

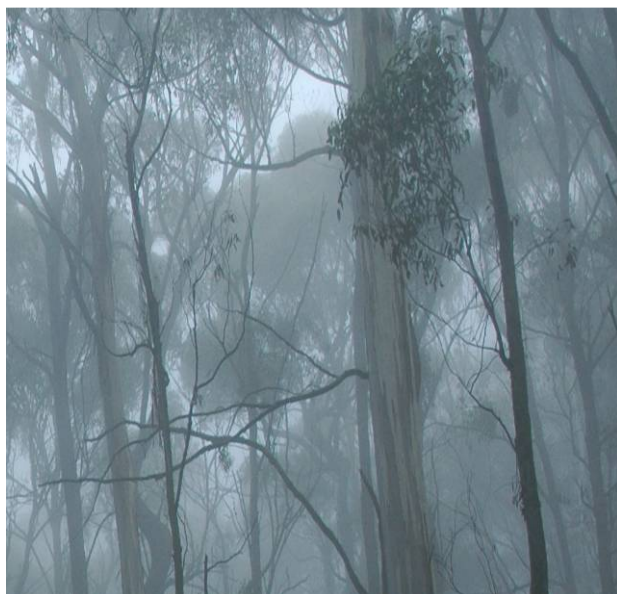


Bushfire Protection Assessment

Aged Care and Retirement Living Development – South Dural Precinct 1
(South), Old Northern Road, South Dural

Prepared for
APP Corporation Pty Ltd

29 November 2017



DOCUMENT TRACKING

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1 Property and proposal

Name:	South Dural Precinct 1 (South)		
Street or property name:	Old Northern Road		
Suburb, town or locality:	South Dural	Postcode:	2158
Lot and DP:	Lot 6 & 7 DP 231126; Lot B DP 158479		
Local Government Area:	The Hills Shire Council		
Type of area:	Urban / Rural Residential		
Type of development:	Special Fire Protection Purpose (Residential Aged Care and Independent Retirement Living)		

1.1 Introduction

APP Corporation Pty Ltd (client) commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for the proposed development of South Dural Precinct 1 (South), situated at Old Northern Road, South Dural (hereafter referred to as the subject land).

The subject land was inspected on multiple occasions in mid-2016 as part of larger Rezoning / Planning Proposal project.

1.2 Location and description of subject land

The subject land is located within the southern portion of Dural, as shown **Figure 1**. **Figure 2** demonstrates the proposed development layout whilst **Figure 3** show the subject land and the location of the proposed development in relation to the Council's bush fire prone land mapping. The subject land has existing rural-residential development to the north and south and abuts an expanse of bushfire prone vegetation within private lands to the west and east, adjacent to Georges Creek.

1.3 Proposed development

The development proposal is classified as a Special Fire Protection Purpose (SFPP) development in accordance with *Planning for Bush Fire Protection 2006* (RFS 2006) for Residential Aged Care and Independent Retirement Living and consists of the following works:

- Demolition of existing residential structures and associated outbuildings;
- Construction of a new 3 storey, 130 bed, Residential Aged Care Facility (RACF);
- Construction of new Independent Living Units (ILUs) – Apartments (36);
- Construction of new Independent Living Units (ILUs) – Dwellings (44);
- Construction of new access roads;
- Associated pathways, landscaping and stormwater management works; and
- Implementation of the required Asset Protection Zones (APZs).

Note: The current proposal footprint will require some modification to achieve all of the acceptable solution requirements for SFPP development in accordance with *Planning for Bush Fire Protection*.



Figure 1: Location of Subject Site – South Dural Precinct 1 (South)

