



Bushfire Assessment

Proposed Seniors Living

**Lot 602 DP177714 Lakewood
Drive, Merimbula**

Justice Fox

30 June 2020

(Ref: 21159)

report by
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BPAD LEVEL 3 ACCREDITED PRACTITIONER

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1 Introduction

Street or property name:	Lakewood Drive		
Suburb, town or locality:	Merimbula	Postcode:	2548
Lot/DP no:	Lot 620 DP 1277714		
Local Government Area:	Bega Valley Shire Council		
Type of development:	Special Fire Protection Purpose (SFPP)		

1.1 Background

Justice Fox commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to inform and support a proposal for a new seniors living community located on 'bushfire prone land' at the above address. This report presents the assessment and recommendations to ensure that the proposed development will comply 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 subject land

The subject land is a single lot located at the western cul-de-sac of Lakewood Drive overlooking Merimbula Lake to the south.

The lot is approximately 2.9 hectares in size and is surrounded by predominantly cleared lands except to the north where bushland within the northern portion of the subject land is contiguous with a larger bushland area. A drainage line at the base of a steep slope characterises the vegetated northern section.

1.3 Description of development proposal

The proposal is a seniors living community featuring:

- Independent living units within four-storey apartment blocks
- Bowling club and green
- Pool and pool house
- Multi-use space

1.4 Assessment requirements

The subject land is identified as containing 'bushfire prone land' as shown on Figure 3. Development proposals involving seniors living 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 Bush Fire Protection 2019* (RFS 2019), referred to as 'PBP' throughout this report.

Chapter 6 of PBP addresses SFPP development and outlines the assessment methodology and protection measures, such as Asset Protection Zones (APZ), Bushfire Attack Levels (BAL), adequate access and water supply for fire-fighting, and vegetation management.



Legend

- Cadastre
- Subject Land



Date: 28/06/2022

0 150 300 600
Metres

Figure 1: Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend

 Subject Land



Date: 28/06/2022

0 5 10 20
Metres

Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend







- | | |
|---|---|
|  Cadastre |  Vegetation Category 3 |
|  Subject Land |  Vegetation Buffer |
| Bushfire Prone Land | |
|  Vegetation Category 1 | |
|  Vegetation Category 2 | |

Figure 3: Bushfire Prone Land



Date: 28/06/2022

0 50 100 200
Metres

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

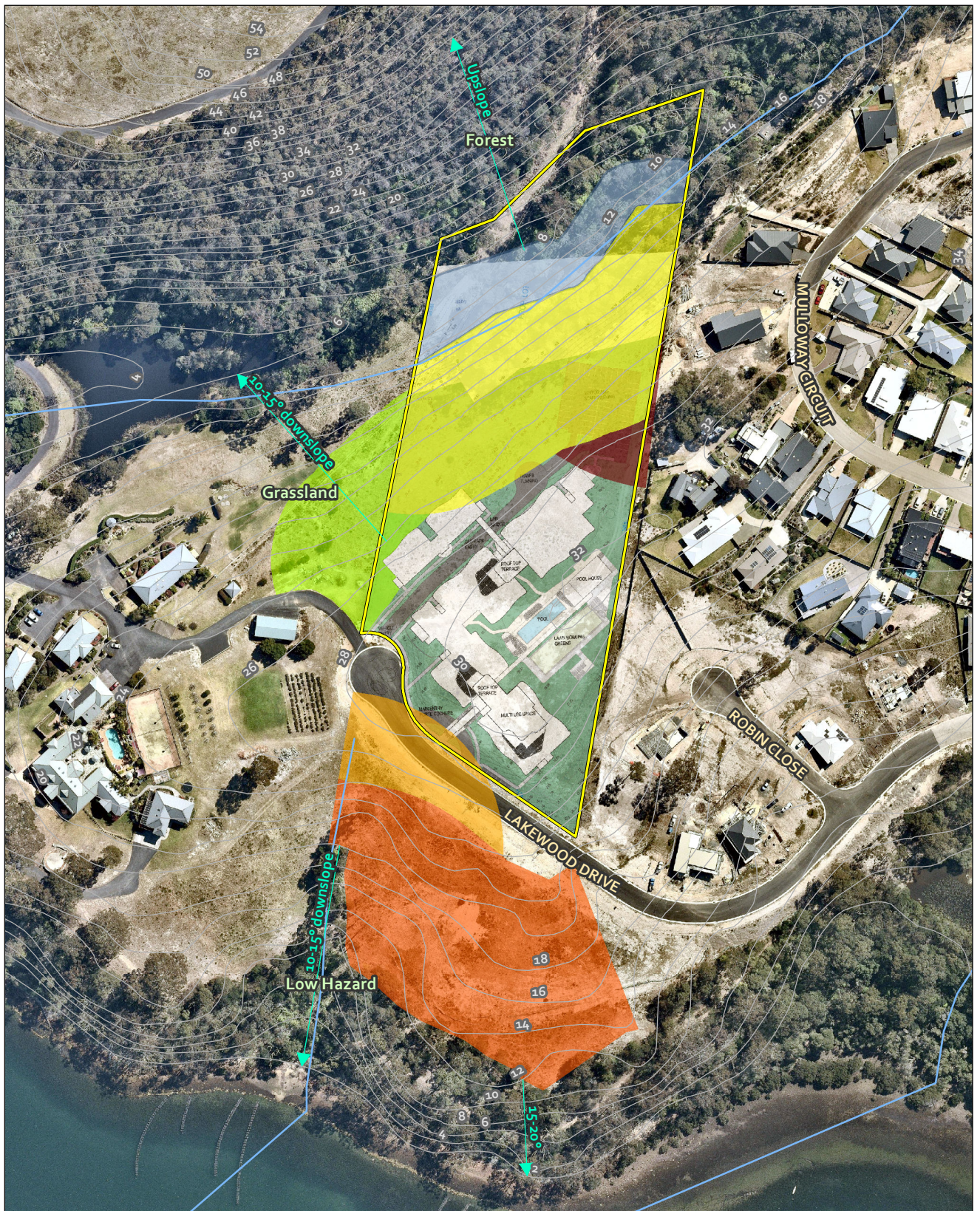
2 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as APZ location and dimension. This section provides 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.

