

Bush Fire Assessment Report

Proposed:
Seniors Living

At:
**Waterbrook Seniors
Living Village
Bayview NSW**

Reference Number: 140962D

Prepared For:
Waterbrook Bayview Pty Ltd

2nd July 2019



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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches 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
NCC	National Construction Code
NSP	Neighbourhood Safer Places
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2006
ROW	Right of Way
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 Site Compatibility Certificate application relates to the construction of a new Seniors Living Village within the grounds of Bayview Golf Club. The subject property is located at 52 Cabbage Tree Road Bayview NSW (Lot 1 DP 19161 & Lot 1 DP 662920). The subject site is at the northwestern end of the Golf Course and has street frontage to Cabbage Tree Road to the south and maintained golf course grounds surround the development to the remaining aspects.

The vegetation posing a hazard to the proposed development was found to be located to the west and northwest within Bayview Golf Course grounds which has linkage to unmanaged vegetation within private residential allotments (zoned RU2) and Barkala Estate further to the west and northwest of the subject site and is also associated with an existing watercourse in this area.

Northern Beaches (Pittwater) Council's Bushfire Prone Land Map identifies the subject property as containing Category 1 Vegetation and the 100 metre buffer zone from designated Category 1 Vegetation, therefore the application of Planning for Bush Fire Protection - 2006 (PBP) must apply in this instance.

The future development application will be assessed against the requirements for SFPP development under section 4.2.7 of PBP.

The NSW Rural Fire Service have assessed similar proposals on three separate occasions and on all three occasions issued their Bushfire Safety Authority under section 100B of the Rural Fires Act 1997 (30th January 2018, 12th July 2018 and 7th November 2018).

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide Waterbrook Bayview, the Department of Planning and Environment, Council and the Rural Fire Service with an independent bushfire hazard determination together with appropriate recommendations for both new 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, and further development application, construction conditions and/or bushfire mitigation measures that the Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Site Compatibility Certificate application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire hazard 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.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2013, the RFS document known as 'Planning for Bush Fire Protection – 2006' for the purposes of bushfire hazard determination and Australian Standard 3959 – 2009 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

Company representatives have undertaken several site inspections of the subject property and the surrounding area. The Site Considerations plan by Marchese Partners, Job No. 14023, Drawing No. DA1.02.2 Rev A has been relied upon for this assessment.

Events relating to previous application:

Following the receipt of the additional information letter issued to Council on 5th June 2018 and specifically the matter relating to the Asset Protection Zones being located within land mapped as geotechnical hazard in the Pittwater LEP we have been liaising with the NSW Rural Fire Service with the view of having the Bushfire Safety Authority modified to resolve this conflict.

A site meeting was held with Mr Luc Roberts (Development Assessment & Planning Officer, NSW Rural Fire Service), Mr Kevin Ryan (Waterbrook) and Stuart McMonnies (Manager Bushfire Section, Building Code & Bushfire Hazard Solutions P/L) on Monday 25th June 2018. The purpose of this meeting was to inspect and discuss the area which is mapped as geotechnical hazard and the possible additional bushfire protection measures in light of the request to exclude the geotechnical area from the designated APZs, as this land does not form part of the application. Various potential options / solutions were discussed.

On Tuesday 26th June 2018 we received correspondence from Craig Casey (Development Assessment & Planning Officer, NSW Rural Fire Service), who had reviewed the initial request with both Nika Fomin (Manager Planning and Environment Services) and Kalpana Varghese (Acting Team Leader Development Assessment and Planning), detailing preferred additional bushfire protection considering the scattered nature of the vegetation, surrounding degree of ongoing vegetation management, and its Low hazard classification and configuration. This modified report incorporates the agreed additional Bushfire Protection Measures.

The NSW Rural Fire Service issued a modified Bush Fire Safety Authority (BSA) (ref D18/100, dated 12th July 2018) under Section 100B of the 'Rural Fires Act 1997' which excluded the land mapped as geotechnical hazard in the Pittwater LEP from the Asset Protection Zone. A later modified BSA (dated 7th November 2018) maintained the exclusion of the land mapped as geotechnical hazard in the Pittwater LEP from the Asset Protection Zone.

Regardless of the NSW RFS excluding the land mapped as geotechnical hazard in the Pittwater LEP from the Asset Protection Zone requirements the current application includes management requirements over the majority of this area.

Image 01: Site Considerations plan by Marchese Partners, Job No. 14023, Drawing No. DA1.02.2
Rev A



The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

	Northwest	South	East	West
Vegetation Structure	Forest	Maintained curtilages	Maintained curtilages	Forest
Vegetation Width	100 metres	N/A	N/A	100 metres
Slope	0 degrees & upslope	N/A	N/A	0 degrees & upslope
Minimum APZ for new SFPP	60 metres	N/A	N/A	60 metres
Separation Distance Blocks A to D, F and Facilities	>100 metres*	N/A	N/A	>100 metres*
Separation Distance Block E	>100 metres*	N/A	N/A	>80 metres*
Significant Environmental Features	Maintained grounds / existing golf course	Cabbage Tree Road	Maintained grounds / existing golf course	Maintained grounds / existing golf course
Threatened Species	Not known by others	Not known by others	Not known by others	Not known by others
Aboriginal Relics	Not known by others	Not known by others	Not known by others	Not known by others
Bushfire Attack Level Blocks A to D, F and Facilities	BAL Low	N/A	N/A	BAL Low
Bushfire Attack Level Block E	BAL Low	N/A	N/A	BAL 12.5
Proposed construction level	<p>All construction for Blocks E, F and the Facilities Building shall comply with BAL 29 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009; and</p> <p>All construction for Blocks A, B, C & D shall comply with BAL 19 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009</p>			

* The available separation distance to the bushfire hazards includes the land mapped as a geotechnical hazard, which is excluded from the maintenance burden of an Asset Protection Zone. The characteristics of this land allow it to be considered 'equivalent to an APZ' or 'Low threat vegetation' while not requiring designation as an APZ. Additional bushfire protection measures have been included in the proposal to compensate for this land being excluded as designated APZ.

Regardless of the NSW RFS previously excluding the land mapped as geotechnical hazard in the Pittwater LEP from the Asset Protection Zone requirements the current application includes management requirements over the majority of this area.

Asset Protection Zones Compliance

The minimum required Asset Protection Zones (APZs) for the proposal were determined to be 60 metres to the northwest and 60 metres to the west.

The location of the subject site is such that the minimum required APZs will be exceeded completely within the subject site including the proposed 5th and 6th fairway to the north and west. The proposed Blocks A to D, F and facilities building as shown on the plans within the development area are greater than 100 metres from the hazards and only Block E is within 80 metres of the hazard to the west.

Construction Level Compliance

The highest Bushfire Attack Level to the proposed Blocks A to D, F and facilities buildings was determined to be 'BAL Low' and there are therefore no specific requirements for construction under AS 3959 – 2009 Construction of buildings in bushfire prone areas.

The highest Bushfire Attack Level to the proposed Block E was determined from Table 2.4.2 of AS 3959 – 2009 to be 'BAL 12.5'. The proposed Block E is required to comply with Section 3 and BAL 12.5 under section 5 of AS 3959 – 2009 and the additional requirements detailed within Addendum Appendix 3 to PBP 2006.

As part of previous applications additional Bushfire Protection Measures were included to compensate for the land mapped as geotechnical hazard being excluded as designated APZ, which included the following construction provisions:

All construction for Blocks E, F and the Facilities Building shall comply with BAL 29 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009; and

All construction for Blocks A, B, C & D shall comply with BAL 19 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009

The current application includes management requirements over the majority of the land mapped geotechnical hazard. Regardless the additional Bushfire Protection Measures have been retained to provide additional protection above the minimum requirements.

Access and Services

Guideline Ref.	Proposed Development Determinations
Property Access	The subject property has street frontage and access to Cabbage Tree Road to the south. New access to the central facilities building will be constructed to service the site as part of this proposal and access to the hazard interface will be retailed and facilitated by using the golf course fairways. Further detail regarding the public road infrastructure will be detailed within s7.07 of this report.
Water Supply	A hydrant system will be installed to service the proposed apartment blocks. The sizing, spacing and pressures of this system must comply with AS2419.1-2005. Furthermore fire hose reels and other essential fire safety provisions will be installed in accordance with the National Construction Code.
Evacuation	It will be recommended that the Bush Fire Evacuation Plan be prepared for the new facility in accordance with the NSW Rural Fire Service guidelines for emergency management plans as part of this development.