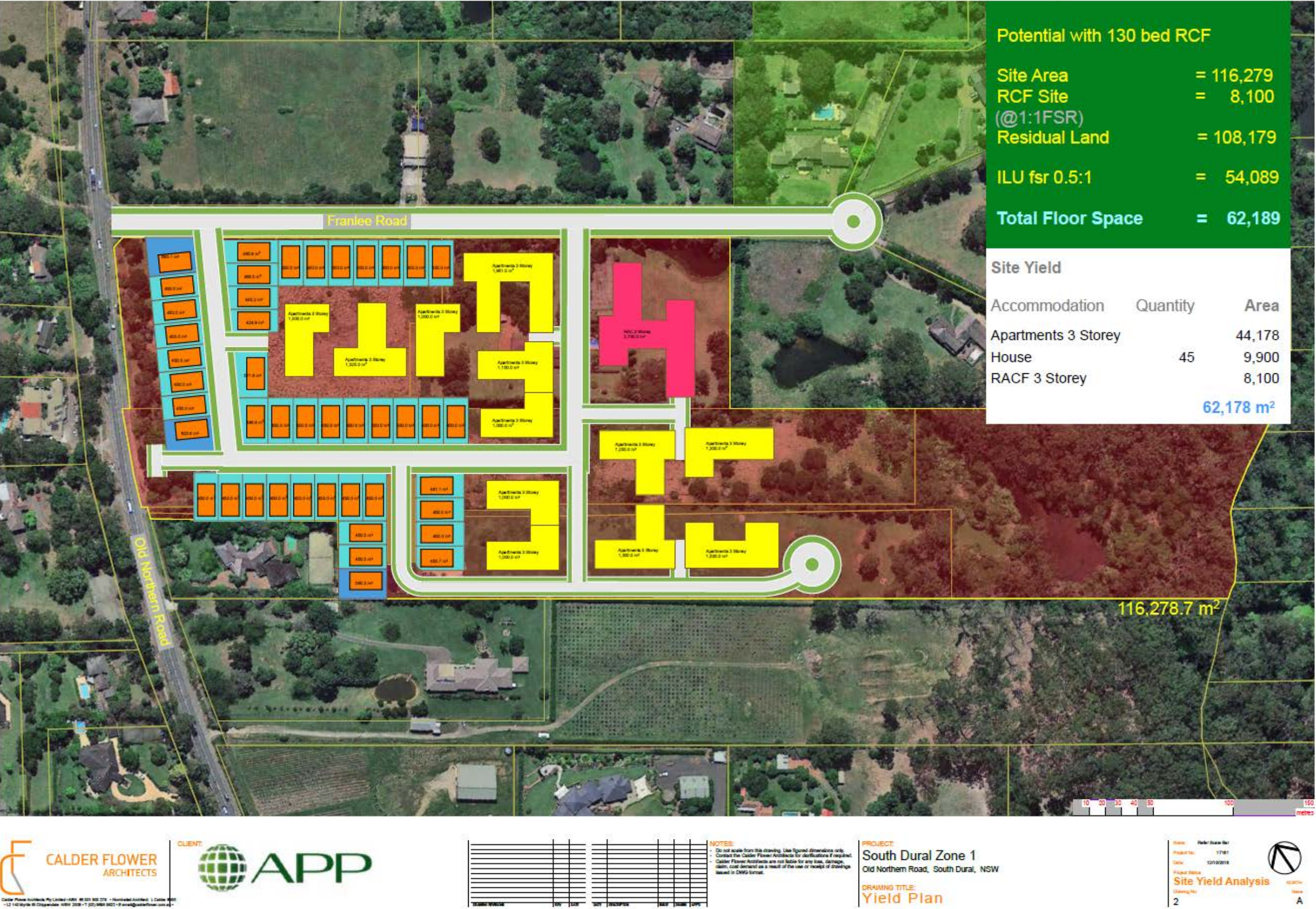


Figure 2: South Dural Precinct 1 (South) Aged Care and Retirement Living –Site Plan