The 'predominant vegetation' and 'effective slope' influencing fire behaviour approaching the proposed development has been assessed in accordance with the methodology specified by PBP. The site and hazard were inspected on 23rd November 2021. Photographs are provided at Appendix A.

The bushfire hazard within the 140 m assessment area measured from the proposed development takes on four forms as described below and mapped on Figure 4:

- **North-east – forest on adjoining property:** The forest on adjoining property to the north-east is on a gradient in the PBP slope class of 'downslope 5-10 degrees' measured across the contours.
- **North – riparian corridor:** Forest within the northern portion of the subject land is situated on a steep downslope to the drainage line followed by upslopes. The slope influencing fire behaviour has been classified as 'upslope' on the opposite side of the drainage line based on the proposed management of the forest downslope to the 10 m riparian corridor buffer.
- **West – grassland:** The unmanaged portions of the adjoining property to the west present a grassland hazard. The grassland is situated on a gradient in the slope class of 'downslope 10-15 degrees'.
- **South – low hazard corridor:** The bushland corridor along the shores of Merimbula Lake is classified as 'low hazard vegetation' as it forms a corridor no wider than 50 m. The corridor is steep ('downslope 15-20 degrees') either side of the gully, reducing in gradient along the gully itself ('downslope 10-15 degrees').



Legend

- Contour - 2m
- Watercourse
- Subject Land
- Riparian Buffer - 10m

Asset Protection Zone

- Asset Protection Zone - 50m
- Asset Protection Zone - 67m
- Asset Protection Zone - 69m

- Asset Protection Zone - 81m
- Asset Protection Zone - 93m



Date: 30/06/2022

0 20 40 80
Metres

Figure 4: Bushfire Hazard Analysis and Asset Protection Zone

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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 1 below and are discussed in detail in the remainder of this section.

Table 1: PBP bushfire protection measures

Bushfire protection measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from identified hazards including prescriptions of vegetation management within the APZ.
Building construction standards (BALs)	Mapping and application of BALs across the site to highlight affected buildings.
Access	Assessment to include access to and within the site, perimeter access, and design standards of any internal roads.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.
Emergency and evacuation management	Preparation of a 'Bushfire Emergency Management and Evacuation Plan'.

3.1 Asset Protection Zones (APZ)

Using the hazard parameters of vegetation and slope discussed in Section 2, the required Asset Protection Zone (APZ) between the development and the bushfire hazard has been determined using Table A1.12.1 of PBP. Table 2 on the following page lists the APZ results and the APZs are mapped on Figure 4.

