

**BUSHFIRE PROTECTION ASSESSMENT
FOR THE
PROPOSED RESIDENTIAL DEVELOPMENT
ON**

**LOT 1 & 2 in DP 583803; LOT 2 in DP 205504;
LOT 1 in DP 403072 and LOT 3 in DP 403072**

**No. 1, 1A and 5 AVON ROAD and No. 4 BEECHWORTH ROAD,
PYMBLE**

**PREPARED ON BEHALF OF JW NEALE PTY LTD
[Receivers & Managers Appointed]**



Australian Bushfire Protection Planners Pty Limited

Bushfire Mitigation Consultants

ACN 083 085 474

RMB 3411 Dog Trap Road

SOMERSBY 2250 NSW

Phone: (02) 43622112 Fax: (02) 43622204

Email: abpp@bigpond.net.au

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EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited has been commissioned to prepare a Bushfire Protection Assessment Report for the construction of a two hundred and seventy three [273] unit residential development on land within No. 1, 1A and 5 Avon Road and No. 4 Beechworth Road, Pymble.

The development site has a total area of 23.667m² and consists of Lot 1 & 2 in DP 583803; Lot 2 in DP 205504; Lot 1 in DP 403072 and Lot 3 in DP 403072 and is bound by the North Shore Railway Line to the northeast, Avon Road to the east, Mayfield Avenue and Beechworth Road to the west and northwest and 1 Arilla Road to the south.

This report responds to the Preferred Project Requirements issues by the Department of Planning and Infrastructure (DP&I) on 19th April 2011 requesting the preparation of a 'Preferred Project Report'. The Preferred Project Requirements specify key issues identified by the DoP&I through their initial assessment of the proposal.

Schedule 1 – Key Issues identifies the following bushfire protection related matters:

Environmental constraints:

The PPR should provide a more coordinated analysis of the capacity of the site in a single document, with particular reference to the submissions from Department of Environment Climate Change and Water (DECCW), NSW Office of Water (NOW), Rural Fire Services (RFS) and Kuring- gai Council. This further analysis may require a review of the submitted Flora and Fauna Assessment, Vegetation Management Plan (VMP), and Landscape Masterplan, and should map the required bushfire Asset Protection Zone (APZ) and the required CRZ on one diagram together with the location of building footprints and other key infrastructure such as drainage works and pathways. The PPR should also consider options for relocating the Stage 3 and 4 Concept Plan envelopes clear of the Core Riparian Zone

The PPR should also address the inconsistencies between the Flora and Fauna Assessment, VMP, Bushfire Assessment and Landscape Masterplan identified by Agency submissions.

SCHEDULE 2- ADDITIONAL INFORMATION REQUIRED/ COMMENTS

The Bushfire Mapping shall be amended in accordance with Council's submission dated 4 February 2011.

A review of the Ku-ring-gai Council Bushfire Prone Land Map has confirmed that the site is not mapped as containing bushfire prone vegetation however the south-eastern portion, or Avon Road frontage of the site is mapped as containing part of the 100 metre wide buffer zone to the Category 1 Bushfire Prone Vegetation mapped within the north-western corner of Pymble Ladies College [PLC].

The development, being the construction of a multi-unit residential complex, part of which is located within the buffer zone to a bushfire prone area is required to comply with the provisions of Section 79BA of the *Environmental Planning & Assessment Act 1979* and provide bushfire protection measures in accordance with *Planning for Bushfire Protection 2006*. However, the building will be subdivided into Strata Title Units once completed and for the purpose of this report is deemed to be Integrated Development as defined by Section 91 of the *Environmental Planning & Assessment Act 1979*.

The provisions of Section 100B of the *Rural Fires Act 1997* apply to Integrated Development and the development is required to comply with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.

This report responds to the matters raised in the DOP&I Key Issues and examines the proposed development against the requirements of *Planning for Bushfire Protection 2006* and provides advice on the suitability of the development in addressing the availability of separation of the proposed buildings from the retained vegetation, access and water supplies for fire-fighting operations and the requisite level of bushfire construction standards to the buildings.



Graham Swain
Managing Director,
Australian Bushfire Protection Planners Pty Limited.

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SECTION 1

INTRODUCTION

1.1 Aim of this Assessment.

The aim of this Bushfire Protection Assessment Report is to address the requirements of the Key Issues raised by the Department of Planning & Infrastructure [letter dated 19.4.2011] relating to bushfire protection matters and to determine compliance with the intent of *Planning for Bushfire Protection 2006*.

1.2 Development Proposal.

The Preferred Project, being the modified design concept includes the following works:

Concept Plan

Construction of 273 residential apartments and the following works:

- Demolition of existing buildings;
- Construction of four residential apartment buildings (being Buildings 1, 3, 4 and 5) varying between four and six storeys in height;
- Excavation to provide basement level parking with a total of 324 car parking spaces;
- Provision of access roads and internal pedestrian links.