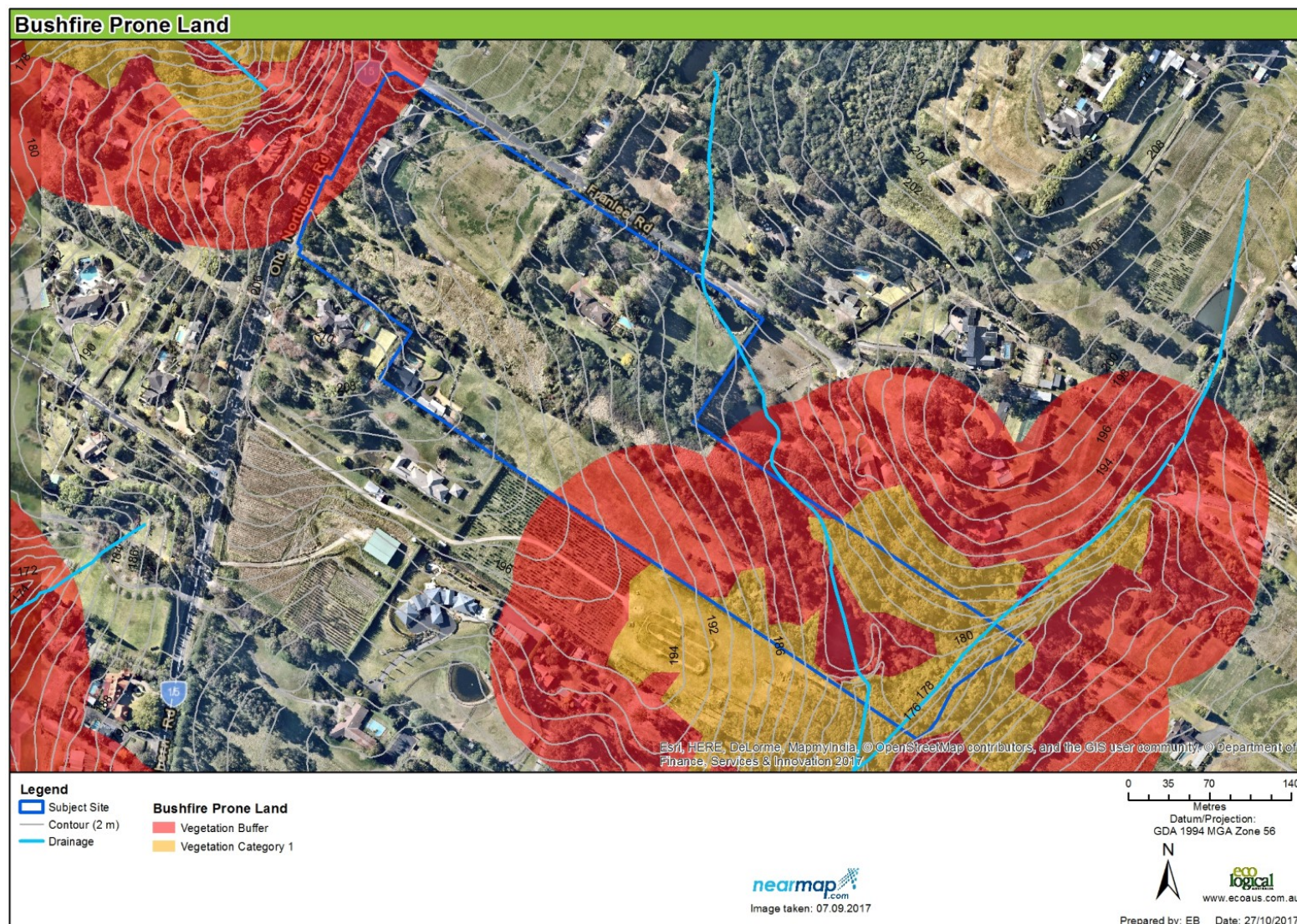


Figure 3: South Dural Precinct 1 (South) Aged Care and Retirement Living - Bush Fire Prone Land (extract from The Hills Shire Council mapping)

2 Bushfire threat assessment

In accordance with Section 91 of the *Environmental Planning & Assessment Act 1979*, the proposed development is integrated development. The following assessment is therefore prepared in accordance with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2013*, and *Planning for Bush Fire Protection 2006* (RFS 2006) herein referred to as PBP.

2.1 SFPP objectives

The proposal is a Special Fire Protection Purpose (SFPP) development. SFPP developments are treated and assessed differently to other developments, and they require a higher standard of bushfire protection due to one or more of the following reasons:

- Occupants may not originate from the area and therefore may be less educated in relation to bushfire impacts;
- They may have a reduced capacity to evaluate risk and respond adequately to the bushfire threat;
- They may be more vulnerable to stress arising from bushfire threat; and
- They may present logistical difficulties for evacuation, due to reduced mobility, larger numbers of people, communication barriers and the requirement for increased supervision.

The PBP specific objectives for SFPP development are to:

- *Provide for the special characteristics and needs of occupants. Unlike residential subdivisions, which can be built to withstand the fire event, enabling occupants and firefighters to provide property protection after the passage of fire, occupants of SFPP developments may not be able to assist in property protection. They are more likely to be adversely affected by smoke or heat while being evacuated*
- *Provide for safe emergency evacuation procedures. SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bushfire threats. During emergencies, the risk to firefighters and other emergency services personnel can be high through prolonged exposure, where door-to-door warnings are being given and exposure to the bushfire is imminent.*

Additionally, the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* outlines bushfire assessment requirements under Clause 27. The requirements are related to achieving compliance with PBP, RFS requirements and consideration of factors that can influence safe evacuation.