6.0 Aerial view of the subject allotment



Image 02: Aerial view of the subject area c/- Nearmap.com

7.0 Bushfire Hazard Assessment

7.01 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 (APZ's) 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 and amended May 2010 (Appendix 3) 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 the construction of a new Seniors Living Village within the grounds of an existing golf course. To accord with PBP the development is classified as Special Fire Protection Purpose development and assessed as a section 100b application under the Rural Fires Act 1997. The application has been assessed against the requirements for SFPP development under section 4.2.7 of PBP.

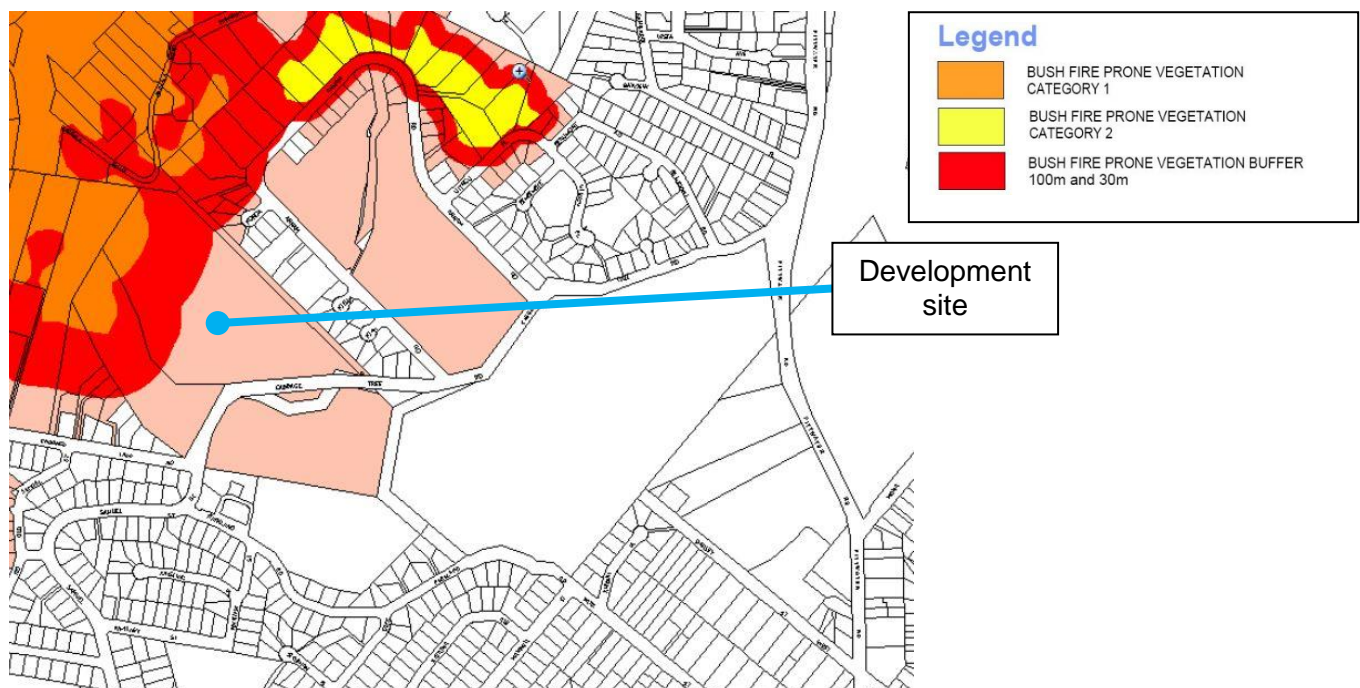


Image 03: Extract from Northern Beaches Council's Bushfire Prone Land Map

7.02 Location

The development proposal relates to the construction of a new Seniors Living Facility within the grounds of Bayview Golf Club. The subject property is located at 52 Cabbage Tree Road, Bayview NSW (Lot 1 DP 19161 & Lot 1 DP 662920). The subject site is at the northwestern end of the Golf Course and has street frontage to Cabbage Tree Road to the south and maintained golf course grounds to the remaining aspects.

The vegetation posing a hazard to the proposed development was found to be located to the west and northwest within Bayview Golf Course grounds which has linkage to unmanaged vegetation within private residential allotments (zoned RU2) and Barkala Estate further to the northwest of the subject site and is also associated with an existing watercourse in this area.



Photograph 01: View west into the subject site from Cabbage Tree Road

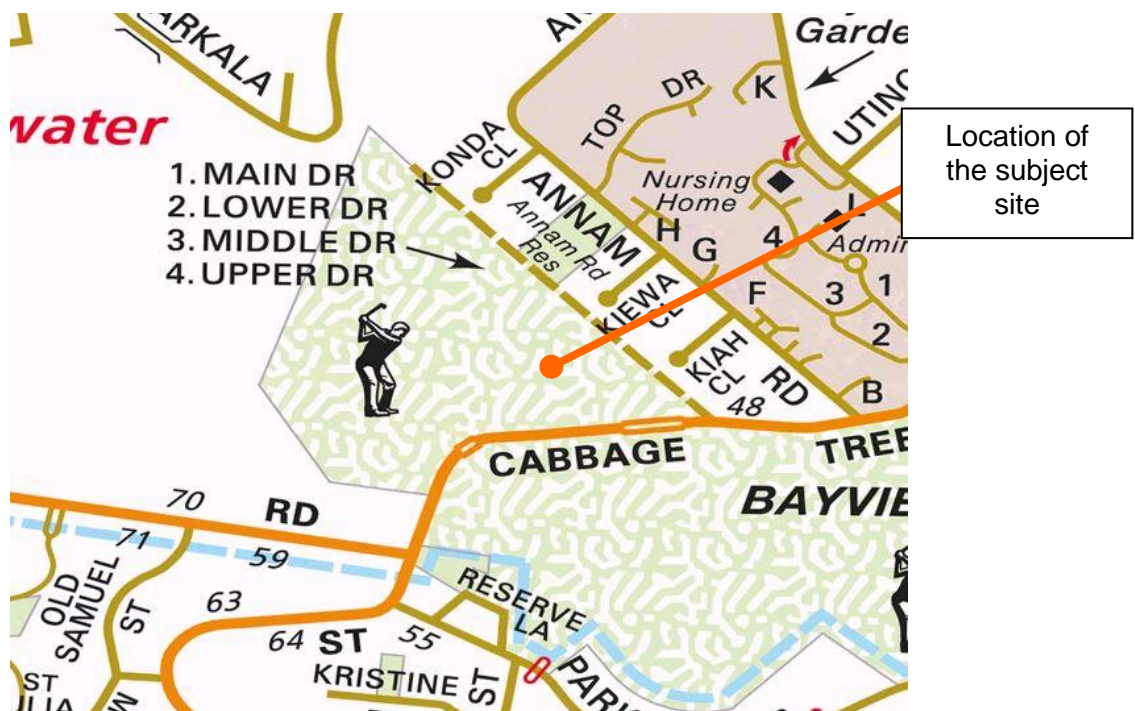


Image 04: Extract from street-directory.com

7.03 Vegetation

The vegetation posing a hazard to the proposed development was found to be located to the northwest and west within Bayview Golf Course grounds and has direct linkage with unmanaged vegetation further northwest within nearby private allotments and Barkala Estate. The area contains an existing watercourse.

The vegetation posing a hazard was found to consist of trees 10-20 metres in height with a >70% canopy foliage cover and an understorey of low trees, shrubs ferns and vines, with a predominance of broad leaved species although ground cover was minimal. The area was generally covered with rainforest species with a slight edge effect of weeds and forest like structure.

In reviewing online vegetation mapping database it was found that the vegetation to the northwest is identified as being Coastal Warm Temperate Rainforest along the gully and either side of the water course and Central Coast Escarpment Moist Forest to the northwest on the upslope within the subject site and into private allotments and Barkala Estate, and Pittwater Spotted Gum Forest to the west on the upslope within the subject site and neighbouring private allotments.

Under a Keith classification the area is best described as a Forest. For the purpose of assessment against Planning for Bush Fire Protection 2006 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009 the vegetation posing a hazard to the northwest and west is determined to be a Forest structure.