The proposed buildings are to be located on site so that they do not encroach within the APZ.

APZ establishment is required within the site in the north direction down to the riparian corridor and within the adjoining property to the west as mapped on Figure 4. Vegetation management standards to satisfy APZ requirements are listed within Section 3.2.

Table 2: Determination of APZ

Location ¹	Vegetation ²	Slope ³	PBP APZ ⁴	APZ establishment
North-east	Forest	Downslope 5-10°	93 m	Within the site combined with the APZ to the north down to the riparian corridor
North	Forest	Upslope	67 m	Within the site down to the riparian corridor
West	Grassland	Downslope 10-15°	50 m	Within adjoining property to the west by way of a s88b easement
South	Low hazard	Downslope 10-15°	69 m	Lakewood Drive road reserve and cleared lots beyond
	Low hazard	Downslope 15-20°	81 m	

¹ Location of hazard with reference to development proposal.

² Predominant vegetation classification over 140 m from development.

³ Effective slope assessed over 100 m from development site where the bushfire hazard occurs.

⁴ Minimum APZ required by PBP Acceptable Solution for SFPP development.

3.2 APZ management and landscaping

The APZ and the developable area is to be managed to comply with APZ fuel management standards (i.e. Inner Protection Area standard). The following fuel management standards have been formulated to comply with the following RFS documents guiding APZ establishment and maintenance:

- *Planning for Bush Fire Protection 2019* Appendix 4; and
- *Standards for Asset Protection Zones*.

A summary of the relevant fuel management standards is as follows:

- Canopy: Trees are to have a discontinuous canopy by achieving gaps between crowns of 2 to 5 m. Small clumps of trees can remain forming one larger crown providing larger gaps to the next adjacent crown of minimum 5 m is achieved.
- Understorey: Understorey shrubs and saplings should not be within the APZ unless they are within defined and well-managed garden beds separated from the building.
- Groundcover: Groundcovers such as grasses are to be regularly mowed or slashed to minimal height (i.e. 100 mm).

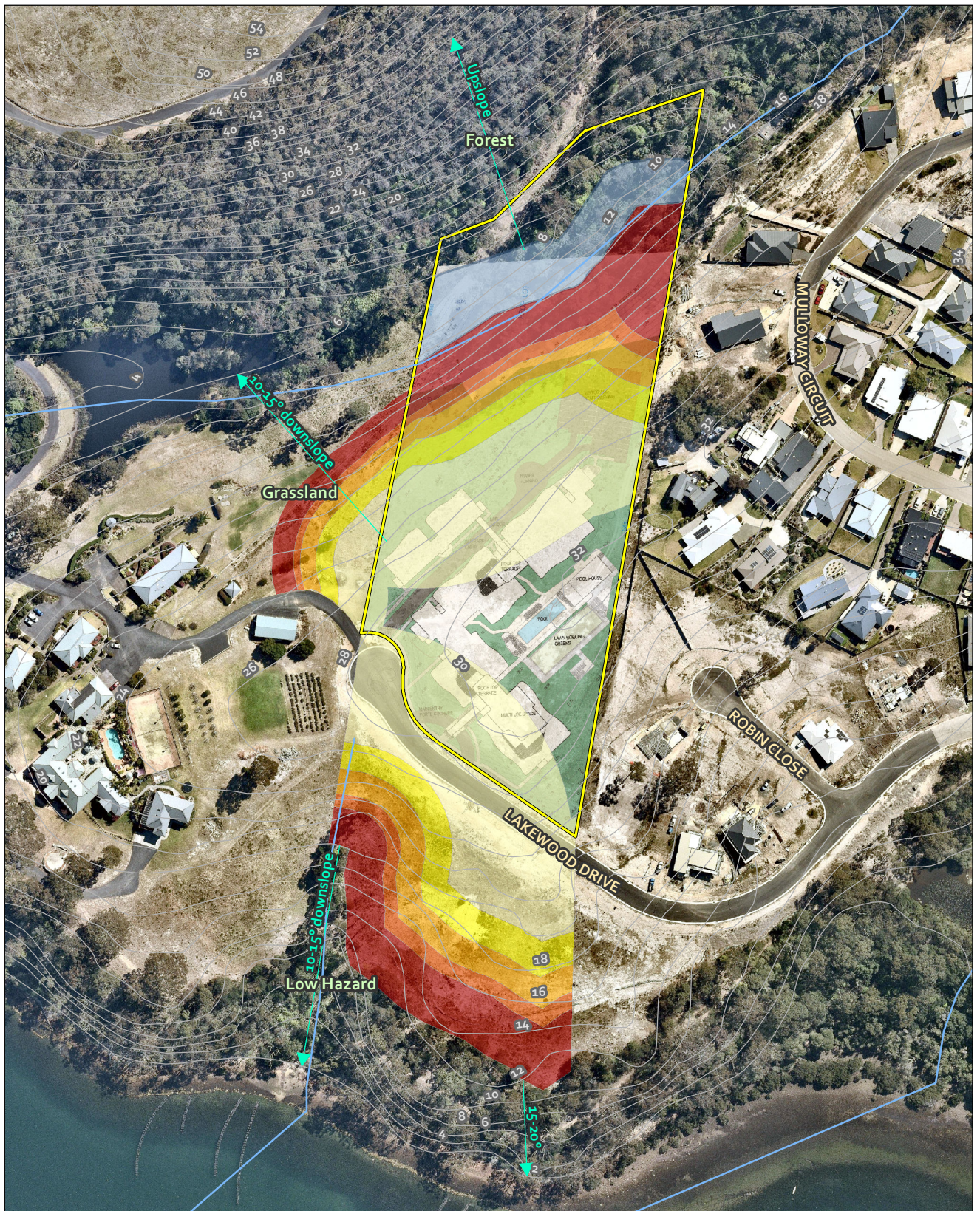
Landscaping installed throughout the site will also need to satisfy the principles listed within Appendix 4 of PBP.

