Bushfire Hazard Assessment Report

Proposed redevelopment within existing school campus

"Infill SFPP"

For:
Pymble Ladies College
Avon Road, Pymble

Authorised by:
Pymble Ladies College
C/o Glendinning Minto and Associates P/L

Reference Number: 120083

27th February 2012
Revised 17th August 2012

Prepared By:
Building Code & Bushfire Hazard Solutions Pty Limited

Tel: (02) 9457 6530
Fax: (02) 9457 6532
PO Box 124
Berowra NSW 2081

FPA AUSTRALIA
Certified Business
Bushfire Planning & Design
BPD-BA-02354

www.bushfirehazardsolutions.com.au

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List of Abbreviations:

APZ	Asset Protection Zone
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Kuring gai Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NP	National Park
NPWS	National Parks and Wildlife Service
OPA	Outer Protection Area
PBP	*Planning for Bush Fire Protection* - 2006
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to the redevelopment of various existing assets and additional (new) construction within an existing school campus known as Pymble Ladies College, at Avon Road, Pymble. The new works are identified on Attachment 01 to this report.

The subject property has frontage to Avon Road to the northeast and northwest and abuts neighbouring private allotments to the southeast and Avondale Golf Club to the southwest. The vegetation identified as being the hazard is located to the southwest within Avondale Golf Club and north within the subject property. This revised report also addresses an area of bushland revegetation onsite that is located around a small watercourse totalling 1,180 m^2 in area.

Kuring-gai Council's Bushfire Prone Land Map indicates that the subject property is defined as containing Category 1 Vegetation and its associated 100 metre buffer zone. Therefore the application of Planning for Bushfire Protection - 2006 (PBP) must apply in this instance.

2.0 Purpose of Report

The purpose of this Bushfire Hazard Assessment Report is to provide Pymble Ladies College, Glendinning Minto & Associates P/L and Council with an independent bushfire hazard determination together with appropriate recommendations for both building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

Where Council considers a bushfire risk is associated with surrounding private lands or lands owned by an authority, Council could seek to issue notice under Section 66 of the Rural Fires Act on any or all surrounding properties for the purposes of reducing and maintaining safe levels of vegetation and thus reducing the possibility of bushfire impact to the subject property and any adjoining properties.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), the RFS document known as '*Planning for Bush Fire Protection* 2006' for the purposes of bushfire hazard determination and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009 as amended for building/structural provisions.

A company representative has made several site inspection of the subject property and the surrounding area.

5.0 Compliance Tables & Notes & aerial image of the site

	North	Southwest
Vegetation Structure	Remnant (<1ha)	Remnant (<1ha)
Slope	6 degrees up slope	5 degrees down slope
Existing Asset Protection Zone	>100 metres	>100 metres
Significant environmental features	Existing buildings and formed service trail	Existing tennis courts and formed service trail
Threatened species	APZ Existing (By DA Consent)	APZ Existing (By DA Consent)
Aboriginal Relics	APZ Existing (By DA Consent)	APZ Existing (By DA Consent)
Bushfire Attack Level (BAL)	Low	Low
Required construction Level	BAL Low	BAL Low
Proposed construction Level	BAL Low	BAL Low

Asset Protection Zones Compliance

As the project relates to infill Special Fire Protection Purpose compliance with Appendix 3 PBP 2006 is required. The separation distances available from the hazard interfaces to the proposed works are such that the project exceeds these minimum requirements and can comply with the higher performance objective of radiant heat levels being less than 10 kW/m^2.

The APZ's consist of maintained land entirely within the subject site including tennis courts and existing formed service trails within the subject property. Within the APZ is an area of bushland revegetation as detailed within the Vegetation Management Plan by Footprint Green Ref SSD 5314. This area can be retained as a fully vegetated structure and is 0.118 ha in size in a defined area that totals less than 20% of the total APZ area. It also fits the criteria of being an area of vegetation less than 1 ha in size and greater than 100 metres from a Category 1 hazard and greater than 30 metres from a Category 2 hazard. Therefore this retained vegetation area does not constitute a bushfire threat and does not compromise the Asset Protection Zones onsite.

Construction Level Compliance

The proposed building footprints are within a Bushfire Attack Level of 'Low' therefore requiring no construction provisions under AS3959 – 2009.