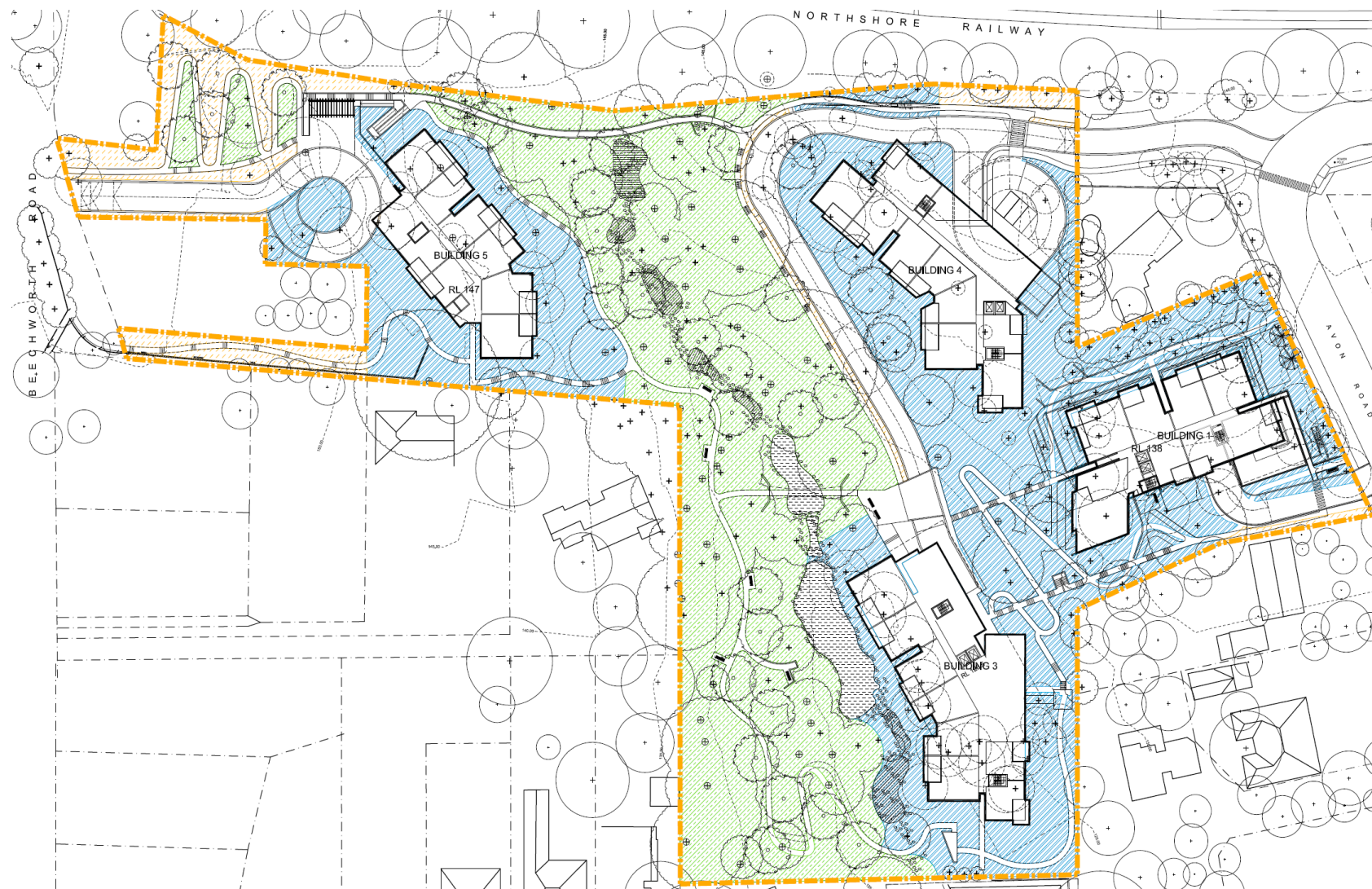
Stage 1 Project Application

Construction of 44 residential apartments over a maximum of six storeys in 'Building 1' and includes the following works:

- Demolition of 1 and 1A Avon Road;
- Excavation to provide one basement car parking level containing 57 spaces;
- Provision of an access road from Avon Road;
- Site landscaping.

Refer to Figure 1 – Site Plan of proposed Residential Complex.

Figure 1 – Site Plan of proposed Residential Complex.



1.3 Statutory Requirements.

This report has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

(a) Environmental Planning and Assessment Act (EPA Act)

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1979* (EPA Act). This Act was amended in August 2002 by the *Rural Fires & Environmental Assessment Legislation Amendment Act, 2002*. In relation to bushfire planning for new residential, rural residential and special fire protection developments in bushfire prone areas in NSW, the following sections of the Act apply:

(i) Section 79BA states:

“Development consent cannot be granted for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bushfire prone land unless the consent authority:

- *Is satisfied that the development conforms to the specifications and requirements of Planning for Bushfire Protection 2006 or:*
- *Has been provided with a certificate by a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment stating that the development conforms to the relevant specifications and requirements”.*

(ii) Section 79C(1) states:

“In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

- *The likely impacts of the development (e.g. natural hazards such as bushfire threat);*
- *The suitability of a site for development (e.g. bushfires)*

(ii) Section 91(1):

Defines the subdivision of bushfire prone land, for residential rural; residential subdivision and the construction of special protection purpose development, as integrated development which requires authorization under Section 100B of the *Rural Fires Act 1997*.

(b) *Rural Fires Act 1997*

The objectives of the *Rural Fires Act* are to provide:

- The prevention, mitigation and suppression of fires;
- Coordination of bushfire fighting and prevention;
- Protection of people and property from fires; and
- Protection of the environment.

In relation to bushfire planning for residential and rural residential subdivision and special fire protection purpose developments in bushfire prone areas in NSW, Section 100B of the Act applies. Section 100B provides for the issue, by the Commissioner of the NSW Rural Fire Service, of a Bushfire Safety Authority for development which creates the subdivision of bushfire prone land for residential and rural residential development and construction of special fire protection purpose developments located within a Bushfire Prone Area.

An application for a Bushfire Safety Authority must be lodged as part of the development application process and must demonstrate compliance with *Planning for Bushfire Protection 2006* and other matters which are considered necessary, by the Commissioner, to protect persons, property and the environment from the impact of bushfire.

In relation to the management of bushfire fuels on public and private lands within NSW, Sections 63(1) and 63(2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimize the danger of, the spread of bushfires.

(c) *Rural Fires Regulation 2008*.

Section 44 of the *Rural Fires Regulation 2008* relates to planning for new residential, rural residential and special fire protection purpose developments in bushfire prone areas in NSW and provides details of the matters that are required to be addressed for the issue of a *Bushfire Safety Authority* under Section 100B of the *Rural Fires Act*.

(d) *Threatened Species Conservation Act 1995 (TSC Act).*

The TSC Act aims to protect and encourage the recovery of threatened species, populations and communities as listed under the Act.

The TSC Act is integrated with the EP&A Act and requires consideration of whether a development or an activity (such as the implementation of hazard reduction and asset protection) is likely to significantly affect threatened species, populations and ecological communities or their habitat.

1.3.2 Planning Policies.

Planning for Bushfire Protection – 2006 (Rural Fire Service).

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for development in bushfire prone areas.

In addition to the provisions of the *Planning for Bushfire Protection 2006* document, the Commissioner may determine, under Section 100B of the *Rural Fires Act*, additional measures for rural residential and residential subdivisions and ‘*Special Fire Protection Purpose*’ development that are considered necessary to protect the development against the impact of bushfire.

1.4 Documentation reviewed in this Assessment.

The following documents were reviewed in the preparation of this report:

- Architectural Plans and Elevations of the proposed residential complex prepared by Marchese Partners;
- Flora & Fauna Assessment prepared by Anne Clements & Associates Pty Ltd;
- Stormwater Management and Riparian Issues report prepared by NPC;
- Site Survey prepared by Higgins Surveyors;
- Traffic Report prepared by Varga Traffic Planning;
- Landscape Plan prepared by Site Image;
- Preferred Project Report prepared by Urbis;
- Aerial Photograph of the development site and adjoining land;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service;

- Australian Standard AS3959 – 2009 - “Construction of Buildings in Bushfire Prone Areas”;
- Rural Fires Act 1997;
- Rural Fires Regulation 2008;
- Ku-ring-gai Council Certified Bushfire Prone Land Map.

1.5 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty Limited* inspected the site on the 24th September 2012 to assess the topography, slopes and vegetation classification within and adjoining the development site.

The inspection also examined the management of the vegetation on the adjoining properties to determine the actual extent of any vegetation within 100 metres of the development site which could lawfully be mapped as being bushfire prone vegetation.

1.6 NSW Rural Fire Service’s Response to Environmental Assessment.

In response to the submission of the Environmental Assessment the NSW Rural Fire Service provided the following advice on bushfire protection matters:

Asset Protection Zones:

At the commencement of the building works and in perpetuity the property around the buildings to a distance of 10 metres to the southwest and the southeast should be maintained as an Inner Protection Area [IPA];

Water and Utilities:

Water electricity and gas are to comply with section 4.1.3 of *Planning for Bushfire Protection 2006*.

Access:

Property access roads to community title developments should comply with section 4.2.7 of *Planning for Bushfire Protection 2006*.

