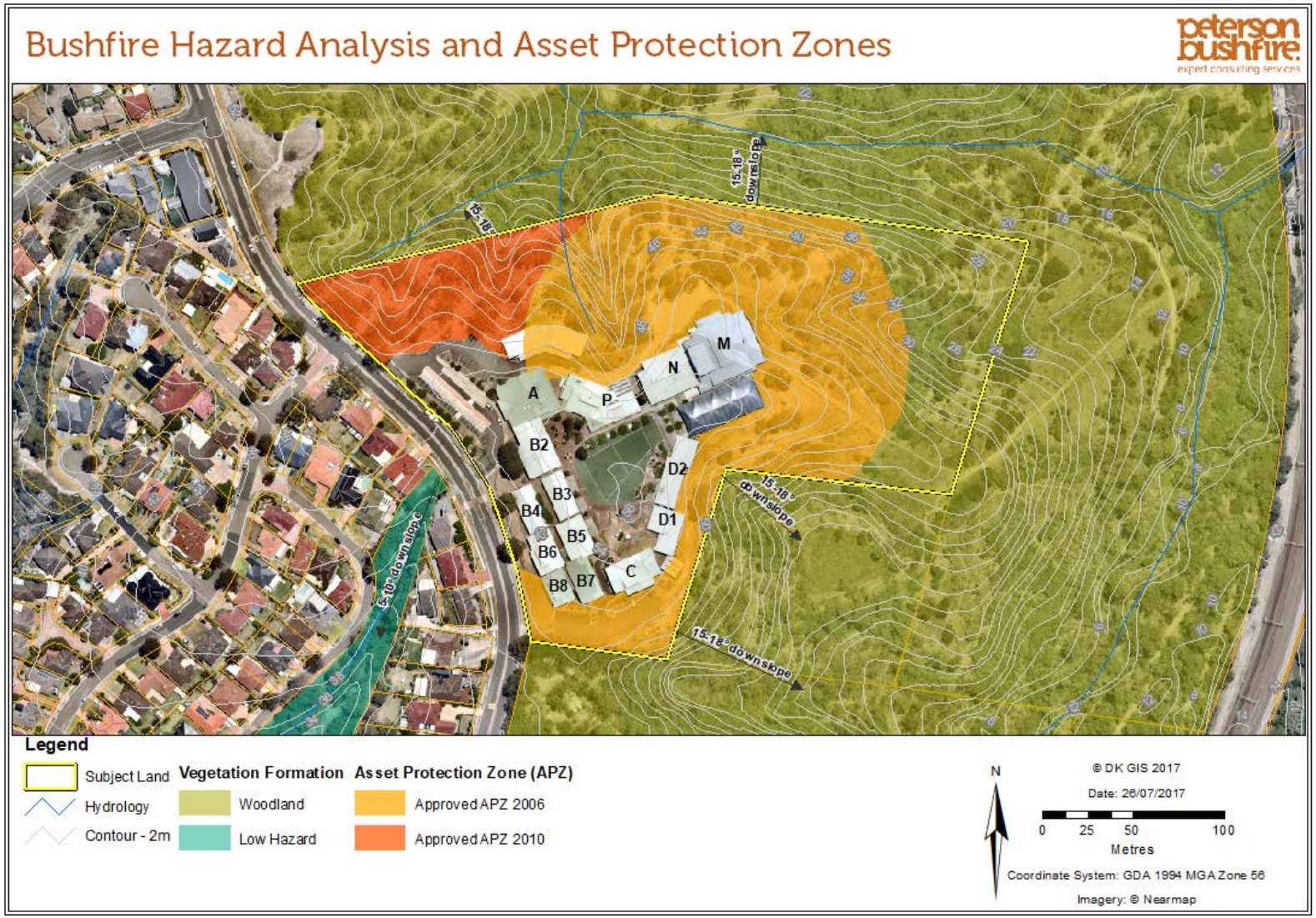

Figure 3: Bushfire hazard analysis and existing asset protection zone

3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for SFPP development. The measures required to be assessed are listed in Table 2 below and are discussed in detail in the remainder of this section.