> *"The Bushfire Attack Level BAL—LOW is based on insufficient risk to warrant specific bushfire construction requirements".*

Access and Services

Guideline Ref.	Proposed Development Determinations	Compliance
Property Access	Access to the hazard interface is available via the existing formed service trails within the subject property or Avon Road.	Yes
Water Supply	Hydrants are currently installed throughout the site. Additionally several SWS are available onsite, including a swimming pool.	Yes
Emergency Management	The schools evacuation plan will be upgraded to address possible bushfire impact within the surrounding area. This upgrade is by prior DA consent and there is no requirement to repeat this recommendation as part of these new works.	Yes
Electrical Supply	Existing supply connected.	Yes
Other	N/A	N/A

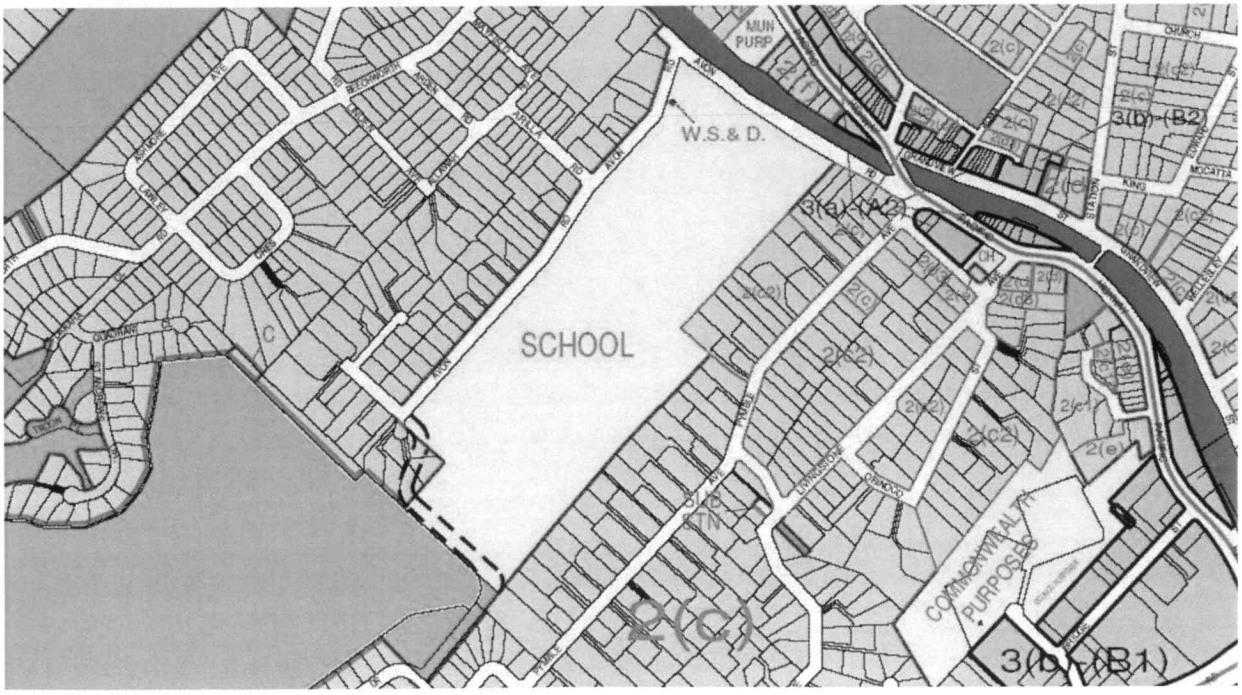


Image 01: Extract from Kuring-gai Councils Zoning Map

6.0 Bushfire Hazard Assessments

6.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document '*Planning for Bush Fire Protection* - 2006' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZs) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2009 'Construction of buildings in bushfire prone areas'.

Planning for Bush Fire Protection – 2006, (PBP) formally adopted on the 1st March 2007 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable. The subject development relates to both new construction and renovations of existing assets within an existing school campus known as Pymble Ladies College. To accord with PBP the development is classified as integrated development and assessed as "Infill Special Fire Protection Purpose" in accordance with section 4.2.5 PBP 2006.