SECTION 2

DESCRIPTION OF DEVELOPMENT SITE

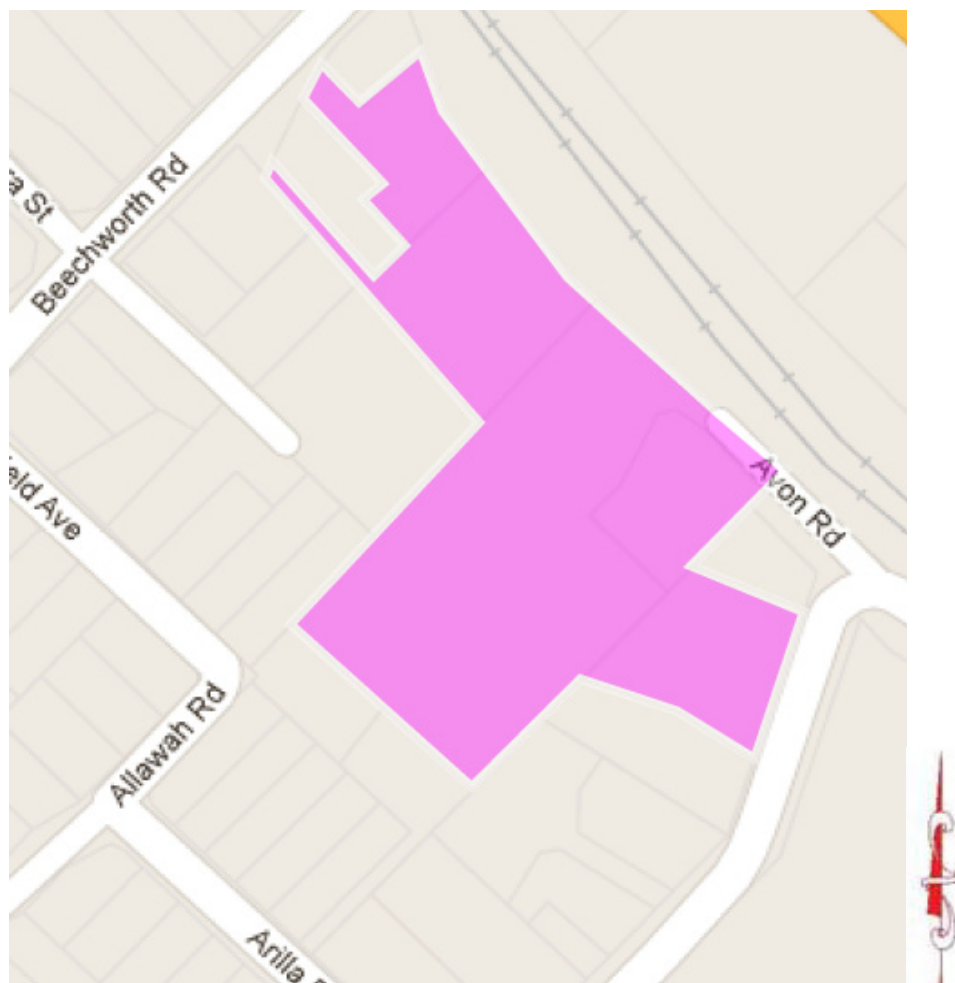
2.1 Location & Description.

The site has a total area of 23,667m² and is known as 1, 1A and 5 Avon Road and 4 Beechworth Road, Pymble within the Ku-ring-gai Local Government Area.

The site is bound by the North Shore Railway Line to the north east, Avon Road to the east, Mayfield Avenue and Beechworth Road to the west and northwest and 1 Arilla Road to the south.

Figure 1 shows the boundaries of the site. It should be noted that since the lodgement of the Concept Application, the site boundary has been amended and 1 Arilla Road (Lot 7 in DP 15541) has now been removed from the site.

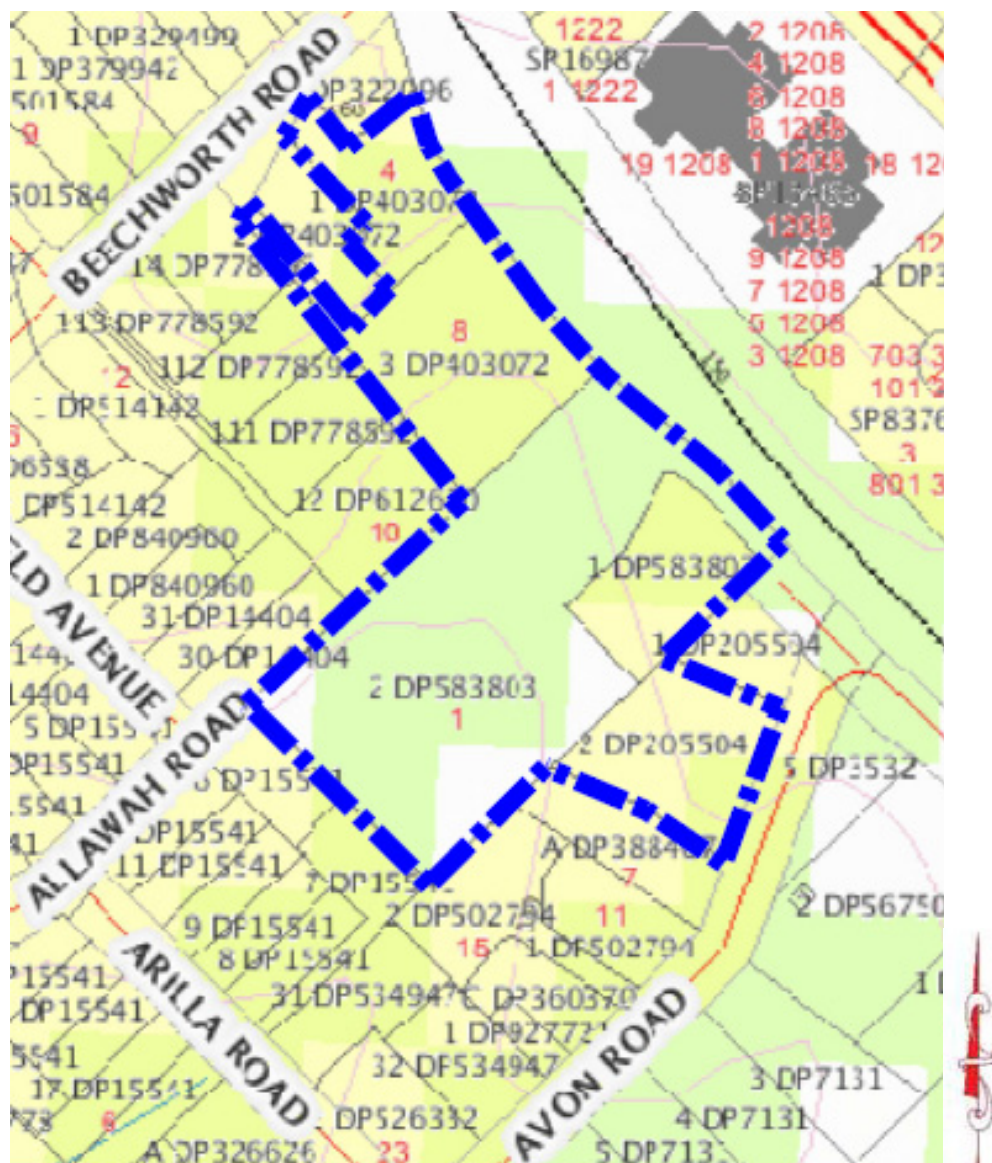
Figure 1 – Location of the Development Site.