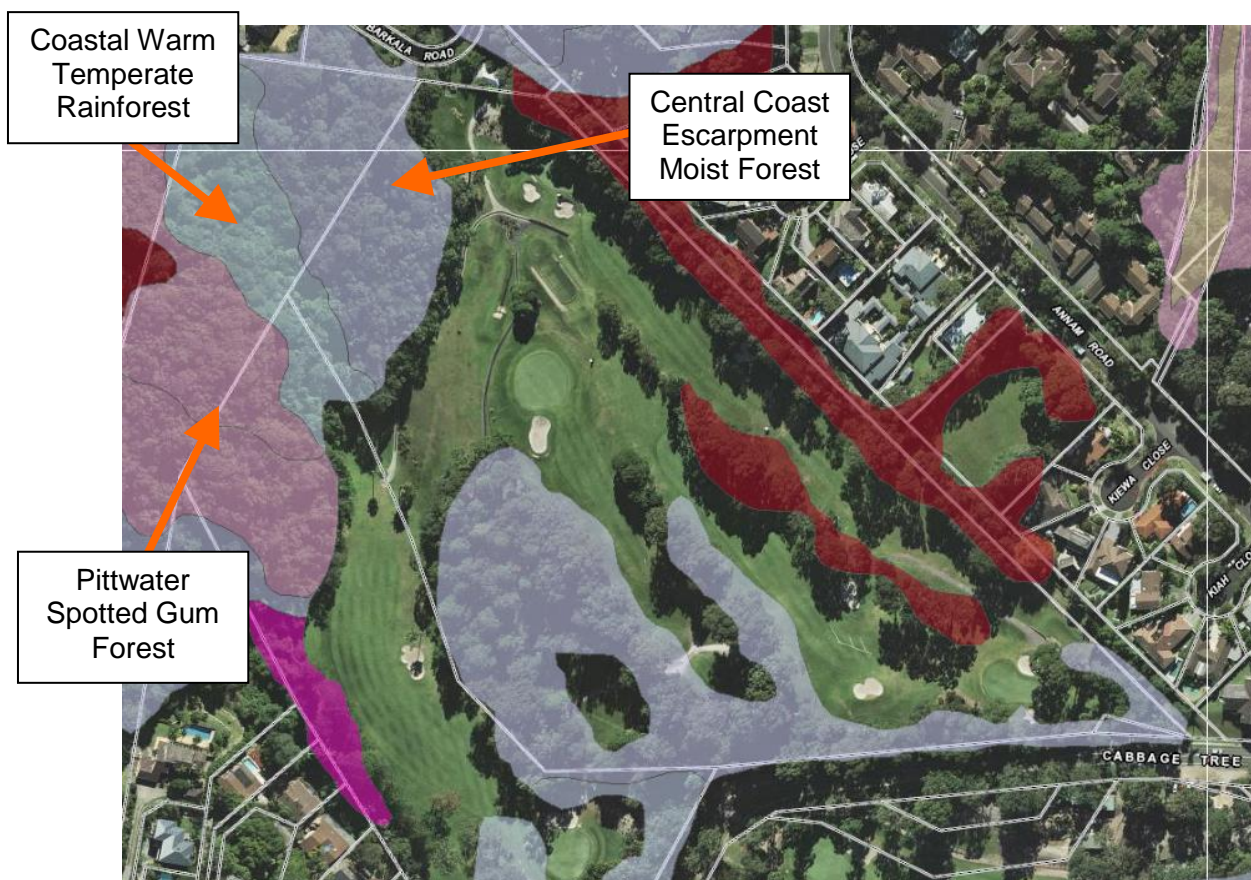


Image 05: Extract from Dept. Lands SixMaps online mapping database 2014



Photograph 02: View west across the proposed 6th fairway towards the hazard interface



Photograph 03: View northwest adjacent the hazard taken west of the development site



Photograph 04: View within the vegetation west of the proposed 6th fairway.

7.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from within the bushfire hazards.

The most significant bushfire impact from within the hazard to the northwest and west is expected to be a bushfire burning downslope slope towards the development site. The slope that would **most significantly** influence bushfire impact was measured onsite and verified by digital topographic data to be:

- 0 degrees & upslope within the hazard to the northwest and west

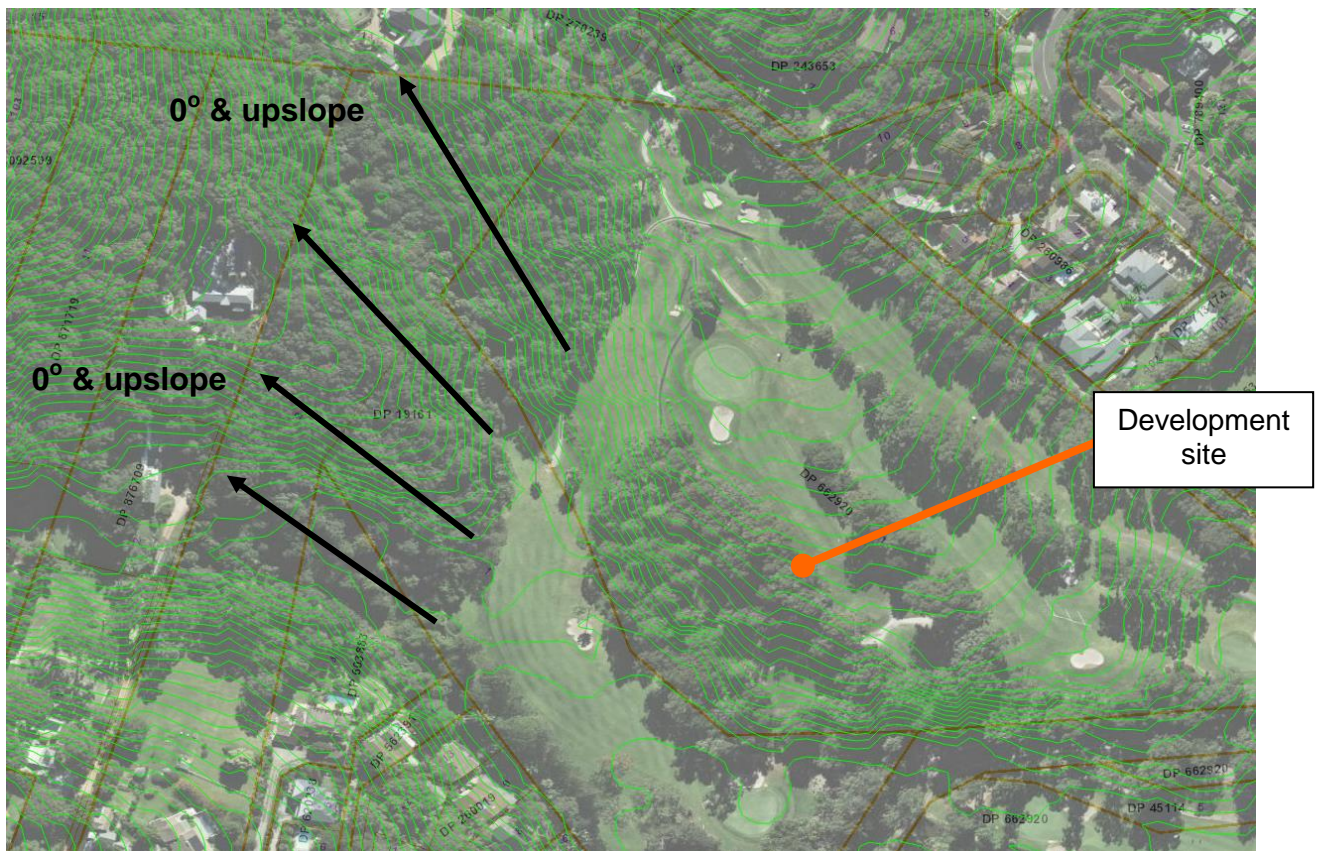


Image 06: Extract from Geoscience Australia (ELVIS) QGIS data showing 1 metre contours.

7.05 Asset Protection Zones

Asset Protection Zones for new Special Fire Protection Purpose (SFPP) development are determined from Table A2.6 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m^2 at the closest point of the available building footprint.

The minimum required Asset Protection Zones (APZs) for the proposal were determined to be 60 metres to the northwest and 60 metres to the west. The location of the subject site is such that the minimum required APZs will be exceeded completely within the subject site including the upgraded 5th and 6th fairway to the north and west. The proposed Blocks A to D, F and facilities building as shown on the plans within the development area are greater than 100 metres from the hazards and only Block E is within 80 metres of the hazard to the west.

Previous applications sought to have the land mapped as geotechnical hazard under the Pittwater LEP 2014 excluded from the APZ requirements as at that time it was understood that the Seniors Living Policy did not apply to that land.

The mapped geotechnical hazard area is located to the northwest, south and west of the development site and in the immediate area was found to comprise of part of an existing fairway, some mature trees with a cleared understorey, existing buggy and service trails, maintained gardens and two pockets of fully structured vegetation. Please refer to the attached photographic montage (Attachment 01).