Table 2: PBP bushfire protection measures

Bushfire protection measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from identified hazards.
Building construction standards (BALs)	Application of BALs to aspects of proposed external works.
Access	Assessment to include access and egress, perimeter access and design standards of internal roads.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.

3.1 Asset protection zones (APZ)

The approved APZs at the school are required to be maintained in accordance with the previous development consents. In combination, the approved APZs (refer to Figure 3) create a planning environment where the entire school site is to be treated as an APZ with exception for the eastern end of the school where part of the property greater than 80 m from the multi-purpose hall (Block M) is not affected by an APZ.

The approved APZ provides compliant separation to the proposed external building works in the north and east directions, however falls short in the south-east and south directions due to the close proximity of the property boundary and adjacent Regional Park. With respect to compliance with PBP, this short fall in APZ distance is permitted as the proposal consists of 'infill' development whereby the external building works are minor alterations to the external facade and minor additions (e.g. covered walkways, pavilion and COLA) to be made within the existing development footprint of the school.

As such, an additional APZ is not required, nor possible within the school grounds. The existing approved APZs provide a level of hazard separation compliant with PBP.

3.2 Vegetation management and landscaping

The APZ has been previously approved with the requirement to maintain as an Inner Protection Area (IPA) as mapped on Figure 3. The vegetation management within the APZ is to ensure IPA performance objectives which include thinning tree cover and removal and maintenance of understorey vegetation to the specifications listed at Condition No. 15.3 and 33.1 of DA 1123/2005.

Similarly, any proposed landscaping across the school property (i.e. outside of the mapped APZ as shown on Figure 3) should comply with the performance objectives of an IPA. The following can be used as a guideline to achieve the performance objectives:

a) Tree crowns are not to touch or overhang building rooflines.
b) Tree crowns may be touching when planted in rows.
c) Species used for landscaping should be low flammability species.
d) Shrubs and groundcover plantings should not be placed within 2 m of glazing.
e) Lawns are to be regularly mowed to ensure minimal grass heights.
f) Ground fuels such as sticks and leaf litter are to be regularly raked and removed.
g) Non-combustible mulch is to be used in garden beds within 2 m of a building. Organic mulch may be used in other areas providing it forms a thin and dense cover of wood chips (rather than leaf litter).

3.3 Bushfire Attack Level (BAL)

External building works within 100 m of the identified hazard will be required to comply with a building construction standard as listed under a specific BAL (Bushfire Attack Level) as prescribed by Australian Standard *AS 3959-2009 Construction of buildings in bushfire-prone areas* (referred to as AS 3959). As all existing buildings are located within 100 m of a hazard, all external building works will require compliance.

Those buildings closer to the hazard will generally have a higher BAL rating. As the school boundary and bushfire hazard is closest to the buildings on the south-eastern side, the BAL affectations come from that direction and predominate over the BALs from hazard located to the north and west. Table 3 on the following page lists those external building works and the corresponding BAL ratings in accordance with an assessment performed in accordance with PBP and Method 1 of AS 3959.

It is recommended that external building works are designed and constructed to comply with the BALs listed in Table 3. The NSW variation to AS 3959 is to be applied to BAL specifications. The variation can be found in the *Planning for Bushfire Protection Addendum Appendix 3 May 2010*: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0004/4396/Planning-for-Bush-Fire-Protection-2006-Addendum-Appendix-3.pdf.