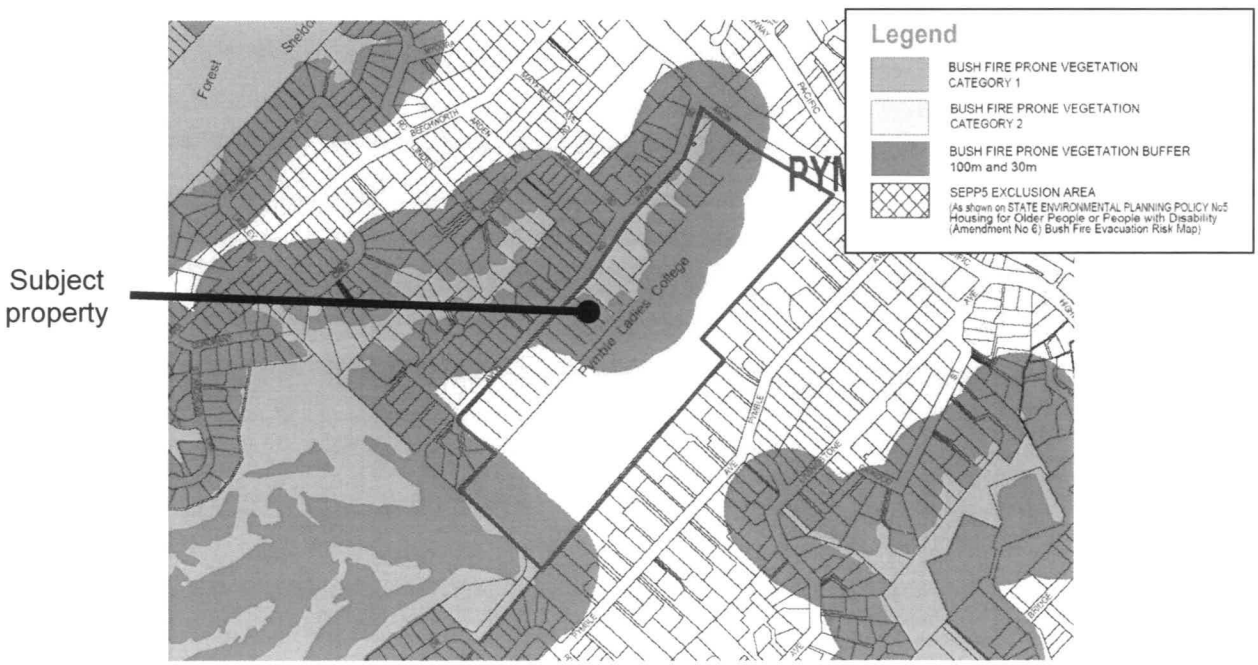
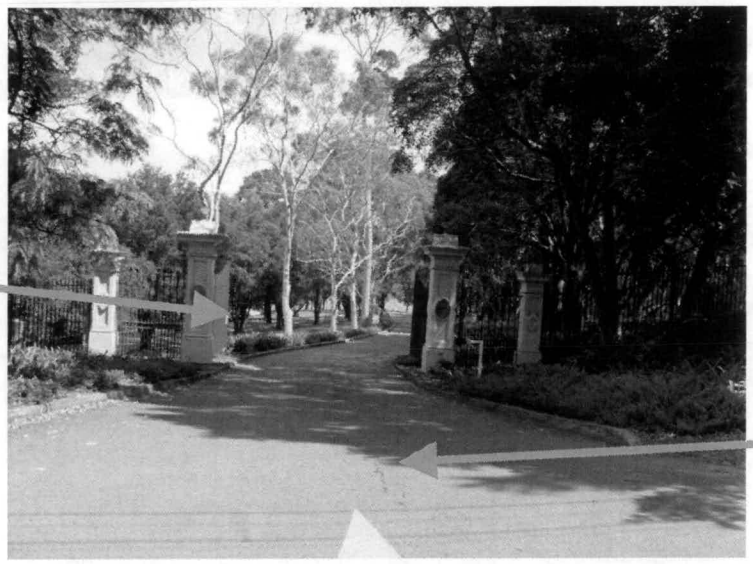


Image 02: Extract from Kuring-gai Council's Bushfire Prone Land Map

6.02 Location

The subject property is known as Pymble Ladies College, located along Avon Road, Pymble and is located within Kuring-gai Councils Local Government Area. The subject property has street frontage to Avon Road to the northeast and northwest. The proposed works are located centrally within the School and were found to be > 100 metres from any identified hazard.

The possible bushfire impact to the site as a whole is from fires burning within remnant vegetation to the north (within the subject property) and to the southwest within Avondale Golf Club.