Beyond the excluded area, an existing fairway provides a 40-metre separation, comprising of mown lawns and three palm trees, from the identified bushfire hazard.

While previous applications excluded this land from any formal APZ requirements the current application includes management requirements over the majority of this area.

It is also noted that the obvious function of the surrounding land (including geotechnical hazard area) as a golf course will see continued management of the fairway, slashed area and gardens, thus allowing it to be considered 'equivalent to an APZ' or 'Low threat vegetation', as per the works programme of the golf club (attached).

The additional Bushfire Protection Measures which were included in the previous applications to compensate for the geotechnical hazard area being excluded as designated APZ have been retained in this proposal regardless of the inclusion of additional management requirements.

An easement under s88B of the Conveyancing Act 1919 will be required on the surrounding land to ensure that either the Golf Course or Waterbrook are responsible for Asset Protection Zone and additional managed area. The easement may not be necessary over future golf course fairways but will be required where management relies on the verges being maintained between the estate and the fairways.

We have reviewed the 'Tree Retention & Removal' plan prepared by Footprint Green Pty Ltd (dwg no. aiatr1.01, rev 9.5, dated 26/11/18) and are satisfied it identifies the trees required for removal to satisfy the APZ and geotechnical area maintenance recommendations contained herein.



Image 07: Aerial image showing extent of APZ

7.06 Property Access / Evacuation

The Bayview Golf Club land has street frontage to Cabbage Tree Road.

The proposed seniors living apartment buildings will be accessed from Cabbage Tree Road and the proposed internal road to the facilities building and an underground car park. This new road must comply with the requirements for Internal Roads as detailed in section 4.2.7 of Planning for Bush Fire Protection 2006. In this regard it is noted that the carriageway being greater than 6.5 metres two way non perimeter road satisfies these requirements. Vehicle access is not provided above ground to the apartment blocks however the most distant external point of the proposed residential apartment blocks will be less than 70 metres from an internal hydrant network and free pedestrian access will be maintained around the site.

The turning head at the facilities end of the access drive has been engineered (by others) to enable a fire appliance to turn around at this turning head in a “three point turn” motion, and this is demonstrated on Images 7 and 8 on the following pages. In this regard the turning area should be a No Parking area and any loading zone or parking area located outside this turning head.

Direct access to the hazard interface will be maintained by the golf course and is achieved by providing emergency vehicle access into the fairways around this development. I do note that there is a steep portion between proposed fairways 5 and 6 where fire appliances cannot easily traverse however access above the slope (i.e. the 5th tee area) and below the slope (on the proposed 6th fairway) is only restricted to less than 110 metres separation, an area easily covered by two fire appliances and two lengths of hoses from each. Fire truck access for a fire appliance onto the fairways north and south of the development must be maintained (4 metres trafficable width with a 4 metre vertical clearance).

The attached statement provided by Mr Ralf Erni of Martens & Associates Pty Ltd dated 27th November 2018 demonstrates that suitable fire appliance access is available along the fairways.

Attending fire services can then access the hazard via the golf course for hazard reduction or fire suppression activities. The emergency management plan should include an emergency response map that can be shared with the local agencies so that they are familiar with the site access arrangements.

Persons seeking to egress the proposed apartment blocks will be able to do so via the proposed underground parking to the proposed internal road access and on to Cabbage Tree Road without the need to travel towards the hazard interface and from this point along existing public road infrastructure to the east or south without travelling towards any other high hazards.

Access and egress routes have been designed by Swept Path Analysis of an 8.5m Category 1 fire appliance to comply with the above, (see images overleaf).

Access for fire services and opportunities for occupant evacuation will be considered adequate for this property.

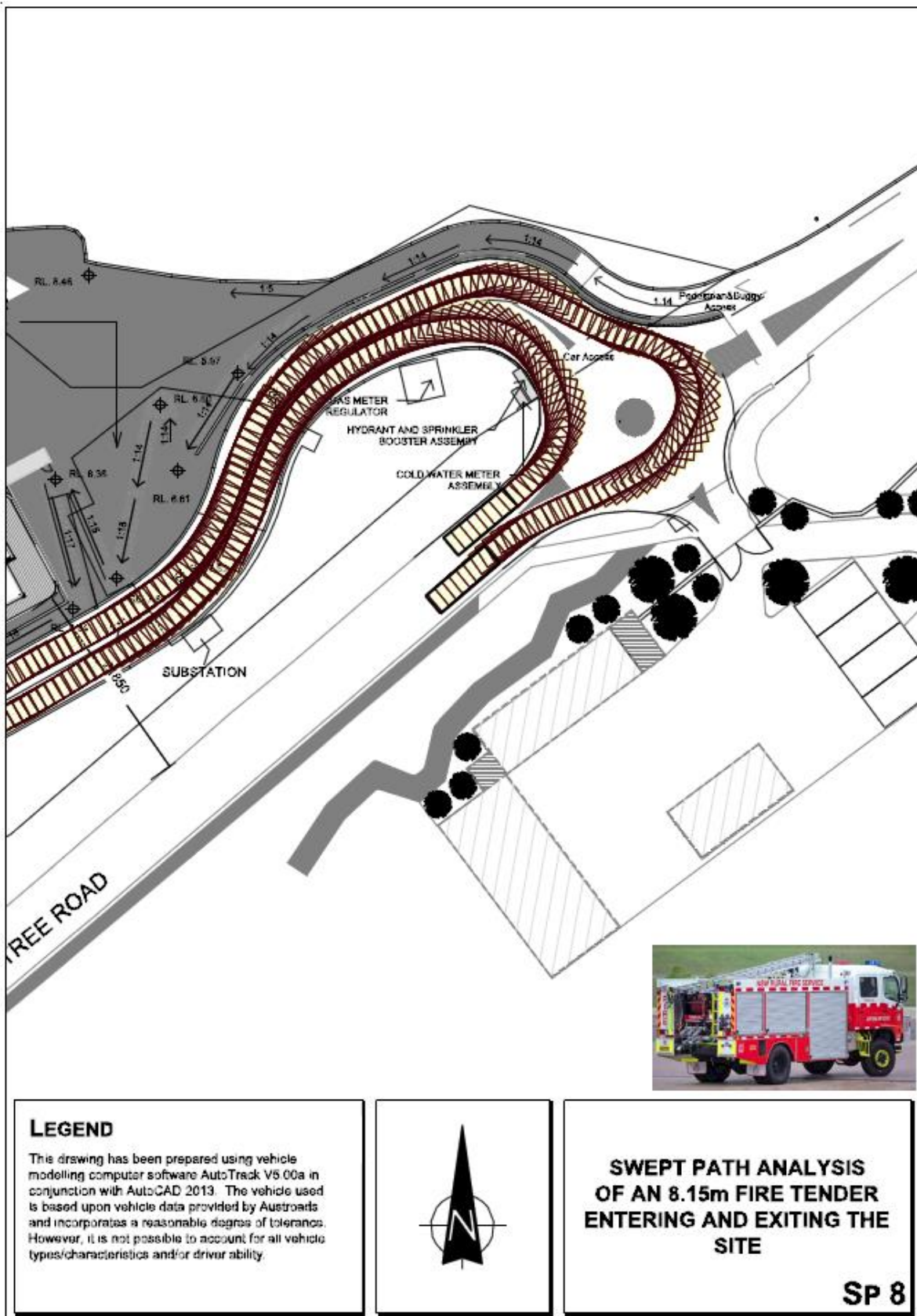


Image 07: Sp 8 Swept Path analysis for Category 1 Fire Appliance for Access and Egress