The site contains the following lots – refer to Figure 2 – Cadastre Plan:

Lot/DP	Address	Area [m ²]
Lot 1 in DP 583803	1 Avon Road	2,356
Lot 2 in DP 583803	1A Avon Road	11,934
Lot 2 in DP 205504	5 Avon Road	2,807
Lot 1 in DP 403072	4 Beechworth Road	2,067
Lot 2 in DP 403072	8 Beechworth Road	4.503
		Total: 23,667

Figure 2 – Cadastre Plan.

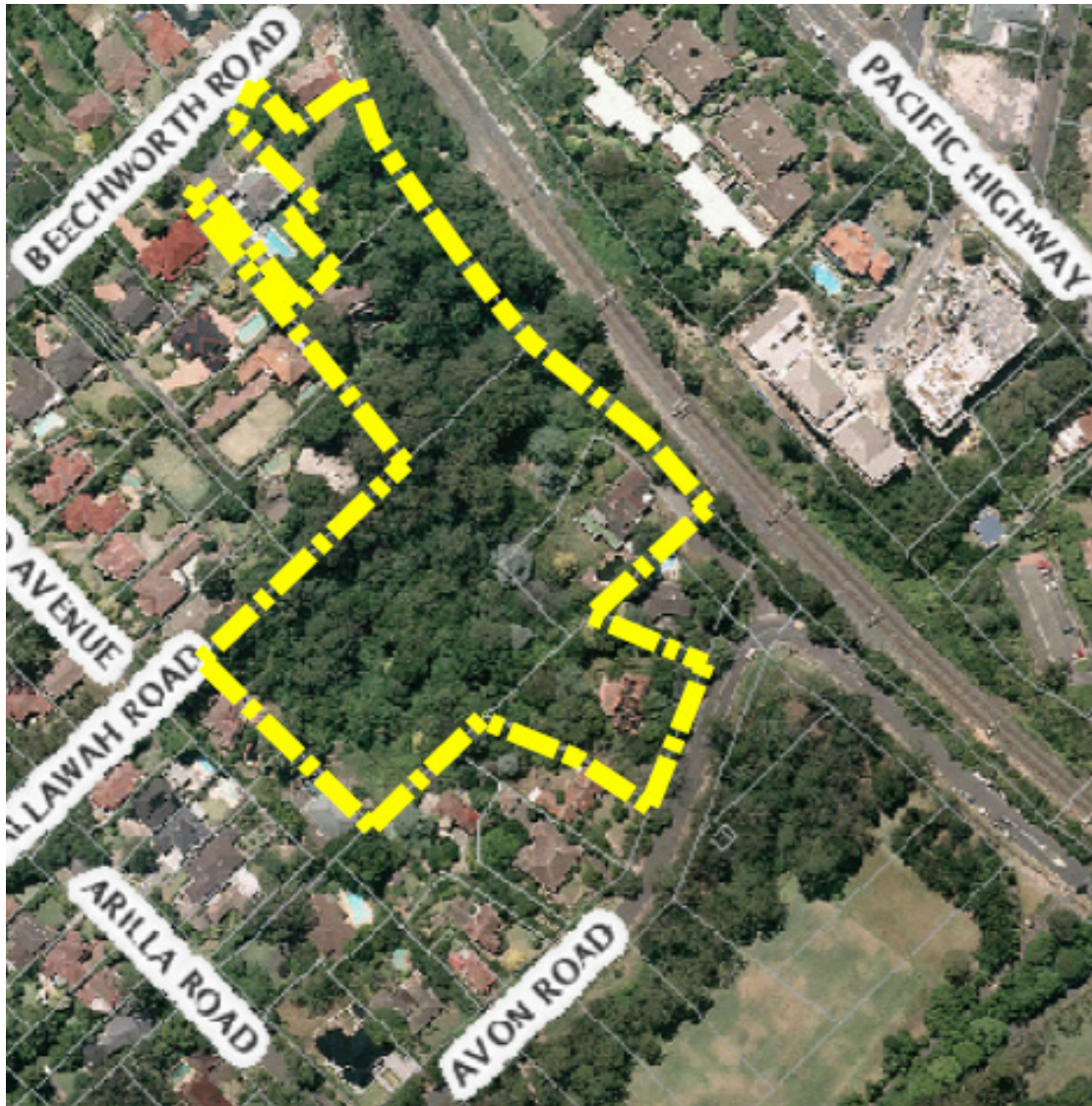


The site is currently occupied by four single or two storey residential dwellings located at No. 1 & 1A Avon Road, No. 5 Avon Road, No. 4 Beechworth Road and No. 8 Beechworth Road. The site has a varying topography and the remainder of the site is heavily vegetated with dense weed infestation. In summary, the site has a number of key attributes as follows:

- The site has variable topography with the centre of the site being the steepest, falling to the east and west. There is also a gradual fall in the topography generally to the south towards Arilla Road;
- A vegetation corridor exists through the centre of the site which is heavily vegetated and contains a number of noxious weeds including Wandering Jew, Lantana and Japanese Honeysuckle. The site also includes the ecologically endangered communities of Sydney Blue Gum High Forest and Sydney Red Gum;
- The site is bisected through the central portion by a small drainage line that runs in a north-south direction which originates from the residential area to the north of the North Shore Railway Line;
- The site is located near the top end of the catchment. The catchment which encompasses the site extends to the ridge line which is the Pacific Highway just to the north of the site. The catchment above the site has a small area of approximately 5 ha;
- The site contains two local heritage items located at 1 and 5 Avon Road. No. 1 Avon Road is also identified as a heritage item under the Draft Kuring-gai Local Environmental Plan (Local Centres) 2012;
- The site has access to Beechworth Road via an access handle running along 6 Beechworth Road.

Refer to Figure 3 – Aerial Photograph below.

Figure 3 – Aerial Photograph showing location of Development Site.



2.2 Adjoining Land Use.

The landuse to the southeast of the development site consists of residential dwellings on single lots with the land to the southeast of Avon Road forming part of the Pymble Ladies College campus. The land adjoining the north-eastern boundary of the development site forms the North Shore Railway corridor with high rise medium density residential development located beyond the Rail corridor.

The remaining aspects of the site are adjoined by residential development – refer to Figure 3 – Aerial Photograph above.

2.3 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour to the site.

a) Within the Development Site.

The land within the development site falls forms the head of a valley which extends to the south through the central portion of the development site. The landform from Avon Road and Beechworth Road falls into the floor of the valley at varying gradients.

b) Within 100 metres of the Development Site.

The land to the north rises to the north at < 5 degrees, beyond the Rail corridor.