2.2 Vegetation types

In accord with PBP, the predominant vegetation class has been assessed both within the subject land and adjacent land to the east (the only external hazard).

Forest is located to the north, east and south-east and is fragmented by moderate to steep topography and rocky outcrops. The Forest extends further to the south-east and south in the gully areas associated with Georges Creek. In accordance with PBP this vegetation is classified as 'forest'.

Two small 'fingers' of vegetation to the east and south-east have been classified as 'Low Hazard' based on their narrow width and a potential fire run being limited to less than 50 m in the identified direction (**Figure 4**).

In all other directions is existing managed land in the form of rural-residential development.

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 from the boundary of the proposed development where the vegetation was found. This assessment was made with a topographic map with 2 m contours and confirmed during a site inspection. The slope assessment is detailed below in **Table 1**.

3 Asset Protection Zones

3.1 APZ Requirements

PBP has been used to determine the width of Asset Protection Zones (APZ) for the proposed development, using the vegetation and slope data identified in **Table 1**. The acceptable solution APZ dimension for a new SFPP development is also shown in **Table 1**).

The required APZs for the proposed development are shown within **Figure 4** and it demonstrated that the current design and location of the RACF and southern most ILU falls within the required APZ. The proposed development footprint will require alteration to remove these buildings from the required SFPP APZ and achieving < 10 kW/m² radiant heat exposure.

Table 1: Threat assessment, APZ and category of bushfire attack

Direction	Slope ¹	Vegetation ²	PBP required SFPP APZ ³ to achieve 10 kW/m ²	Proposed APZ	Comment
North	Upslope / Flat	Forest	60 m	≥65 m	APZ provided by existing cleared rural-residential land and Franlee Road
East / South-east (Georges Creek)	Upslope / Flat	Forest	60 m	≥60 m	APZ provided within property boundaries. APZs positioned within steep lands are subject to implementation and management in accordance with the relevant VMP.
	>5-10° downslope		85 m	≥1000 m	
East / South-east (Finger / Corridor Vegetation)	>5-10° downslope	Low-hazard (Rainforest)	50 m	≥60 m	Additional APZ easements can be provided within surrounding rural-residential lots due to the approved rezoning – these lots will be developed in the near future.
All other directions	Consists of managed lands within neighbouring rural residential development and public roads.				

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

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

³ Assessment according to Table A2.6 of PBP

3.2 APZ maintenance plan

Where the APZ is to be established, or any future landscaping is proposed, the following fuel management specifications to Inner Protection Area (IPA) standards applies as follows:

- a) No tree or tree canopy is to occur within 2 m of the future building rooflines;
- b) The presence of a few shrubs or trees in the APZ is acceptable provided 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 future buildings by direct flame contact or radiant heat emission.
- c) Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- d) 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
- e) Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