3.3 Bushfire Attack Level (BAL)

The Bushfire Attack Levels (BAL) for the site have been determined in accordance with PBP Table A1.12.5. Figure 5 shows the BALs affecting the site.

Those buildings affected (wholly or partially) by the BAL-12.5 area are required to be designed and constructed to comply with BAL-12.5 of Australian Standard *AS 3959-2018 Constructions of buildings in bushfire-prone areas* (AS 3959). All buildings (except for the pool house, pool and bowling green) are to be designed and constructed to comply with BAL-12.5.

The NSW variation to AS 3959 is also to be applied to the BAL-12.5 requirements. The variation can be found at Section 7.5.2 of PBP.



Legend

Contour - 2m	Bushfire Attack Level	BAL 19
Watercourse	BAL Flame Zone	BAL 12.5
Subject Land	BAL 40	
Riparian Buffer - 10m	BAL 29	



Date: 30/06/2022

0 20 40 80
Metres

Figure 5: Bushfire Attack Level

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3.4 Access

3.4.1 Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

The site is within the existing built-up residential area of Merimbula and is accessed by Lakewood Drive. Lakewood Drive is the main access road for the area providing access east to Merimbula business district via Monaro Street or Merimbula Drive. Lakewood Drive provides access in the east direction away from the oncoming bushfire threat to the west. It traverses predominantly residential areas and is unlikely to be cut-off by the impacts of the fire. Secondary access could be gained via the Robyns Nest tourist accommodation development adjoining to the west during an emergency if required.

3.4.2 Design of internal roads

The two proposed internal roads are to comply with the Acceptable Solutions of PBP (Table 6.4b) for SFPP development as listed below. Both roads are classed as 'non-perimeter' roads for design compliance.

The proposed northern road provides fire-fighter operational access to the rear of the buildings at the northern APZ. Tankers can stand in the proposed cul-de-sac at the location of hydrants and reach the entire building interface within 70 m east and west of the cul-de-sac

PBP Acceptable Solution design standards for internal roads servicing SFPP developments:

- *SFPP access roads are two-wheel drive, all weather roads.*
- *Access is provided to all structures.*
- *Traffic management devices are constructed to not prohibit access by emergency service vehicles.*
- *Access roads must provide suitable turning areas in accordance with Appendix 3 of PBP.*
- *One way only public access roads are no less than 3.5 m wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.*
- *The capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges and causeways are to clearly indicate load rating.*
- *Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.*