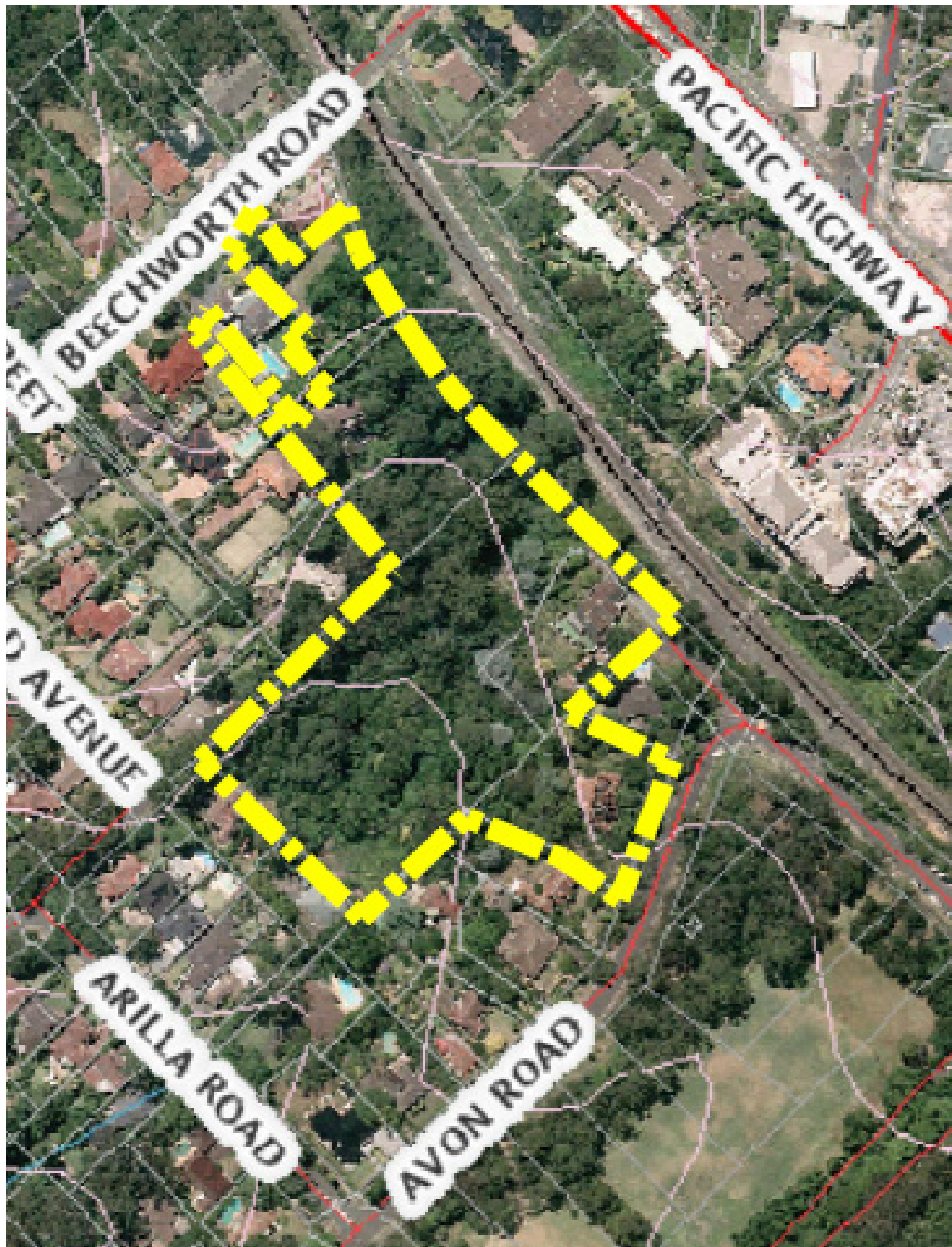
The land to the southeast of the site falls into a gully which extends to the south through the western portion of the Pymble Ladies College Campus. The gully has steep sided narrow banks with the landform leveling to provide a gradient of 5 – 6 degrees across the adjoining land.

The land to the west of the development sites rises across Beechworth Road before falling into the valley to the west.

The land to the south of the development site generally falls to the south whilst following the contours to each side of the valley formation.

Refer to Figure 4 – Aerial Photograph showing Contour levels.

Figure 4 – Aerial Photograph showing contours.



2.4 Vegetation.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the future development on the site. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) *Forests [wet & dry sclerophyll forests];*
- (b) *Woodlands;*
- (c) *Plantations – being pine plantations not native plantations;*
- (d) *Forested Wetlands;*
- (e) *Tall Heaths;*
- (f) *Freshwater Heaths;*
- (g) *Short Heaths;*
- (h) *Alpine Complex;*
- (i) *Semi – arid Woodlands;*
- (j) *Arid Woodlands; and*
- (k) *Rainforests.*

2.4.1 Vegetation within the Development Site.

The development site contains former landscaped gardens located beneath a tree canopy of exotic and native trees.

The vegetation within the former landscape gardens consists of dense weeds including Wandering Jew, Lantana and Japanese Honeysuckle. The tree canopy consists of the ecologically endangered communities of Sydney Blue Gum High Forest and Sydney Red Gum.

2.4.2 Vegetation within 140 metres of the Development Site.

The existing residential development and medium density flat development on the land adjoining the development site contains managed landscaped gardens.

The Ku-ring-gai Bushfire Prone Land Map records the vegetation located within the northwestern corner of the Pymble Ladies College as Category 1 [Forest/Woodland] Bushfire Prone Vegetation.

The site inspection identified that the gully line within the School Campus contains remnant forest vegetation with some parts of the vegetation having a managed understorey. The width of the unmanaged vegetation is less than 50 metres and therefore presents a low level of bushfire risk to the adjoining development – Refer to Figure 5 – Aerial Photograph showing extent of Bushfire Prone Vegetation and Site Photographs below.

Figure 5 – Aerial Photograph showing the extent of Bushfire Prone Vegetation within the Pymble Ladies College, the south east of the Development Site.



2.5 Site Photographs



Photograph No. 1 – Taken from Avon Road looking across the top of the gully within the Pymble Ladies College showing managed vegetation.



Photograph No. 2 – Taken from Avon Road looking southeast across the top of the gully within the Pymble Ladies College showing the unmanaged vegetation.



Photograph No. 3 – Taken from Avon Road looking south showing vegetation in the gully within the Pymble Ladies College.

2.6 Significant Environmental Features within the Development Site.

The land within the development site does not contain significant environmental features such as SEPP 14 Wetlands, SEPP 44 Koala Habitat, SEPP 26 Littoral Rainforests; land slip areas or National Parks Estate; areas of geological interest; steep lands [>18 degrees] or riparian corridors [reference to Stormwater Management & Riparian Issues Report prepared by NPC].

2.7 Known Threatened Species, population or ecological community within the Development Site.

The site contains a small area of remnant Sydney Blue Gum High Forest, located mainly in the floor of the valley. This vegetation community is proposed to be retained and rehabilitated – Refer to Vegetation Management Plan prepared by Anne Clements & Associates Pty Ltd.

The rehabilitation process will limit an increase in the hazardous bushfire fuels within the site with the re-introduction of ‘wet’ species such as ferns and low ground covers/shrubs in the understorey layer.