Photograph 01: View southwest from Avon Road

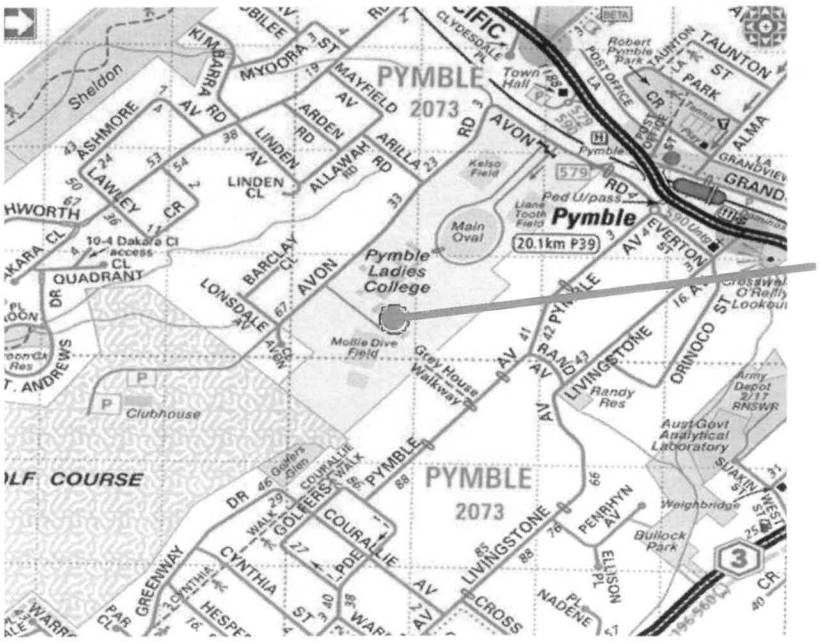


Image 03: Extract from street-directory.com.au.

6.04 Vegetation

The predominate vegetation within the subject property was found to consist of maintained lawns, gardens and sports ovals. The vegetation that is posing a hazard to the proposed works is located to the southwest within Avondale Golf Club and north within the subject property.

The vegetation posing a hazard to the proposed development was found to consist of trees 10—30 metres in height, with a 30-70% foliage cover and an understorey of small trees and shrubs. The vegetation within the subject property and Avondale Golf Club was found to be less than one (1) hectare in size and therefore in accordance with Appendix 2.3 of Planning for Bushfire Protection 2006 the Remnant Vegetation principle has been applied to these aspects.

For the purpose of assessment under PBP the vegetation to the north and southwest has been determined to be Remnant.

The Vegetation Management Plan by Footprint Green Ref SSD 5314 details retention and restoration of an area of bushland around a small creekline area. This area is to be retained as a fully vegetated structure and is 0.118 ha in size and greater than 100 metres from any other hazard. The New South Wales Rural Fires Service Guideline for Bushfire Prone Land Mapping (Version 3, 28 June 2006) states that:

> *"Vegetation as defined in this clause is excluded from the above mentioned vegetation groups.*
> *Areas of "Vegetation groups" 1, 2 and 3, less than 1 hectare and not less than 100m lateral separation from a Bush Fire Vegetation Category 1, or not less than 30m lateral separation from a Bush Fire Vegetation Category 2, <u>are excluded</u>;"*

Therefore this retained vegetation area does not constitute a bushfire threat to the proposed development.

Photograph 02: View north from the existing form service trail toward the northern hazard

Photograph 03: View south from the southern boundary of the subject property into Avondale G.C.

6.03 Slope and Topography

The slope that would most significantly affect fire behaviour must be assessed for at least 100 metres from the proposed works. The slope that would **most significantly** influence bushfire impact towards the proposed works was determined to be:

- 6 degrees up slope within the hazard to the north
- 5 degrees down slope within the hazard to the southwest