- *Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005.*
- *There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.*
- *Non-perimeter roads are:*
 - *Minimum 5.5 m carriageway width kerb to kerb;*
 - *parking is provided outside of the carriageway width;*
 - *hydrants are located clear of parking areas;*
 - *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - *curves of roads have a minimum inner radius of 6 m;*
 - *the maximum road grade is 15° and average grade of not more than 10°;*
 - *the road crossfall does not exceed 3°;*
 - *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*

3.5 Water supply and utilities

3.5.1 Water supply

A hydrant system is to be installed to comply with Australian Standard AS 2419.1 – 2005 *Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419). Hydrants will need to be installed along the access roads to ensure compliant distances (i.e. all sides of a building are within 70 m of a hydrant by lay of the hose). A hydrant is required adjacent the proposed cul-de-sac.

3.5.2 Electricity supply

Electrical supply will be provided underground and therefore complies with PBP.

3.5.3 Gas supply

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

3.6 Emergency management and evacuation

A 'Bushfire Emergency Management and Evacuation Plan' is to be prepared for the development prior to occupation of the buildings. The Plan is to be prepared in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014).

4 Conclusion and recommendations

4.1 Conclusive summary

This report presents an assessment of a proposed seniors living development against the specifications and requirements of *Planning for Bush Fire Protection 2019* (PBP).

Asset Protection Zones (APZ) compliant with the PBP Acceptable Solutions for Special Fire Protection Purpose (SFPP) development have been applied to the identified hazards and proposed buildings are to be located to ensure that they do not encroach on the APZ.

The existing public road access leads away from the bushfire threat and provides adequate access for the development. The proposed internal access roads are to comply with the PBP Acceptable Solutions for non-perimeter roads.

With the adoption of the recommendations below (see Section 4.2), the proposed development will comply with the Acceptable Solutions of *Planning for Bush Fire Protection 2019* for Special Fire Protection Purpose (SFPP) development.

4.2 Recommendations

The recommendations made within Section 3 of this assessment are repeated below:

1. APZs are to be applied to the site as mapped on Figure 4. Buildings are not to encroach within the APZs.
2. An APZ as mapped on Figure 4 is to be formalised within the adjoining property to the west via a s88b easement.
3. The developable area and APZs are to be established and maintained to achieve the fuel management specifications of an Inner Protection Area (IPA) as guided by Section 3.2 of this report and Appendix 4 of *Planning for Bush Fire Protection 2019*.
4. Any proposed landscaping around the development site is to achieve the principles listed in Appendix 4 of *Planning for Bush Fire Protection 2019*.
5. All buildings except the pool house, pool and bowling green are to be designed and constructed to comply with BAL-12.5 as prescribed by Australian Standard AS 3959-2018 *Construction of buildings in bushfire-prone areas*. The NSW variation to AS 3959 is also to be applied to the BAL-12.5 requirements. The variation can be found at Section 7.5.2 of *Planning for Bush Fire Protection 2019*.
6. The internal road roads are to be designed to comply with the Acceptable Solutions of *Planning for Bush Fire Protection 2019* for non-perimeter roads of SFPP development (Table 6.4b) as repeated at Section 3.4.2 of this report.
7. A hydrant system is to be installed to comply with Australian Standard AS 2419.1 – 2005 *Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).

Hydrants will need to be installed along the access roads to ensure compliant distances (i.e. all sides of a building are within 70 m of a hydrant by lay of the hose). A hydrant is required adjacent the proposed cul-de-sac.

8. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.
9. A 'Bushfire Emergency Management and Evacuation Plan' is to be prepared for the facility prior to occupation of the buildings. The Plan is to be prepared in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014).



David Peterson



References

NSW Rural Fire Service (RFS). 2014. *A Guide to Developing a Bushfire Emergency Management and Evacuation Plan*. State of New South Wales through the NSW Rural Fire Service.

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Standards Australia. 2018. *Construction of buildings in bushfire-prone areas*, AS 3959, Standards Australia International Ltd, Sydney.

Standards Australia. 2014. *The storage and handling of LP Gas*, AS/NZS 1596-2014, Standards Australia International Ltd, Sydney.

Appendix A – Photographs



Photograph 1: Forest on slopes leading down to drainage line at northern end of site



Photograph 2: Side profile view of forest on slopes in the northern end of site



Photograph 3: Drainage line and riparian corridor



Photograph 4: Low hazard vegetation to the south of Lakewood Drive