2.8 Details and location of Aboriginal relics or Aboriginal place.

There are no sites of Aboriginal heritage significance within the proposed development site.

SECTION 3

PRECINCT LEVEL ASSESSMENT

3.1 Introduction.

The Ku-ring-gai Bushfire Prone Land Map records that the south-eastern section of the development site contains the buffer zone to the Category 1 Bushfire Prone Vegetation located on the land within the Pymble Ladies College which occupies the land to the southeast of Avon Road. Figure 6 below is an extract from the Ku-ring-gai Bushfire Prone Land Map showing the Category 1 Bushfire Prone Vegetation and Buffer Zone.

Figure 6 – Extract of the Ku-ring-gai Bushfire Prone Land Map.



Legend: Orange – Category 1 Bushfire Prone Vegetation; Red – 100m wide Buffer Zone to the Category 1 Bushfire Prone Vegetation

The inspection of the development site and adjoining lands confirmed that Category 1 Bushfire Prone Vegetation does exist in the gully located within the Pymble Ladies College, to the extent as shown on the Certified Bushfire Prone Land Map.

SECTION 4

BUSH FIRE PROTECTION ASSESSMENT

4.1 Introduction.

Section 44 of the *Rural Fires Regulation 2008* requires that an application for a *Bushfire Safety Authority* must include a bushfire assessment for the proposed development (including the methodology used in the assessment) that addresses the extent to which the development provides:

- *asset protection zones;*
- *the siting and adequacy of water supplies for firefighting operations;*
- *capacity of public roads to handle increased volumes of traffic during a bushfire emergency;*
- *whether or not public roads link with the fire trail network and have two way access;*
- *the adequacy of access and egress for the purposes of emergency response;*
- *the adequacy of bushfire maintenance plans and fire emergency procedures and;*
- *the construction standards to be used for building elements.*

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones and Bushfire Attack / Construction Standards required for habitable buildings in development for residential purposes that are designated as bushfire prone.

Sections 5.2 and 5.3 of this report use the methodology provided by *Planning for Bushfire Protection 2006* to determine the Asset Protection Zones and construction standards required for the proposed medium density units.

The remaining items identified by Section 44 of the *Rural Fires Regulation 2008* are examined in Sections 5.4 – 5.6 of this report.

4.2 Determination of Asset Protection Zones – Proposed Residential Development.

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones):

- (a) *Determine vegetation formations as follows:*
 - Identify all vegetation in all directions from the site for a distance of 140 metres;
 - Consult Table A2.1 to determine the predominant vegetation type; and
 - Select the predominant vegetation formation as described in Table A2.1.
- (b) *Determine the effective slope of the land under the predominant vegetation Class.*
- (c) *Determine the appropriate fire [weather] area in Table A2.2.*
- (d) *Consult Table A2.4 and determine the appropriate setback [Asset Protection Zone] for the assessed land use, vegetation formation and slope range.*

Table 1 provides a summary of this assessment and the resultant widths of the Asset Protection Zones for the construction of the proposed residential development on the site.

Table 1. Determination of Asset Protection Zones – Residential Development. Fire Danger Index [FDI] for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Width of Asset Protection Zone required by Table A2.4 of Planning for Bushfire Protection 2006	Width of Asset Protection Zone provided to proposed medium density building
<i>Southeast of proposed residential buildings</i>	Dry Sclerophyll Low Open Forest in narrow corridor along watercourse within the Pymble Ladies College to the southeast of Avon Road	Forest reclassified to 'rainforest' due to vegetation being less than 50 metres in width and low fire hazard	10 – 15 degrees downslope within gully	20 metres	More than 25 metres across Avon Road and setback to building

Assessment Results:

The Preferred Project application seeks approval to erect a complex of four multi-storey buildings housing a total of 270 residential units on a site which is shown, on the Ku-ring-gai Bushfire Prone Land Map, to be affected by the 100 metre wide buffer zone to the Category 1 Bushfire Prone Vegetation located in the Pymble Ladies College.

The location of the closest building provides a separation of more than 25 metres to the mapped bushfire prone vegetation located to the southeast of the site, exceeding the minimum width of Asset Protection Zone required by Table A2.4 of *Planning for Bushfire Protection 2006*.

The vegetation within the development site is not recorded as a bushfire hazard on the Bushfire Prone Land Map. However, the development proposal includes the rehabilitation of the existing Blue Gum High Forest on the site. This rehabilitation will include weed removal and replanting of species common to the Blue Gum High Forest community, including ferns and low shrubs.

This retained and rehabilitated pocket of vegetation is not connected to adjoining vegetation which is mapped as bushfire prone vegetation and therefore will remain a low hazard pocket of vegetation.

As a precaution, the proposed buildings have been located so as to provide a 10.00 metre wide landscaped buffer zone between the buildings and the rehabilitated Blue Gum High Forest vegetation.

Note:

A Stormwater Management and Riparian Issues report prepared by NPC has identified that the site does not contain a Prescribed Stream as defined by the Water Management Act and therefore there is no requirement to establish and maintain a Critical Riparian Corridor within the site.

4.3 Assessment of Bushfire Attack (Construction Standards).

The 2010 amendment of Appendix 3 of *Planning for Bushfire Protection 2006* provides the following procedure for determining bushfire attack on a building within a designated bushfire prone area:

- (a) Determine vegetation formation types and sub-formations around the building as follows;

- (i) Identify all vegetation types within 140 metres of the site using Keith [2004];
 - (ii) Classify the vegetation formations as set out in Tables A2.1 in Appendix 2; and
 - (iii) Convert Keith to Specht classifications using Table A3.5 of Appendix 3 [2010].
- (b) Determine the separation distance between each vegetation formation and the structure;
- (c) Determine the effective slope of the ground for each vegetation group;
- (d) Determine the relevant Fire Danger Index [FDI] for the Council area from Table A2.3 in Appendix 2;
- (e) Match the relevant FDI, appropriate vegetation, distance and effective slope to determine the bushfire attack levels using the relevant tables of A.S.3959 – 2009 as indicated below:
 - (i) FDI 100 – Table A2.4.2;
 - (ii) FDI 80 – Table A2.4.3; and
 - (iii) FDI 50 – Table A2.4.4.

Proposed Building No. 1 has a separation of more than 25 metres to the bushfire prone vegetation mapped within the Pymble Ladies College. The vegetation is deemed to be low risk due to the width of the corridor and the effective slope of the land within the watercourse that contains the bushfire prone vegetation has been determined to be 10 – 15 degrees.

From Table 2.4.2 of Australian Standard A.S. 3959 – 2009 – ‘*Construction of Buildings in Bushfire Prone Areas*’ this separation width reduces the level of radiant heat exposure on Building No. 1 to less than 29kW/m². Therefore it is recommended that the south-eastern elevation of this building shall be constructed to comply with BAL 29, pursuant to the specifications provided by A.S. 3959 – 2009 and that all remaining elevations comply with BAL 19, pursuant to the specifications provided by A.S. 3959 – 2009.