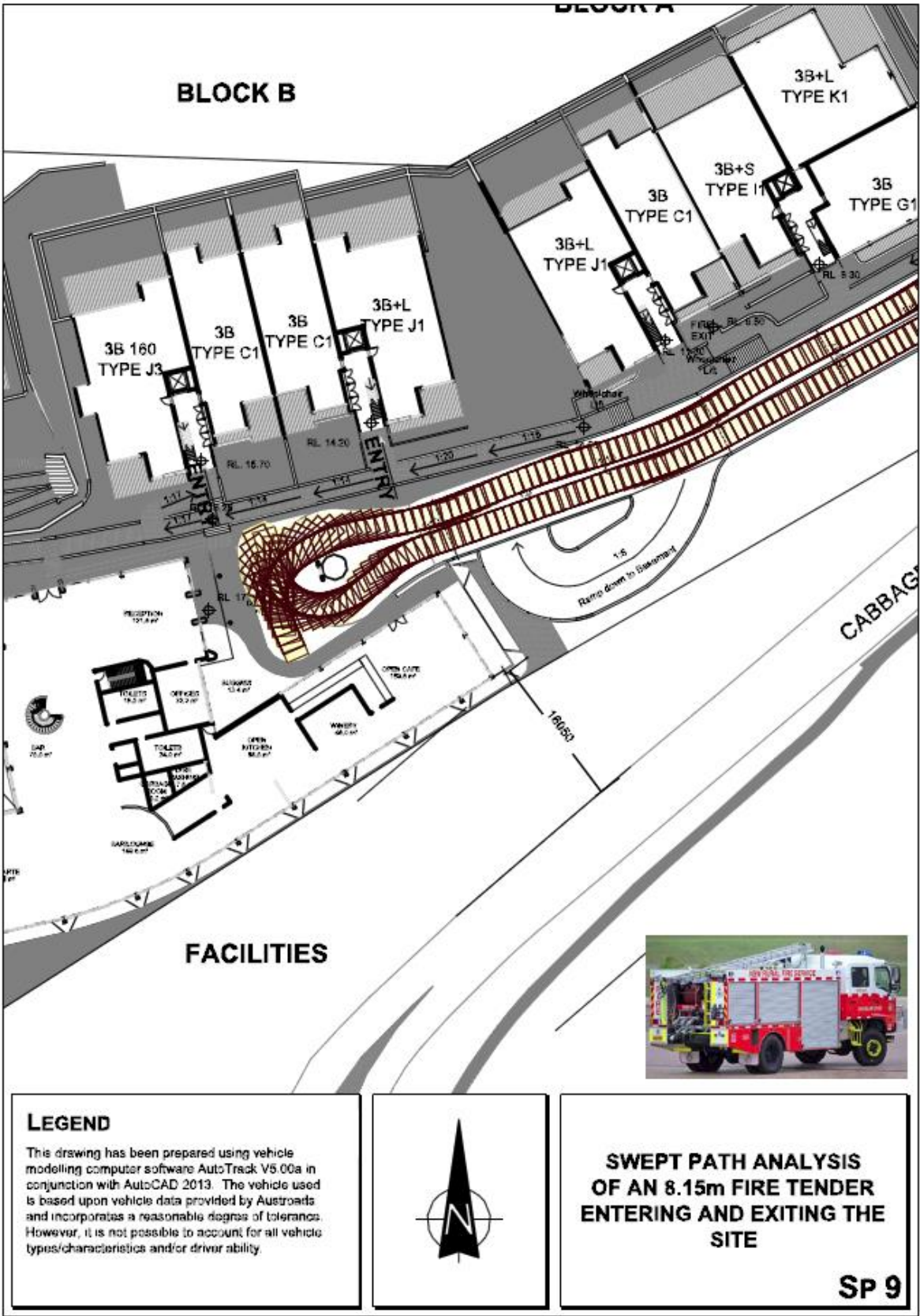


Image 08: Sp 9 Swept Path analysis for Category 1 Fire Appliance for Access and Egress ('T' Turning provision)

7.07 Fire Fighting Water Supply

The proposed development will be connected to the reticulated town's water main along Cabbage Tree Road for their domestic needs and water mains will be extended into the subject site. The sizing, spacing and pressures of the proposed hydrants must be in accordance with AS2419.1-2005.

Furthermore fire hose reels and other essential fire safety provisions will be installed in accordance with the National Construction Code. The proposed water supply is considered adequate for the replenishment of attending fire services.

7.08 High-Rise Development

As this development is similar to a residential flat building consideration has also been given to the NSW Rural Fire Service Practice Note 2/12 'Planning Instruments and Policies', specifically in relation to high-rise development within bushfire prone land detailed within Appendix 1.

This document details additional points of consideration when assessing high-rise development within bushfire prone areas. The following table lists the additional consideration points and our comment of the proposals ability to address them.

Consideration	Comment
Location – high-rise buildings should not be located along ridges or along slopes with significant fire runs;	The proposed seniors living apartment blocks are not located on a ridge or along slopes with significant fire runs.
Existing infrastructure – when highrise developments are proposed their impact during potential bush fire emergencies needs to be considered, particularly in terms of evacuating occupants along the road network and the availability of water supplies available for high-rise firefighting;	<p>The proposed seniors living apartment blocks will have underground parking discharging onto Cabbage Tree road to the southeast facilitating egress away from the hazard.</p> <p>Hydrants will also be installed within the site in accordance with AS2419.1-2005. Furthermore fire hose reels and other essential fire safety provisions will be installed in accordance with the National Construction Code.</p> <p>In consideration of the bushfire threat posed to the subject development, site specific circumstances the subject site is considered acceptable for high-rise development.</p>
External facades – external facades may result in increased exposure to radiant heat and also convection columns. Specialised modelling may be needed and APZs may need to be increased over and above those specified to account for this.	The majority of the proposed development will be located >100 metres from any bushfire hazards. The setbacks are designed for 10 kW/m ² and not 29 kW/m ² like residential flat buildings are. Specialised modelling is not needed in this instance.
Potential for entrapment - the risk associated with occupant egress is higher in high-rise buildings than for lower-rise structures and therefore the potential for entrapment during a bush fire emergency should be addressed	In consideration of the bushfire threat posed to the subject development and site specific circumstances and egress routes the subject site is considered acceptable for high-rise development.

8.0 Site & Bushfire Hazard Determination

8.01 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.*

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP as follows:

Northwestern Aspect:

- a) Vegetation Structure Forest
- b) Slope 0 degrees across or upslope
- c) The minimum required APZ for new SFPP development is 60 metres
- d) A >100 metre separation is available

Western Aspect Block A to D, F and facilities building

- a) Vegetation Structure Forest
- b) Slope 0 degrees and upslope
- c) The minimum required APZ for new SFPP development is 60 metres
- d) A >100 metre separation is available

Western Aspect Block E

- a) Vegetation Structure Forest
- b) Slope 0 degrees and upslope
- c) The minimum required APZ for new SFPP development is 60 metres
- d) A >80 metre separation is available

8.02 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.

8.03 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

8.04 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 Bayview Golf Course was assessed against the requirements of Planning for Bush Fire Protection 2006 noting the following:

- The proposed access provisions are considered adequate.
- The new hydrants will comply with the sizing, spacing and pressures of AS2419.1-2005.
- Fire hose reels and other essential fire safety provisions will be installed in accordance with the National Construction Code.

8.05 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 Blocks A to D, F and facilities buildings was determined to be 'BAL Low' and there are therefore no specific requirements for construction under AS 3959 – 2009 Construction of buildings in bushfire prone areas.

The highest Bushfire Attack Level to the proposed Block E was determined from Table 2.4.2 of AS 3959 – 2009 to be 'BAL 12.5'. The proposed Block E is required to comply with Section 3 and BAL 12.5 under section 5 of AS 3959 – 2009 and the additional requirements detailed within Addendum Appendix 3 to PBP 2006.

As part of previous applications additional Bushfire Protection Measures were included to compensate for the land mapped as geotechnical hazard being excluded as designated APZ, which included the following construction provisions:

All construction for Blocks E, F and the Facilities Building shall comply with BAL 29 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009; and

All construction for Blocks A, B, C & D shall comply with BAL 19 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009

The current application includes management requirements over the majority of the land mapped geotechnical hazard. Regardless the additional Bushfire Protection Measures have been retained to provide additional protection above the minimum requirements.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2006 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' - 2009.

Asset Protection Zones

- 1) At the commencement of building works, and in perpetuity, the area around the proposed buildings, excluding the land mapped geotechnical hazard in the Pittwater LEP 2014, shall be managed as outlined within section 4.1.3 and Appendix 5 of 'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones' as follows:
 - West: Inner Protection Area (IPA) for a distance of 80 metres;
 - North, Northwest and Southeast: Inner Protection Area (IPA) for a distance of 100 metres;
 - South and Southwest: Inner Protection Area (IPA) for a distance of 80 metres; and
 - Northeast: to the property boundary
- 2) Any new tree planting within 'Area A' (as shown on Figure 01 below) must not exceed the requirements for an Inner Protection Area as described in the NSW Rural Fire Service document 'Standards for Asset Protection Zones'.



Figure 01: Management Area 'A'

- 3) That the area nominated as 'Area B' (as shown on Figure 02 overleaf) be treated to provide Sandstone Rocks, with clusters of ferns, groundcovers and maximum 20% Shrub Cover or the understorey shall comply with the requirements for an Inner Protection Area as described in the NSW Rural Fire Service document 'Standards for Asset Protection Zones'.