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

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

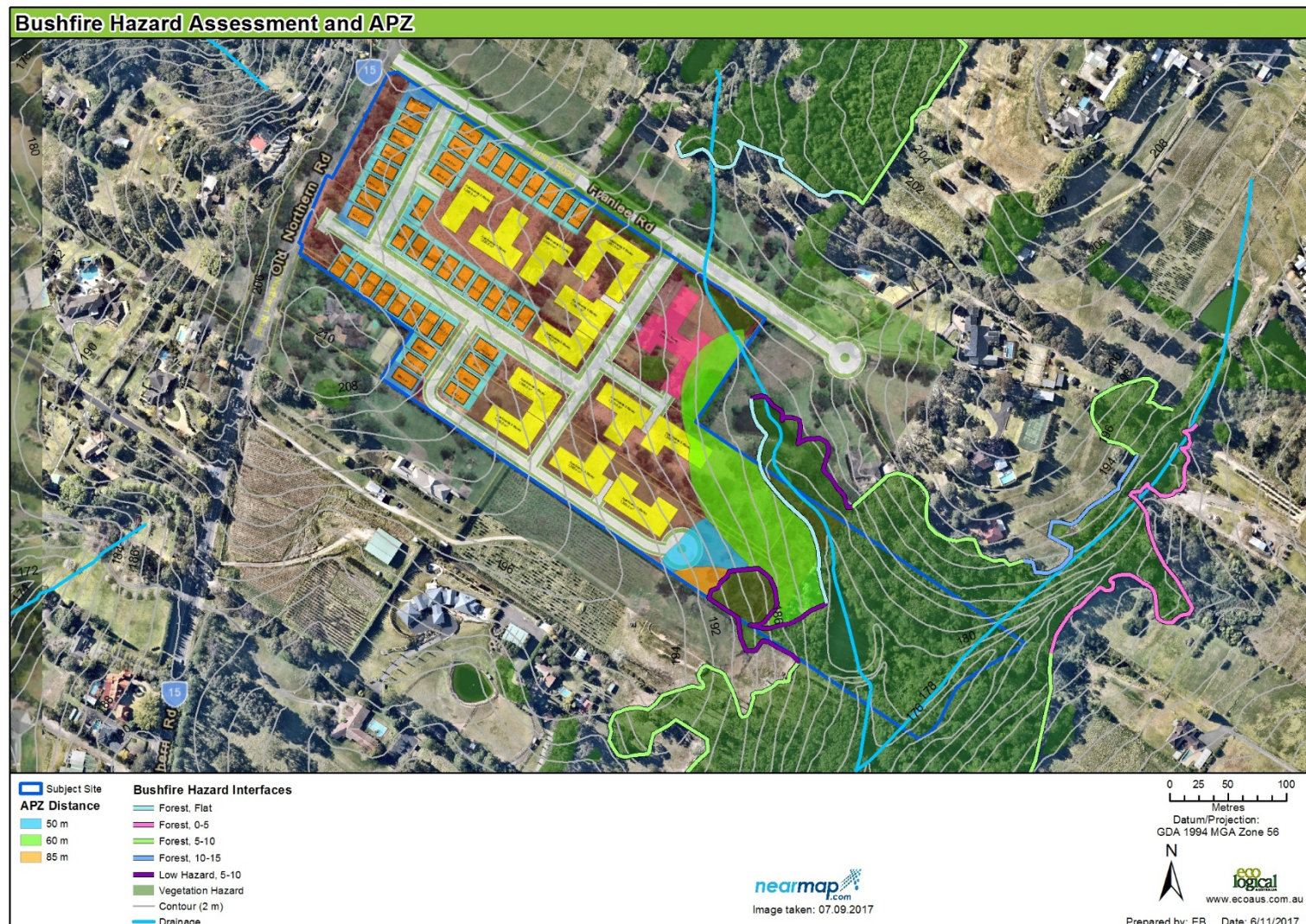


Figure 4: Bushfire Hazard Assessment for proposed Aged Care and Retirement Living

4 Construction standards

Method 1 of AS 3959-2009 *Construction of buildings in bushfire-prone areas* (AS 3959) has been used to determine the bushfire construction levels required for the development. The BALs have been mapped from the eastern / south-eastern boundary (see **Figure 5**).

In response to the predicted bushfire attack, the proposed Aged Care and Retirement Living buildings in closest proximity to the bushfire hazard areas to the east and south east, are required to be constructed to a maximum Bushfire Attack Level (BAL) of **BAL-12.5** based on achieving SFPP construction requirements. **Figure 5** identifies one of the proposed ILU buildings falls within BAL-19 and therefore the proposed development footprint requires modification to ensure all buildings achieve BAL-12.5 as a maximum.

Furthermore the NSW variation to AS 3959-2009 as outlined within Section A3.7 of the NSW Rural Fire Service document Planning for Bush Fire Protection 2006 Appendix 3 Addendum 2010 shall also be applied to the construction as required.



Figure 5: Bushfire Attack Levels (BALs) for proposed Aged Care and Retirement Living (as per AS 3959-2009)

5 Utilities and access

5.1 Water supply

Reticulated water is available along Old Northern Road to the west and Franlee Road to the north. The reticulated water supply network is proposed to be extended and upgraded as required as part of the development proposal.

The reticulated water supply is to comply with the following acceptable solutions within Section 4.2.7 of PBP:

- a) access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads;
- b) Fire hydrant spacing, sizing and pressures comply with *AS 2419.1-2005 Fire hydrant installations – System design, installation and commissioning*. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles; and
- c) The [PBP] provisions for parking on public roads (as contained within section 4.1.3) are met. For road widths of 8m this includes, but is not limited to, having no parking permitted on the side of the road where services (i.e. hydrants) are located.