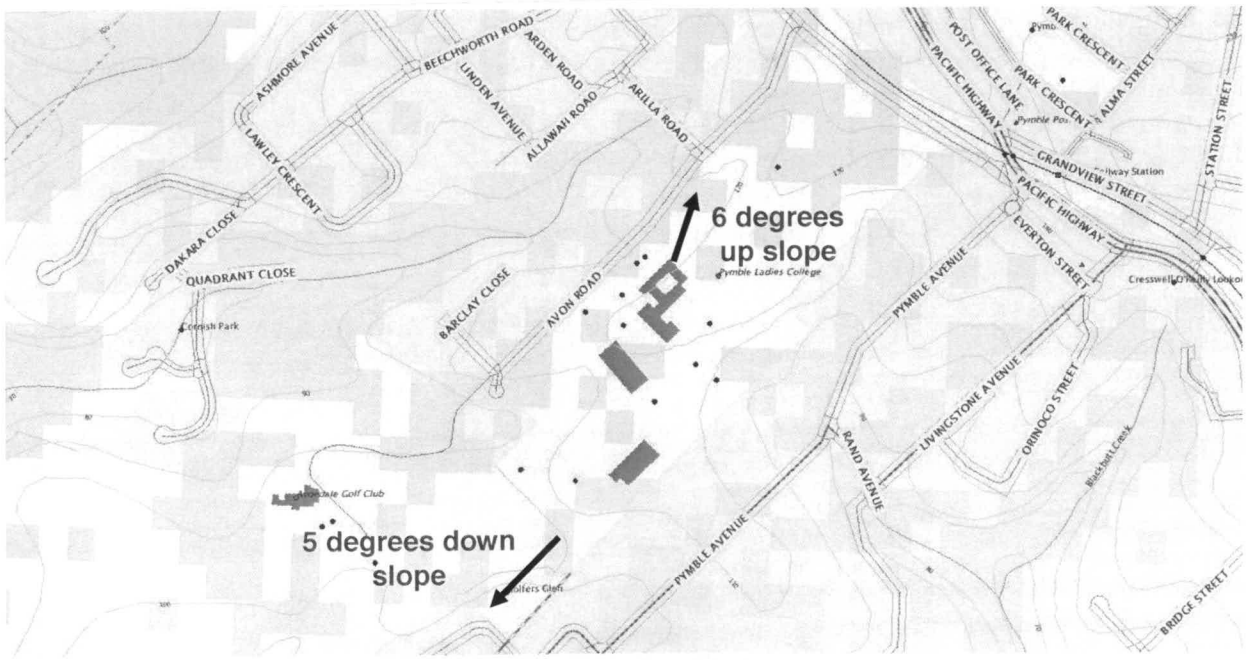
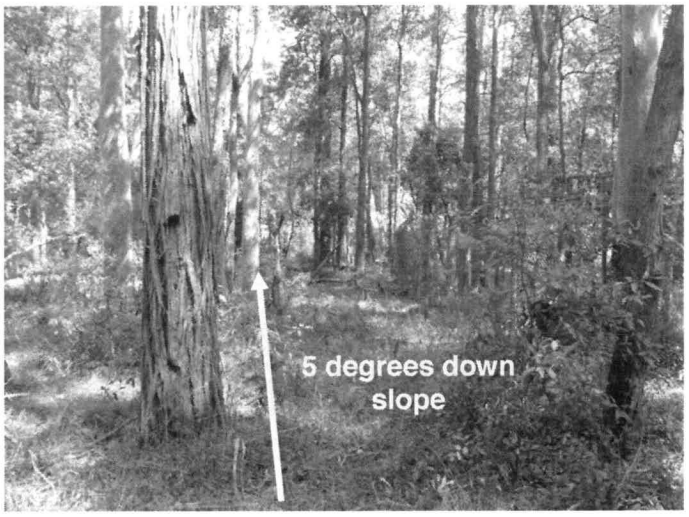


Image 04: Extract from the Department of Lands SixViewer Portal



Photograph 04: View south from the southern boundary of the subject property

6.05 Asset Protection Zones

The subject property is an existing educational establishment located in a residential area. Following our onsite assessment and a review of plans provided we found that an Asset Protection Zones (APZ) of >100 metres is available from all proposed building footprints. These existing APZ's consist of maintained land, tennis courts, existing hard surfaced areas and formed service trails within the subject property.

The existing Asset Protection Zones within the subject property are already enforced by way of development consent for a previous development within the subject property. Within the APZ is an area of bushland revegetation as detailed within the Vegetation Management Plan by Footprint Green Ref SSD 5314. This area can be retained as a fully vegetated structure and is 0.118 ha in size in a defined area that totals less than 20% of the total APZ area. It also fits the criteria of being an area of vegetation less than 1 ha in size and greater than 100 metres from a Category 1 hazard and greater than 30 metres from a Category 2 hazard. Therefore this retained vegetation area does not constitute a bushfire threat and does not compromise the Asset Protection Zones onsite.

Photograph 05: View north from the southern boundary of the subject property

Photograph 06: View north from within the subject property.