Figure 02: Management Area 'B'

4) On Figure 03 below:

- a. the area marked "C" is to be weeded and the local native understorey is to be conserved and re-established to achieve a coverage of 20% in clumps and islands. Existing trees are to be retained and no new trees planted in this area;
- b. the area marked "D" shall not be managed as an Asset Protection Zone (Inner or Outer Protection Area). Removal of exotic weed species is to be undertaken and all native vegetation is to be retained within this portion of the geotechnical hazard area; and
- c. the area marked "E" on Figure 03 is to be maintained as an Asset Protection Zone - Inner Protection Area.

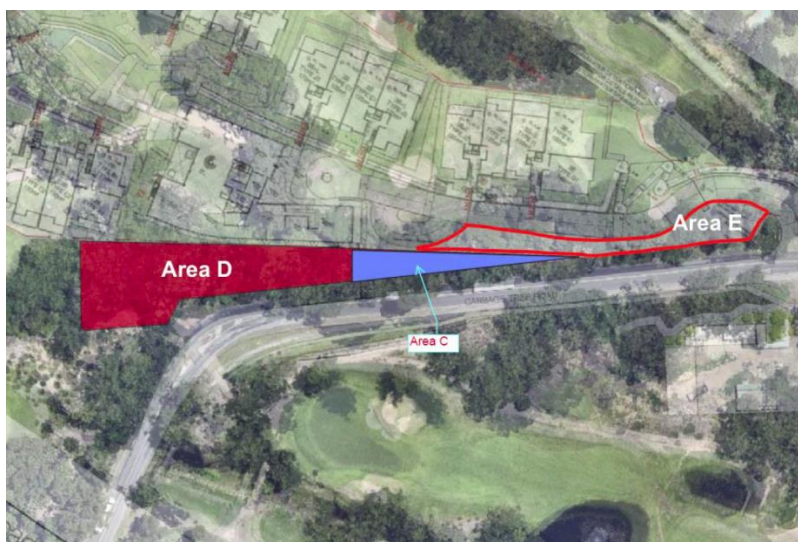


Figure 03: Management areas 'C', 'D' and 'E'

- 5) An easement or public positive covenant under s88B of the Conveyancing Act 1919 will be required on the surrounding land to ensure that either the Golf Course or Waterbrook are responsible for Asset Protection Zone management. The easement may not be necessary over future golf course fairways but will be required where management relies on the verges being maintained between the estate and the fairways.

Northern Beaches Council shall be nominated as the party to release, vary or modify such covenant.

- 6) That all land designated as an Asset Protection Zone on the Bayview Golf Course is not eligible for the 10/50 land clearing provisions under Part 4 Division 9 of the Rural Fires Act 1997.

Grounds Management Plan

- 7) A fuel management plan for the Asset Protection Zones is prepared and is required to address:
- Contact person / department and details
 - Schedule and description of works for establishing and continued maintenance of the Asset Protection Zones
 - Management strategies and description of works for landscaped areas within the site

Emergency Management

- 8) A Bush Fire Evacuation Plan must be prepared in accordance with the NSW Rural Fire Service guidelines for emergency management plans.
- 9) The emergency management plan must include an emergency response map that can be shared with the local agencies so that they are familiar with the site access arrangements.

Construction

- 10) All construction for Blocks E, F and the Facilities Building shall comply with BAL 29 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.
- 11) All construction for Blocks A, B, C & D shall comply with BAL 19 under section 7 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

Access

- 12) There must be a No Parking restriction at the internal turning head east of the facilities building and along the entire length of the proposed internal road.
- 13) Fire truck access for a fire appliance onto the fairways north and south of the development must be maintained (4 metres trafficable width with a 4 metre vertical clearance).
- 14) The internal road must comply with section 4.2.7 of Planning for Bush Fire Protection 2006.

Services

Electricity

- 15) Where practicable, electrical transmission lines must be underground.
- 16) Where overhead electrical transmission lines are proposed:
 - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

Water

- 17) The new hydrant sizing, spacing and pressures must comply with AS2419.1 – 2005.

Gas

- 18) Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities.
- 19) Metal piping is to be used.
- 20) All fixed gas cylinders must be kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation.
- 21) If gas cylinders need to be kept close to the building, the release valves must be directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion.
- 22) Connections to and from gas cylinders must be metal.
- 23) Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

10.0 Conclusion

Given that the property is deemed bushfire prone under Northern Beaches Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2006 and of the construction requirements of Australian Standard 3959 – 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 proposal relates to the construction of a new Seniors Living Village within the grounds of Bayview Golf Club. The subject property is located at 52 Cabbage Tree Road Bayview NSW (Lot 1 DP 19161 & Lot 1 DP 662920). Recommendations have been considered and applied to ensure the development complies with Planning for Bush Fire Protection 2006 and AS3959 – 2009 Construction of Buildings in Bushfire Prone Areas.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development and also satisfy both the Rural Fire Service's concerns and those of Council in this area.

We are therefore in support of the proposal.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions



Stuart McMonnies

Manager Bushfire Section
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Certification number – BPAD9400



Reviewed by
Building Code & Bushfire Hazard Solutions P/L



David McMonnies, AFSM. / M I Fire E

Managing Director
Masters of Construction Mgt.
G. D. Design in Bushfire Prone Areas.
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Certification number – BPAD2354



11.0 Annexure 01

List of Referenced Documents

- a) Environmental Planning and Assessment Act - 1979
- b) Rural Fires Act 1997 as amended
- 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) 'Ocean Shores to Desert Dunes' David Keith
- f) 'Northern Beaches Council's Bushfire Prone Land Map'
- g) Acknowledgements to:
Nearmap.com
Street-directory.com.au
- h) Site Considerations plan by Marchese Partners, Job No. 14023, Drawing No. DA1.02.2 Rev A
- i) Bushfire Safety Authority issued by the NSW Rural Fire Service (30th January 2018, 12th July 2018 and 7th November 2018).

Attachments

- | | |
|----------------|---|
| Attachment 01: | Photographic Montage |
| Attachment 02: | Bayview Golf Club Course Maintenance Standards |
| Attachment 03: | Statement provided by Mr Ralf Erni of Martens & Associates Pty Ltd dated 27 th November 2018 |

Attachment 01:

Photographic Montage



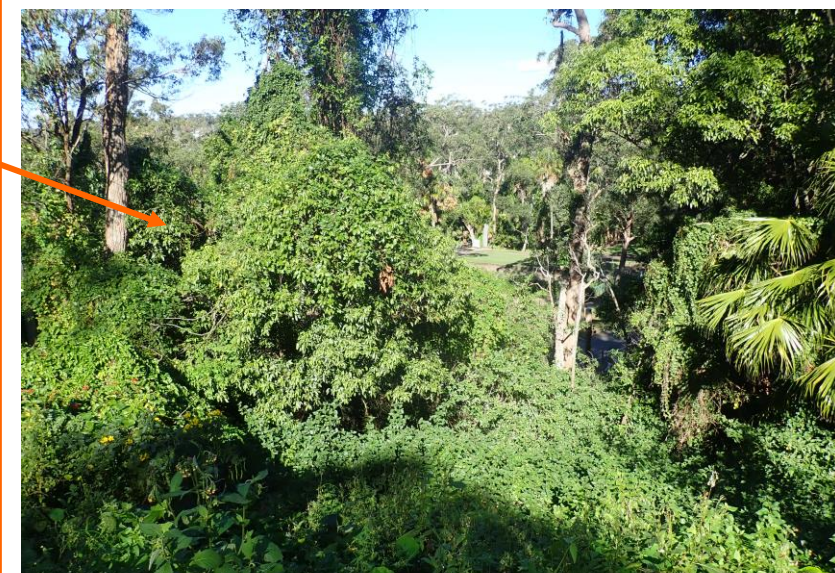
View south of the fairway which occupies part of the geotechnical hazard area.