All remaining buildings within the proposed development are located beyond the 100 metre wide buffer zone to the bushfire prone vegetation and therefore outside the requirement to provide bushfire construction standards pursuant to Part 2.3.4 of the Building Code of Australia and A.S. 3959 – 2009 – ‘*Construction of Buildings in Bushfire Prone Areas*’.

4.4 Access Standards for Firefighting Operations.

4.4.1 Adequacy of Public Roads.

The proposed development has vehicular and pedestrian access onto Avon Road and Beechworth Road which are local roads maintained by KU-ring-gai Council. These roads are capable of catering for additional traffic during bushfire emergencies in the local area.

4.4.2 Fire Trail Access to two-way Public Roads.

The proposed development does not require the provision of fire fighting access trails.

4.4.3 Emergency Response Access / Egress.

Emergency access and egress to the proposed development is provided off Avon Road and Beechworth Road via 6.5 metre wide internal driveways.

The NSW Rural Fire Service's advice is that the internal road network should comply with Section 4.2.7 of *Planning for Bushfire Protection 2006*.

The deemed to satisfy provisions of Section 4.2.7 state:

1. Internal Roads are two wheel drive, sealed all-weather roads:

Comment:

The proposed internal access driveways are two wheel drive, sealed all-weather roads.

2. Internal perimeter roads are provide with at least two traffic lane widths:

Comment:

There are no internal perimeter roads proposed.

3. Roads are through roads. Dead ends roads are not more than 100 metre in length from a through road, incorporate a minimum 12m outer radius turning circle and are clearly sign posted as a dead end:

Comment:

The internal access driveways are longer than 100 metres however the buildings that the internal driveway network service are not exposed to a risk from bushfire.

The capacity to turn fire appliances within the site has been designed into the driveway layout with turning heads or turning circles provided for Fire & Rescue Urban Pumper type appliances.

4. Traffic management devices are constructed to facilitate access by emergency services vehicles.

Comment:

Noted.

5. A minimum vertical clearance of four metres to any overhanging obstructions, including trees branches, is provided:

Comment:

Tree limbs to be trimmed where necessary and vertical clearance of four metres provided where access is to be provided within the building footprints.

6. Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress:

Comment:

The driveway design limits the number of corners and provides for a minimum 6.0 metre inner radius to the corners. Outer radius has been designed to permit a fire appliance and a B9 vehicle to pass on the corners.

7. The inner distance between the inner and outer curves is six metres:

Comment:

Outer radius has been designed to permit a fire appliance and a B9 vehicle to pass on the corners, therefore satisfying this requirement.

8. Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees; Cross fall of the pavement is not more than 10 degrees:

Comment:

These design requirements have been met.

9. Roads do not traverse through wetlands or other land potentially subject to periodic inundation:

Comment:

This requirement is not relevant to this application.

10. Roads are clearly sign-posted and bridges clearly indicate load ratings:

Comment:

This requirement is not relevant to this application.

11. The internal road surfaces and bridges have a carrying capacity to carry fully-loaded fire-fighting vehicles [15 tonnes]"

Comment:

This requirement is noted.

4.5 Water Supplies for Firefighting Operations.

A reticulated water supply is available to the site from a main located in Avon Road and Beechworth Road. The proposed development will provide for the extension of this service into the building in order to provide a fire-fighting water service to each floor of the building to address the provisions of A.S 2419.1 – 2005.

A hydrant booster assembly shall be provided inside the boundary and adjacent to the entry driveway off Avon Road.

A similar arrangement shall be provided to service the fire fighting water supplies to Building No. 5, with access from Beechworth Road.

4.6 Utility Services – Electricity & Gas Supplies.

Electricity and gas services to the development site will be supplied from mains in Avon Road and Beechworth Road. Internal provision of these utility services will be underground.

4.7 Bushfire Hazard Management.

The design and maintenance of the landscaped gardens, including the prescribed ten [10.00] metre buffer zone, to the complex shall comply with the prescriptions of an Inner Protection Area [IPA] pursuant to the specifications of Appendix 5 of *Planning for Bushfire Protection 2006* and the NSW Rural Fire Services document '*Specifications for Asset Protection Zones*'.

4.8 Emergency Management for Fire Protection.

Due to the low bushfire risk to the proposed development there is no requirement for the preparation of a Bushfire Emergency Management Plan.

4.9 Adequacy of Sprinkler Systems & other Fire Protection Measures.

There are no bushfire sprinkler systems required or recommended.

4.10 Evacuation.

The residential complex has been designed to provide vehicular access to the basement car parks from Avon Road and Beechworth Road and pedestrian access to the buildings via internal lifts and walkways.

The vehicular access/egress provisions combined with internal pedestrian access via lifts and walkways to the public road network addresses the provision of safe egress from the site.

However, there shall be prepared and incorporated into the Community Management Plan, an Evacuation Plan which incorporates protocols for defined emergencies. The Evacuation Plan shall be prepared in accordance with Australian Standard A.S. 3745-2002 *“Emergency Control Organisation and Procedures for dwellings, structures and workplaces”* and will remain in draft format until completed by the Management Committee.

SECTION 5

BUSHFIRE MANAGEMENT STRATEGIES

Strategies to address the aim and objectives of *Planning for Bushfire Protection 2006* are as follows:

Strategy 1 – Landscape Management:

The design and maintenance of the landscaped gardens to the complex, including the 10.00 metre wide buffer zone to Buildings 3, 4 & 5, shall comply with the prescriptions of an Inner Protection Area [IPA] pursuant to the specifications of Appendix 5 of *Planning for Bushfire Protection 2006* and the NSW Rural Fire Services document '*Specifications for Asset Protection Zones*'.

Strategy 2 – Bushfire Construction standards to Building No. 1.

The south-eastern elevation to proposed Building No. 1 shall be constructed to comply with BAL 29 specifications pursuant to A.S. 3959 – 2009 – '*Construction of Buildings in Bushfire Prone Areas*'.

All remaining elevations to this building shall be constructed to comply with BAL 29 specifications pursuant to A.S. 3959 – 2009 – '*Construction of Buildings in Bushfire Prone Areas*'.

Strategy 3 – Bushfire Construction standards to Buildings No. 3, 4 & 5.

There is no requirement for the application of bushfire construction measures to Buildings No. 3, 4 & 5.

Strategy 4 – Water Supplies for Firefighting Operations:

The existing Sydney Water reticulated service shall be extended into the development site with hydrants installed in accordance with A.S. 2419.1 – 2005.

A hydrant booster assembly shall be provided inside the boundary and adjacent to the entry driveway off Avon Road.

A similar arrangement shall be provided to service the fire fighting water supplies to Building No. 5, with access from Beechworth Road.

Strategy 5 – Access for fire-fighting appliances:

The minimum pavement width of the internal driveways shall be 6.5 metres. Corners shall be designed to permit a Fire & Rescue Urban Pumper [Heavy Rigid Vehicle] and a B9 vehicle to pass and turning facilities shall be provided to enable fire appliance egress from the site in a forward direction.

Strategy 5 – Evacuation Plan:

There shall be prepared and incorporated into the Community Management Plan, an Evacuation Plan which incorporates protocols for defined emergencies.