6.06 Fire Fighting Water Supply

The College is connected to the existing reticulated town's water main for domestic and commercial needs. Hydrants and hose reels are located throughout the school grounds. Further to this there are existing in-ground hydrants available along Avon Road.

The existing water supply complies with the requirements of PBP 2006 and is considered suitable for the replenishment of Fire Service vehicles.

Photograph 07: View north along the existing service trail within the subject property.

6.07 Property Access – Fire Services & Evacuation

The existing internal access system connects with Avon Road to the northern and northwest. This internal access system provides direct access to the hazard interface to the southwest and north. Fire Services have free access to the rear of the property and around the proposed building footprints. The existing lower entry from Avon Road has recently been upgraded and complies with the requirements of PBP 2006.

Existing avenues of access for Fire Services are considered satisfactory.

7.0 Site & Bushfire Hazard Determination

7.01 *Planning for Bush Fire Protection* - 2006

'*Planning for Bush Fire Protection* – 2006' (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- *within or within 100m of high or medium bushfire hazards; or*
- *within or within 30m of low bushfire hazards.*

Northern Aspect:

a) Vegetation Structure Remnant (<1ha)
b) Slope 6 degrees up slope
c) A >100 metre Asset Protection Zone is available
d) The Bushfire Attack Level was determined to be 'Low'
e) With a Bushfire Attack Level of 'Low' the proposed works require no construction provisions under AS3959 – 2009

South Western Aspect:

a) Vegetation Structure Remnant (<1ha)
b) Slope 5 degrees down slope
c) A >100 metre Asset Protection Zone is available
d) The Bushfire Attack Level was determined to be 'Low'
e) With a Bushfire Attack Level of 'Low' the proposed works require no construction provisions under AS3959 – 2009

7.02 Australian Standard AS 3959 – 2009 'Construction of buildings in bushfire –prone areas'

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the *Planning for Bush Fire Protection* – 2006 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009.

7.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m^2)	Level of construction under AS3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

7.04 Viable Construction Method

The objectives of *Planning for Bush Fire Protection* – 2006 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

The highest Bushfire Attack Level to the proposed dwelling was determined from Table 2.4.2 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' – 2009 to be 'BAL LOW'

AS3959 – 2009 *This Standard does not provide construction requirements for buildings assessed in bushfire-prone areas in accordance with Section 2 as being BAL—LOW.*

AS3959 – 2009 *The Bushfire Attack Level BAL—LOW is based on insufficient risk to warrant specific bushfire construction requirements.*

No construction recommendations are required for the proposed new works.

7.05 Site Specific Bushfire Hazard Determination

All property development must be assessed on an individual basis as broad-brush approaches of documents such as PBP may not be applicable in every instance. The proposed development located at Pymble Ladies College complies with the provisions of Planning for Bushfire Protection 2006. The development was assessed noting the following:

a) Water supplies for fire fighting purposes are adequate.
b) The proposed works are within a Bushfire Attack Level of 'Low'.
c) Current grounds (excluding Remnant Vegetation) comply with performance requirements of Appendix 2 and 5 PBP 2006.
d) The existing internal access system provides vehicle access around the subject property for attending fire services.

7.06 Risk Rating

In assessing the bushfire threat to the site and its structures it is important to have a holistic approach and assess the risk of a bushfire occurring and impacting the subject property. It is also important to include the risk the site poses to neighbouring properties.

Image 05 is an overview of risk to the subject property. This model takes a holistic approach and assesses the risk of a bushfire occurring and impacting the site. This risk level can be reduced by either an increase in preparedness by the owners/occupants of the site (e.g. good house keeping, maintained lawns & bushfire awareness) and/or hazard reduction activities by local fire agencies. Alternatively this risk level can increase if the preparedness level decreases and/or hazard reduction activities are neglected for the area.

The below matrix is for risk only, it does not reflect the Bushfire Attack Level determined within PBP 2006.

Consequence / Likelihood	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	Extreme
Possible	Insignificant	Low	Medium	High
Unlikely	Insignificant	Insignificant	Low	Medium

8.0 Recommendations

Given that the proposed works are within a Bushfire Attack Level of 'Low', the existing water and access supply are satisfactory and that the formal Asset Protection Zones and Emergency Management have already been enforced and addressed by previous development applications we make no further recommendations for this development.

9.0 Conclusion

Given that the property is deemed bushfire prone under Kuring-gai Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bushfire Protection – 2006 and the construction requirements of AS3959 – 2009. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The subject property is a large education establishment within an existing residential area. The proposed development is integrated development and has been assessed as Infill Special Fire Protection Purpose as specified in section 4.2.5 PBP 2006.