View south along the mapped geotechnical hazard area



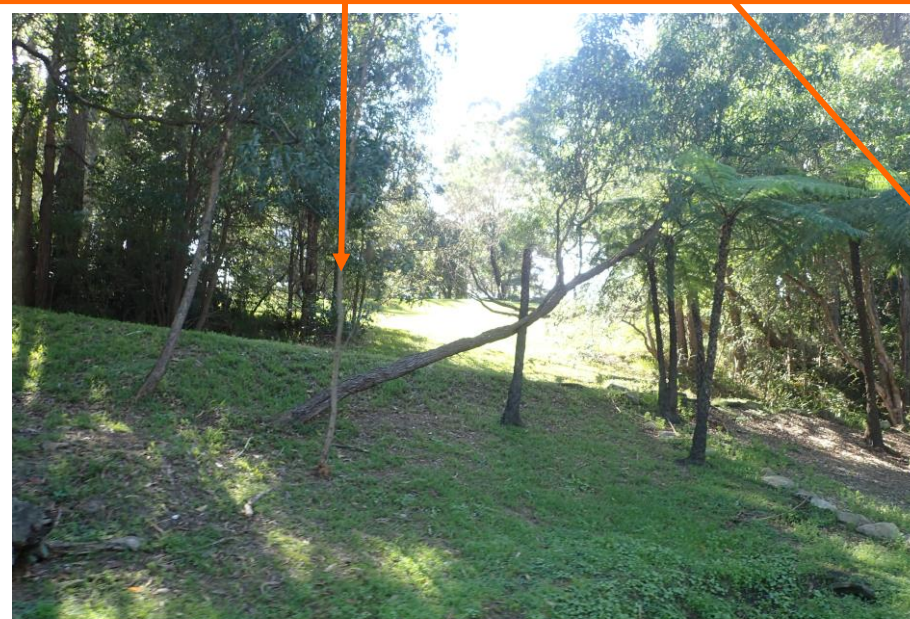
View east from the fairway toward the mapped geotechnical hazard area.



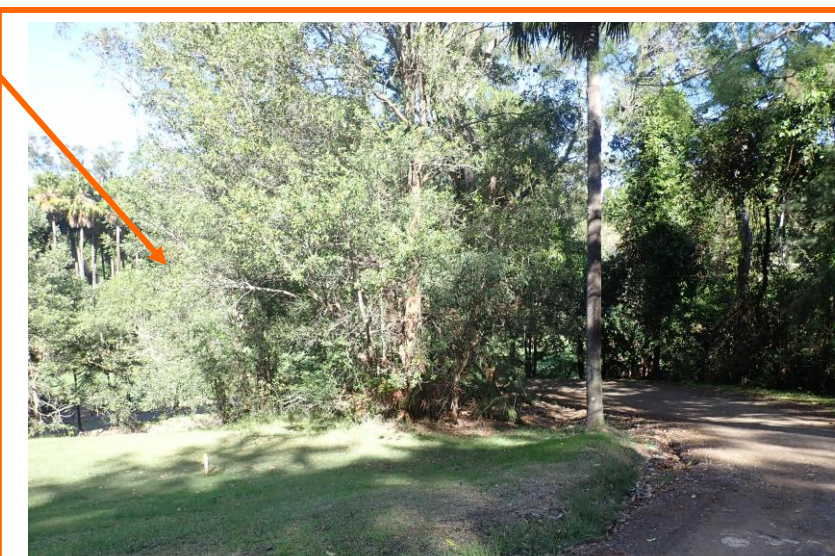
View south toward the mapped geotechnical hazard area



View northwest from within the mapped geotechnical hazard area



View north from within the mapped geotechnical hazard area



View south toward the mapped geotechnical hazard area

Aerial view and photographic montage of
**52 Cabbage Tree Road &
 1825 Pittwater Road, Bayview**
 June 2018 / Our Ref: 140962

Attachment 02:

Bayview Golf Club Course Maintenance Standards

**Course Maintenance Standards
Bayview Golf Club**

The following are the targets / goals for the maintenance team:

- The course will be maintained to a level of a group 1 golf course all turf areas will have 100% turf coverage and free of any weeds or pests. The course needs to exceed the expectations of both our members and visiting golfers on a regular basis. The course maintenance must be carried out in well organised and professional manner.
- Maintain the design intent of the golf course as outlined by the Course Architect Graham Papworth (GNP) there should be no significant changes to the design intent, including any and all facets of the design, playability, landscape or maintenance standards.
- Maintain the efficiency of the golf course maintenance operations and maximise the golf course maintenance budget for the overall benefit of the club and its members.
- Maintain and improve golf course maintenance operations by employing qualified and proficient staff and by having a continued commitment to employing trainees and provide training on all aspects of golf course maintenance.
- Conform to a documented OH&S and environment management plan and maintain records on each.

The following reporting procedures will be implemented:

- The Course Superintendent will post a quarterly calendar displaying all activities that relate to turf management and improvement, including renovation, fertilisation, pesticide applications and turf replacement.
- A monthly improvement plan will be developed by the Course Superintendent and approved by the Course & Grounds committee.
- A weekly report on the progress of the golf course will be developed by the Course Superintendent and will be made available on the clubs website for members.

Staffing levels

The following maintenance standards are of the highest level and are achievable - however they will require the following staffing levels and annual budget:

Greenkeeping Team

1. Course Superintendent
2. Forman / 2IC
3. Greenkeeper
4. Groundsman
5. Groundsman
6. Apprentice Greenkeeper
7. Apprentice Greenkeeper
8. Apprentice Greenkeeper
9. Apprentice Greenkeeper

Mechanical Team *(including 36 x cart maintenance)*

10. Mechanic

Garden & Ornamental Lawn Team

11. Horticulturist

Palm Beach Team

12. Forman / 2IC
13. Greenkeeper

Annual Budget

The annual budget will need to be the below to maintain the above staffing levels and the following maintenance standards with CPI added each year.

Bayview Course Budget

Bayview Budget	2017/18	2018/19	Comments
Bunker Sand	0	9,000	
Chemicals	36893	44,000	
Computer & Software Expenses	0	0	
Electricity	23713.19	24,000	
Environmental Testing	900	1,800	
Fertilizer	37190.2	42,000	
Fuel & Oil	20299.56	22,000	
Garden/Tree Maintenance	8600	30,000	Generous allocation
Interest Expense on Hire Purchases	18789.12	14,000	
Motor Vehicle/Travel Expenses	8095.46	10,000	
Payments on New Equipment	38737.68	10,000	
WHS-Work Health & Safety	1500	1,500	
Soil	15059.45	22,000	
Sundry Expenses - COURSE	6814.03	7,000	
Telephone - Course	2288.23	2,600	
Waste Removal	3706.12	8,000	Weekly bin pickups not fortnightly
Water Rates	8148.82	25,000	Generous allocation
Wetting Agent	13039	10,000	
Repairs & Maintenance	88639.5	60,000	Includes constant re-turfing and seed
R&M- Irrigation	19820.2	20,000	
R&M- Machinery	35547.01	40,000	
Superannuation - Course	54603.45	60,000	
Wages & Salaries - Greens	600656.8	648,000	
Workers Compensation - Course	10170.78	11,000	
Annual Leave Loading - Course	24611.47	24,000	
Long Service Leave - Course	634.25	1,000	
Staff Training	2967.82	2000	
Uniforms/PPE	8762.73	10000	
Total Expenses	1090188	1,158,900	

Golf Course Standards

Greens

- Overview:** All greens grass species are to be certified A1/A4 Bent, all greens are to be smooth, uniformly turfed, firm but not hard, well defined and free of all major pest problems. Cups, poles and flags are to be uniform, clean and in good repair.

Mowing frequency	5 x Days per week
Mowing equipment	Walk/behind midweek + Triplex week-ends
Rolling	As required to maintain green speed
Cutting height	2.5mm – 4mm
Daily Putting speed	9 – 11
Cups changed	Daily
Pitch Marks repaired	1 x per week
Flags poles	7 foot tournament with black & white striping
Cups	Aluminium
Flag heads	Bayview Logo + Blue/White/Yellow system

Aprons & Collars

- Overview:** All aprons & collars are to be smooth, uniformly turfed, firm but not hard, well defined and free of all major pest problems.

Mowing frequency	2 x per week
Mowing equipment	Triplex
Cutting height	6mm – 9mm
Divots repaired	2 x per week

Tees

- Overview:** All tee grass species are to be certified Santa Ana Couch, tees are to be smooth, completely turfed, level, firm but not hard, clean, properly directed, with amenities in good condition and repair, consistent and uniform. Markers rotated consistent with cup rotation system and aligned with the line of play.

Mowing frequency	2 x per week in warm season & weekly during cool season
Mowing equipment	Triplex
Cutting height	7mm – 10mm
Tee markers changed	Daily in conjunction with flag system
Divots repaired	2 x per week
Ballwashers	1 x per hole serviced daily
Sand box & rubbish bin	1 x per hole serviced daily
Seats	1 x per hole
Water coolers / bubblers	5 in total on 3 rd , 6 th , 9 th 12 th & 15 th tees serviced daily
Primo application	Monthly during warm season
Iron application	Monthly during cool season

Fairways

- **Overview:** All fairway grass are to be certified Santa Ana Couch, fairways are to be smooth, completely turfed, level, firm but not hard and a consistent turf cover.