The Evacuation Plan shall be prepared in accordance with Australian Standard A.S. 3745-2002 “*Emergency Control Organisation and Procedures for dwellings, structures and workplaces*” and will remain in draft format until completed by the management committee.

SECTION 6

CONCLUSION

This report has been prepared to address the Preferred Project Requirements for the Major Project Application – Avon and Beechworth Roads at Pymble.

The Department of Planning and Infrastructure letter dated 19.4.2011 in reference to Concept Plan [MP08_0207] and Project Application [MP10_0219] – Residential development at Avon, Beechworth and Arilla Roads, Pymble identified under Schedule 1 – Key Issues bushfire protection matters which should be addressed in the modified Preferred Project Application.

These included a more coordinated analysis of the capacity of the site in a single document, with particular reference to the submissions from Department of Environment Climate Change and Water (DECCW), NSW Office of Water (NOW), Rural Fire Services (RFS) and Kuring- gai Council. This further analysis may require a review of the submitted Flora and Fauna Assessment, Vegetation Management Plan (VMP), and Landscape Masterplan, and should map the required bushfire Asset Protection Zone (APZ) and the required CRZ on one diagram together with the location of building footprints and other key infrastructure such as drainage works and pathways.

The PPR should also address the inconsistencies between the Flora and Fauna Assessment, VMP, Bushfire Assessment and Landscape Masterplan identified by Agency submissions.

A co-ordinated assessment of the riparian corridor matters, ecological constraints, landscape design and bushfire protection measures has been undertaken which has resulted in a modified layout that provides for the retention and rehabilitation of the Blue Gum High Forest on the site, provision of a 10.00 metre wide precautionary buffer zone [Defendable Space] between proposed Building No. 3, 4 and 5 and the retained Blue Gum High Forest and a landscape design that provides a managed curtilage to the proposed buildings which satisfies the performance requirements of an Inner Protection Area [IPA] - as required by the NSW Rural Fire Service.

This report also examines the bushfire risk to the development from the mapped Category 1 Bushfire Prone Vegetation shown on the Ku-ring-gai Bushfire Prone Land Map to be located within the adjacent Pymble Ladies College and has found that the separation width exceeds the minimum width recommended in *Planning for Bushfire Protection 2006*.

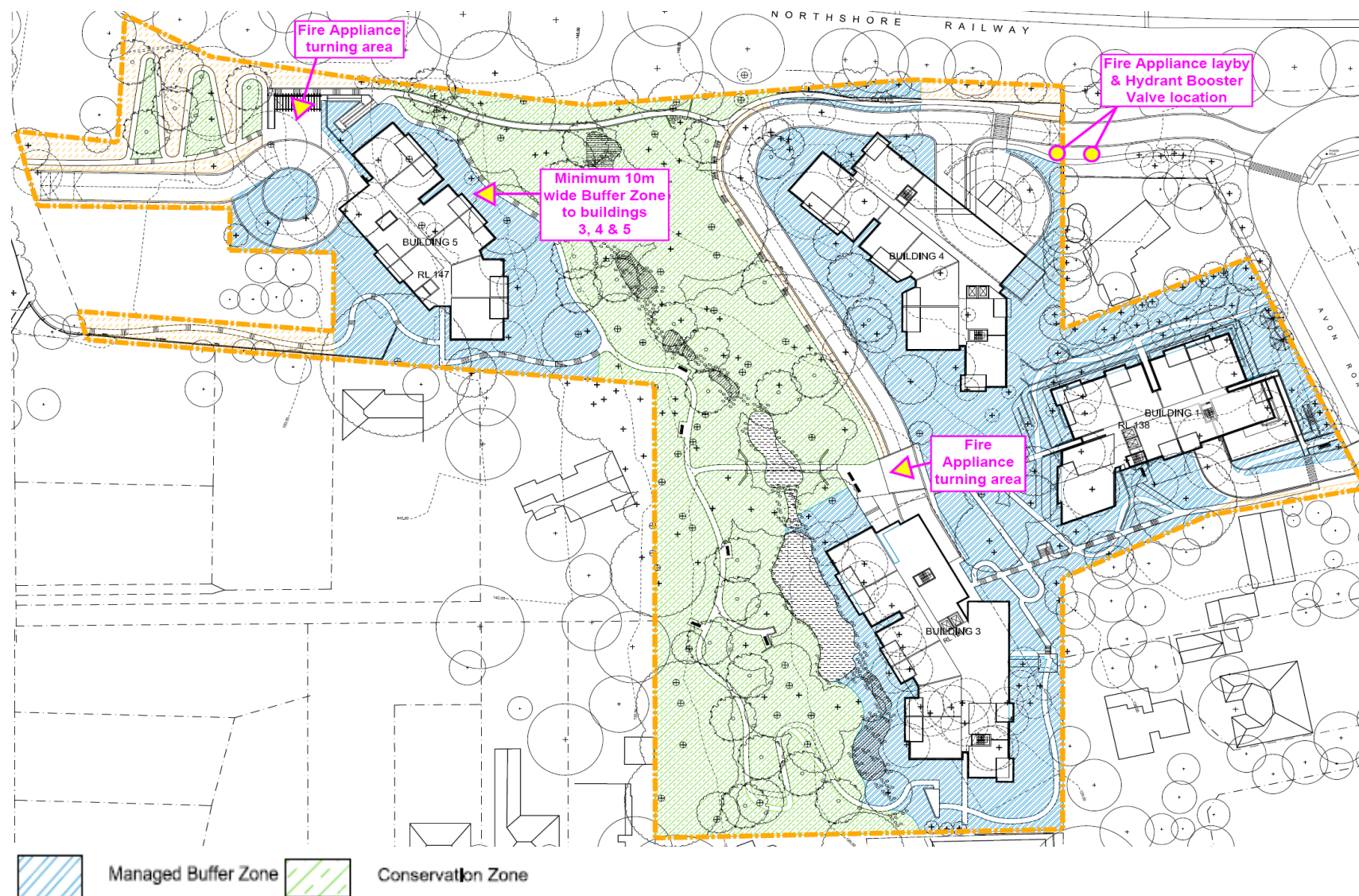
The level of exposure to radiant heat from a fire in the vegetation within the Pymble Ladies College has been assessed and recommendations made on the bushfire construction standards to be applied to Building No. 1. Buildings 3, 4 & 5 do not require the application of bushfire construction standards as they are located more than 100 metres from the mapped Category 1 Bushfire Prone Vegetation.

The report also examines the requirements for fire-operational access and water supplies and confirms that the modified layout satisfies the specifications for emergency access/aggress within the site.



Graham Swain
Managing Director,
Australian Bushfire Protection Planners Pty Limited.

SECTION 7 – Plan of Buffer Zone to proposed Building No. 1 and Buffer Zone to Buildings 3, 4 & 5.



REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- N.S.W Rural Fire Service – Threatened Species Hazard Reduction List for the Bushfire Environmental Code (2003);
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires and Environmental Assessment Legislation Amendment Act 2002*;
- *Rural Fires Regulation 2008*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2006*;
- *Threatened Species Conservation Act 1995*;
- *Native Vegetation Act*;
- *Bushfire Environmental Assessment Code 2006*;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Ku-ring-gai Bushfire Prone Land Map*.