The vegetation posing a hazard to the proposed works was found to be located to the north within the subject property and southwest within Avondale Golf Club. The vegetation to the north and southwest was determined to be Remnant.

The separation distances available from the hazard interfaces to the proposed works are such that the project exceeds these minimum requirements of Appendix 3 for infill development and can comply with the higher performance objective of radiant heat levels being less than 10 kW/m^2. The APZ's consist of maintained land, tennis courts, swimming pools and existing formed service trails within the subject property. Within the APZ is an area of bushland revegetation as detailed within the Vegetation Management Plan by Footprint Green Ref SSD 5314. This area can be retained as a fully vegetated structure and is 0.118 ha in size in a defined area that totals less than 20% of the total APZ area. It also fits the criteria of being an area of vegetation less than 1 ha in size and greater than 100 metres from a Category 1 hazard and greater than 30 metres from a Category 2 hazard. Therefore this retained vegetation area does not constitute a bushfire threat and does not compromise the Asset Protection Zones onsite.

The highest Bushfire Attack Level to the proposed works was determined to be 'Low' requiring no construction provisions under AS3959 – 2009.

Given that the proposed works are within a Bushfire Attack Level of 'Low', the existing water and access supply are satisfactory and that the formal Asset Protection Zones and Emergency Management have already been enforced and addressed by previous development applications we make no further recommendations for this development.

I am therefore in support of the development application. Should you have an questions please do not hesitate in contacting me.

Prepared by
Building Code & Bushfire Hazard Solutions

Wayne Tucker
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Ass Dip Applied Science
Manager - Bushfire Section
Building Code and Bushfire Hazard Solutions
Fire Protection Association of Australia BPAD – A Certified Practitioner
Certification number – BPD – PA-09399

Reviewed by
Building Code & Bushfire Hazard Solutions P/L

Stuart McMonnies
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – A Certified Practitioner
Certification number – BPD – PA-09400

10.0 Annexure 01

List of Referenced Documents

a) *Environmental Planning and Assessment Act* 1979

b) Rural Fires Act 1997

c) '*Planning for Bush Fire Protection*'- 2006 - NSW Rural Fire Services & Planning NSW

d) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2009 (as - amended) – Standards Australia

e) 'Kuring-gai Council's Bushfire Prone Land Map'

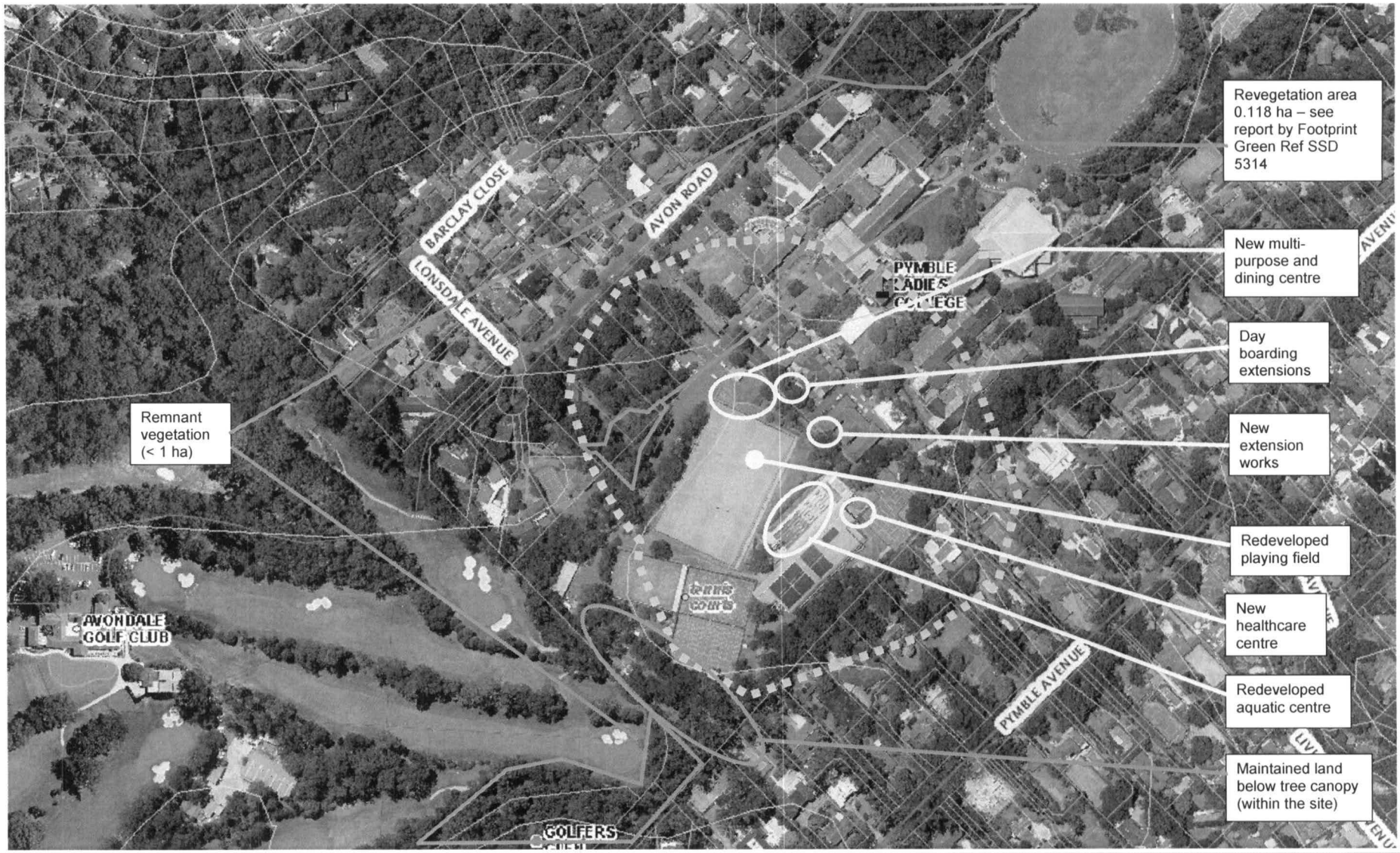
f) Acknowledgements to:

UBD Directories
NSW Department of Lands – Sixviewer
Street-directory.com.au

Attachments

Attachment 01: Site schematic showing location of proposed new works

Attachment 02: Aerial view and photo montage of the subject site



Building Code & Bushfire Hazard Solutions
(Pty. Limited) ABN 19057 337 774
PO Box 124 Berowra, NSW 2081
Telephone: (02) 9457 6530 Facsimile: (02) 9457 6532
Email: enquiries@bushfirehazardsolutions.com.au

FPA AUSTRALIA
Certified Business
Bushfire Planning & Design
BPD-PA-02354

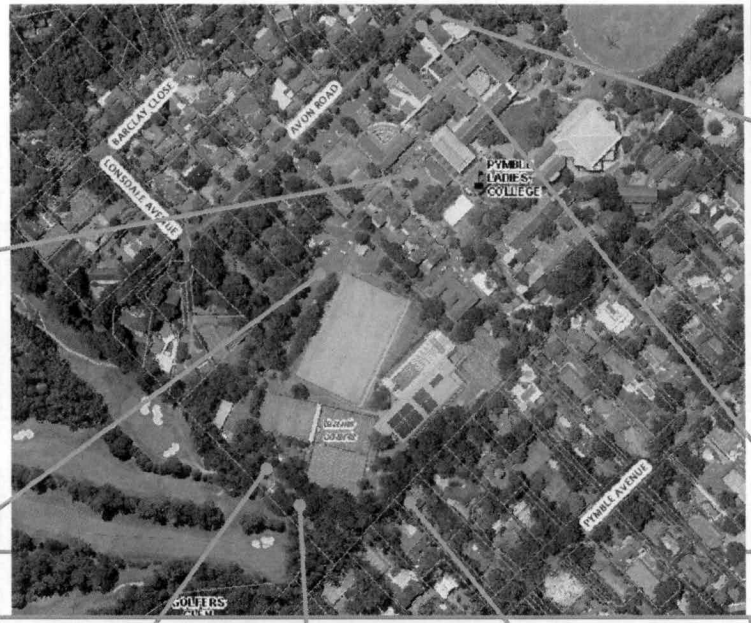
Approx. 100 metre arc around new development

NOT TO SCALE

Subject Property: Pymble Ladies College

Date: 19th 8 2012 | Job Ref: 120083

Site schematic



Aerial view and photographic montage of

Pymble Ladies College

Avon Road Pymble

17th August 2012 / Our Ref: 120083