Mowing frequency	2 x per week in warm season & weekly during cool season
Mowing equipment	5-plex light fairway mower
Cutting height	8mm – 12mm
Divots repaired	1 x per week
Primo application	Monthly during warm season
Iron application	Monthly during cool season

Green surrounds & Short Rough

- **Overview:** Properly mowed and trimmed, clean and adequately uniform for play, distinct in height from fairway and rough completely turfed level and a consistent turf cover.

Mowing frequency	2 x per week in warm season & weekly during cool season
Mowing equipment	Triplex surrounds mower
Cutting height	16mm – 22mm
Divots repaired	1 x per week

Rough

- **Overview:** Properly mowed and trimmed, clean and adequately uniform for play, distinct in height from short rough.

Mowing frequency	1 x per week in warm season & fortnightly during cool season
Mowing equipment	Rotary floating head mower
Cutting height	25mm – 50mm

Tee Surrounds

- **Overview:** Properly mowed and trimmed, clean and adequately uniform for play, distinct in height from tee decks completely turfed level and a consistent turf cover.

Mowing frequency	1 x per week in warm season & fortnightly during cool season
Mowing equipment	Triplex surrounds mower
Cutting height	16mm – 22mm
Edging & Blowing	1 x per week

Bunkers

- **Overview:** All Bunkers will contain the same colour and specification of the sand supplied during construction, they should also be clean, well-defined, weed-free, raked and edged, well-drained, uniform and consistent throughout each bunker and the golf course. The minimum sand depth of 10cm.

Rakes placed inside the bunkers with the handles perpendicular to bunker edges, easily reached by golfers without them having to step into bunkers to retrieve rakes.

Complete raking frequency	3 x per week
Spot check raking frequency	4 x per week on alternate days
Edging	Fortnightly
Primo application	Monthly during warm season

Irrigation System

- The Irrigation system will be kept in full working order at all times.
- All associated sprinkler heads, valve boxes, QCV valves, drainage pits, pump shed filters and decoders should be serviced on a regular basis.

Cart Paths

Overview: All paths clean, well defined, edged, smooth, in good repair, well-drained and properly located with adequate width and proper surface for use. Curbing should be used for traffic control wherever possible, Permanent traffic=c devices should be pre-approved and carried consistently throughout the property, keeping aesthetic value and safety in mind

Edging	Fortnightly
Sweeping / Blowing	2 x per week
Worn areas	Not acceptable

Water Bodies

- **Overview:** Clean, well defined, free of weeds, algae and noxious growth also marked attractively in accordance with the rules of golf.

Clubhouse Grounds

- **Overview:** Neat, well maintained grounds. Lawns weed free, mowed and edged, flowers of the season well cared for and properly rotated. All beds free of weeds, leaves and litter. All grounds free of litter and debris.
- Parking lots and sidewalks policed for litter daily and blown with blower or swept daily prior to guests/members arrival
- Lawns will be mowed two times per week during warm season and weekly during cool season also fertilised, irrigated and edged on a regular basis.
- Landscape materials will be designed and installed to support both sun and shade as the areas present themselves. All plant material shall be fertilised, properly pruned and pest free.
- Annuals and perennials will be planted in properly amended soil and support sun or shade as the areas present themselves.
- Fencing of all golf course surrounds will maintained to its initial standard. Damage to the fencing will be repaired as a matter of priority but not less than 7 days.
- Any Graffiti to the golf course hard scape, clubhouse, maintenance facility and entry statement will be removed as a matter of priority but not less than 7 days.

Tree Trimming

- **Overview:** All trees that prevent 100% turf grass coverage in the “in play areas” due to light exclusion must be selectively pruned. Trees that impose a safety threat to golfers or staff (falling branches etc.) must be removed or selectively pruned. Tree canopy height shall be consistent throughout the golf course. Stumps are unacceptable in all segments with the exception of areas designated as natural habitats.

Maintenance Facility and Equipment Standards

Maintenance Facility

- **Overview:** The maintenance facility will be kept clean and tidy at all times (*indoor and outdoor areas*) with machinery stored in an orderly manner.
- Maintenance facility will be operated in accordance with all the statutory OH&S and environmental requirements.

Maintenance Equipment

- **Overview:** All maintenance equipment will be kept in full working order at all times.
- All machinery will be kept clean and stored in an orderly manner to maximise the use of storage area.
- All equipment will be serviced regularly and all mowers will be kept sharp and provide a good quality of cut.
- Risk assessments will be kept for all operation of equipment, and daily maintenance staff will adhere to OH&S requirements whilst using the maintenance equipment.

Driving Range & Practice Area

Practice Green

- **Overview:** All practice greens are to be as similar as possible to well-maintained course greens: smooth, uniformly turfed, firm but not hard, well defined and free of all major pest problems. Amenities are to be uniform, clean and in good repair.

Mowing frequency	Daily
Mowing equipment	Walk/behind midweek + Triplex week-ends
Rolling	As required to maintain green speed
Cutting height	2.5mm – 4mm
Daily Putting speed	9 – 11
Cups changed	2 x per week
Divots repaired	2 x per week
Flags poles	2 foot specialised putting green flags
Cups	Aluminium

Range Landing Area (Fairway)

- **Overview:** Range landing areas are to be clean, uniformly turfed and mowed, weed free and well marked to direct players. Nets and screens, when used, are to be in good repair, and uniformly and neatly trimmed.

Mowing frequency	2 x per week in warm season & weekly during cool season
Mowing equipment	5 x cylinder light fairway mower
Cutting height	8mm – 12mm
Yardage markers	Yes

Practice Tee

- **Overview:** All practice tees are to be smooth, completely turfed within the current line location, level, firm but not hard, clean, properly directed. Amenities are to be in good condition and repair, consistent and uniform. Mats, if used, are to be clean and in good repair and replaced as necessary to ensure quality.

Mowing frequency	2 x per week in warm season & weekly during cool season
Mowing equipment	Triplex
Cutting height	7mm – 10mm
Tee markers changed	Daily in conjunction with flag system
Divots repaired	2 x per week
Club washers	Yes
Bag racks	Yes
Sand box & rubbish bin	Yes
Seats	Yes
Teeing area location moved	Daily

Attachment 03:

Geotechnical Assessment of Fairways

27 November 2018

Waterbrook Lifestyle Resort
Attn: Nicholas Turner
By email

Dear Nicholas,

**RE: EMERGENCY VEHICLE TRAFFICABILITY: PROPOSED SENIORS LIVING DEVELOPMENT,
CABBAGE TREE ROAD, BAYVIEW, NSW**

I refer to Martens & Associates Geotechnical and Acid Sulfate Soils Assessment report, referenced P1706099JR02V03 and dated August 2018 ('MA 2018'), prepared for the proposed seniors living development at the north western portion of Lot 1 in DP 662920, Cabbage Tree Road, Bayview, NSW ('the site').

I understand that a portion of the site is identified as bushfire prone (RFS NSW, 2018). It is therefore a requirement for the site to be accessible to emergency vehicles, such as fire trucks. Further advice has been sought in relation to emergency vehicle trafficability of the site.

Site trafficability is dependent on vehicle type, weather conditions and site conditions (e.g. topography and ground conditions). I have been advised by Stuart McMonnies (Building Code & Bushfire Hazard Solutions) that an emergency vehicle of approximately 15 tonne GVM will access the site, adjacent to the tree line along fairways 5 and 6. Considering the presence of typically firm to stiff clay / sandy clay, silty clay and sandy silt at shallow depths (MA 2018), I am of the opinion that:

- o In dry conditions and / or following limited rainfall, this area, and the majority of the site, is capable of accommodating a 15 tonne fire truck.
- o In wet conditions, resulting in saturated soil conditions, accessibility will be reduced. Caution should be used, particularly where soils are exposed (i.e. without vegetation cover) and when traversing slopes of greater than 10°.

For and on behalf of

MARTENS & ASSOCIATES PTY LTD



RALPH ERNI

B.Sc. Eng (Civil) M.Eng. (Geo) MIEAust CPEng NER APEC Engineer IntPE(Aus)

Senior Geotechnical Engineer

World Class Sustainable Engineering Solutions

Environmental

EIS & REF
Streams & rivers
Coastal
Groundwater
Catchments
Bushfire
Monitoring

Geotechnics

Foundations
Geotechnical survey
Contamination
Hydrogeology
Mining
Terrain analysis
Waste management

Water

Supply & storage
Flooding
Stormwater & drainage
Wetlands
Water quality
Irrigation
Water sensitive design

Wastewater

Treatment
Re-use
Biosolids
Design
Management
Monitoring
Construction

Civil

Earthworks
Excavations
Pipelines
Roads
Pavements
Parking
Structures

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