Table 3: BAL ratings

Building	Elevation	BAL	Considerations
Covered walkways	All	Range from BAL-FZ in front of Blocks D1 and D2 to BAL-12.5 towards Block A	The covered walkways are proposed to be constructed from non-combustible materials therefore will comply with the full range of BALs.
COLA	All	BAL-40	The COLA is proposed to be constructed from non-combustible materials therefore will comply with the full range of BALs.
Pavilion	East and south	BAL-29	Exposed to hazard to the south-east.
	North and west	BAL-19	Shielded from the hazard.
Block N including addition between Block N and P	East, south and west	BAL-29	Exposed to hazard to the south-east.
	North	BAL-19	Shielded from the hazard.
Block P	East, south and west	BAL-19	Exposed to hazard to the south-east.
	North	BAL-12.5	Shielded from the hazard.
Block A	All	BAL-12.5	Considerable distance from all hazards.
Block B2	All	BAL-12.5	Considerable distance from all hazards.
Block B5	All	BAL-12.5	Considerable distance from all hazards.
Block C	East and south	BAL-FZ	Exposed to hazard to the south-east.
	North and west	BAL-40	Shielded from the hazard.
Block D1	North, east and south	BAL-FZ	Exposed to hazard to the south-east.
	West	BAL-40	Shielded from the hazard.
Block D2	North, east and south	BAL-FZ	Exposed to hazard to the south-east.
	West	BAL-40	Shielded from the hazard.

3.4 Access

The school has two existing access points; one along the northern boundary to the multi-purpose hall (Block M) and features a turning circle and hydrants, and a second from the southern boundary that provides emergency vehicle access into the central playground to the location of buildings and hydrants.

The existing access is adequate for the school and proposed development, particularly considering that the proposal consists of improvements only and will not increase student capacity. The access achieves the aim and objectives of PBP. Additional access provisions for bushfire protection are not required.

3.5 Water supply and utilities

Water supply

The existing hydrant network along Leacocks Lane and within the school property provide adequate hydrant coverage such that PBP and *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) are complied with. An additional water supply for fire-fighting is not required for the proposal.

Electricity supply

The supply of electricity to the school is below ground and therefore complies with PBP.

Gas supply

The installation of gas services is not proposed.

4 Conclusion and recommendations

4.1 Conclusive summary

The proposal consists of improvements to the school consisting of minor additions and internal refurbishments. No additional classrooms or capacity for additional student numbers are proposed, and all works will be confined to the existing building footprint within the school.

The school and proposed works benefit from an existing approved APZ surrounding the entire school buildings such that additional zoning is not required. Similarly, the existing access, water supply and utility installation complies with *Planning for Bushfire Protection 2006*. With the application of specific BALs to each component of building works, the development proposal will comply with *Planning for Bushfire Protection 2006* for infill Special Fire Protection Purpose development.

4.2 Recommendations

The recommendations made within this assessment are repeated below:

1. Any proposed landscaping across the school property (i.e. outside of the mapped APZ as shown on Figure 3) should comply with the performance objectives of an IPA. The following can be used as a guideline to achieve the performance objectives:
    a. Tree crowns are not to touch or overhang building rooflines.
    b. Tree crowns may be touching when planted in rows.
    c. Species used for landscaping should be low flammability species.
    d. Shrubs and groundcover plantings should not be placed within 2 m of glazing.
    e. Lawns are to be regularly mowed to ensure minimal grass heights.
    f. Ground fuels such as sticks and leaf litter are to be regularly raked and removed.
    g. Non-combustible mulch is to be used in garden beds within 2 m of a building. Organic mulch may be used in other areas providing it forms a thin and dense cover of wood chips (rather than leaf litter).
2. It is recommended that external building works are designed and constructed to comply with the BALs listed in Table 3. The NSW variation to AS 3959 is to be applied to BAL specifications. The variation is listed within *Planning for Bushfire Protection Addendum Appendix 3 May 2010*.

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References

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BES 2004b. *Flora and fauna assessment – Lot 2 DP 773140 Leacocks Lane, Casula.* Consultancy report prepared for Catholic Education Office.

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Standards Australia. 2009 (Amendment 3). *Construction of buildings in bushfire-prone areas*, AS 3959, Third edition 2009, Standards Australia International Ltd, Sydney.

Appendix 1 – Site photographs

Photograph 1: Blocks B3 and B5 showing verandah to be removed and covered walkway added

Photograph 2: APZ to the north of the school buildings

Photograph 3: APZ to the south-east of the school buildings

Photograph 4: Access road along northern interface showing turning circle and hydrant

Photograph 5: Access point to southern boundary

Photograph 6: Example of hydrant within centre grounds

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