5.2 Gas and electrical supplies

The electricity supply to the subject land is required to be located underground which complies with PBP (Section 4.2.7).

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas* (Standards Australia 2014).

5.3 Access

Public road access to the proposed development is available directly via Old Northern Road to the west and Franlee Road to the north.

All new proposed access roads within the development are required to meet the acceptable solutions or relevant PBP performance criteria as identified in **Table 2**. The current proposed design requires modification to provide perimeter access to the identified bushfire hazard (south-east) and removal of cul-de-sacs that are great than 100 m from a through road.

Table 2: Performance criteria for internal roads

The intent may be achieved where	Acceptable Solutions
<ul style="list-style-type: none">Internal road widths and design enable safe access for	<ul style="list-style-type: none">internal roads are two-wheel drive, sealed, all-weather roads;

The intent may be achieved where	Acceptable Solutions
<p>emergency services and allow crews to work with equipment about the vehicle.</p>	<ul style="list-style-type: none"> 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;
	<ul style="list-style-type: none"> 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;
	<ul style="list-style-type: none"> traffic management devices are constructed to facilitate access by emergency services vehicles.
	<ul style="list-style-type: none"> a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided. Tree crown lifting works to be undertaken in accordance with <i>Australian Standard: 4373 Pruning of Amenity Trees (2007)</i>.
	<ul style="list-style-type: none"> curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.
	<ul style="list-style-type: none"> the minimum distance between inner and outer curves is six metres.
	<ul style="list-style-type: none"> maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.
	<ul style="list-style-type: none"> crossfall of the pavement is not more than 10 degrees.
	<ul style="list-style-type: none"> roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).
	<ul style="list-style-type: none"> the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

6 Emergency management procedures

The preparation of bushfire emergency procedures for the South Dural Aged Care and Retirement Living development is the responsibility of the management. As such an emergency/evacuation plan is required consistent with the NSW Rural Fire Service *Guide to developing a Bush Fire Emergency Management and Evacuation Plan*. This should be prepared prior to the bushfire season to ensure the Village has appropriate emergency management procedures in place.

Staff employed at Village are to be trained in the implementation of the Emergency Management and Evacuation Plan to satisfy the RFS requirements.

7 Recommendations and conclusion

7.1 Recommendations

The following recommendations have been made within this report to ensure the proposed Retirement Living development is compliant with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2013*, and 'Planning for Bush Fire Protection 2006' (RFS 2006).

The following recommendations apply:

- Recommendation 1:
 - Asset Protection Zones (APZs) are provided as per **Section 3** of this report and as detailed within **Table 1** and **Figure 4**.
 - ***The current proposal design requires modification to ensure no buildings are located within the designated 10 kW/m² APZ required for SFPP development;***
- Recommendation 2:
 - Landscaping to comply with the objectives of an IPA as described by PBP;
- Recommendation 3:
 - Construction works shall comply with the relevant BAL as per AS 3959-2009 with the maximum BAL-12.5 achieved within the subject land;
 - The NSW variation to AS 3959-2009 (Section A3.7 of PBP 2006 Appendix 3 Addendum 2010) shall also be applied to the construction as required;
 - ***The design submitted with a Development Application will be modified to ensure no buildings require a construction level of greater than BAL-12.5 (see Figure 5);***
- Recommendation 5:
 - Water supply requirements, in relation to the proposed reticulated hydrant water supply, should be installed throughout the proposed development in accordance with **Section 5.1** of this report, Section 4.2.7 of PBP 2006, and Australian Standard AS 2419.1;
- Recommendation 5:
 - Electrical supply shall be located underground ;
- Recommendation 6:
 - Gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (Standards Australia 2014);
- Recommendation 7:
 - Access roads shall comply with the specifications identified in **Section 5.3** of this report;
 - ***The design submitted with a Development Application will be modified to provide perimeter access to the identified bushfire hazard (south-east) and removal of cul-de-sacs that are great than 100 m from a through road; and***
- Recommendation 8:
 - An Evacuation / Emergency Management Plan is to be prepared as per **Section 6** of this report.

7.2 Conclusion

In the author's professional opinion, once the proposed design meets the bushfire protection requirements listed in this assessment, it will provide an adequate standard of bushfire protection for the proposed development, a standard that is consistent with the intent of *Planning for Bush Fire Protection 2006*.

If further information is required, please contact Daniel Copland on 4302 1220.



Daniel Copland

Senior Bushfire Consultant

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