

Our Ref: A17041B

1 June 2017

Marchese Partners International Pty Ltd
Level 7, 107 Mount Street
North Sydney NSW 2060



Attention: Mr Elias Khamis

Dear Elias

**Re: Bushfire Constraints Assessment for a Site Compatibility Certificate
Beaconsfield Road, Chatswood (Lot 163 DP 752067)**

Travers bushfire & ecology has been requested to undertake a bushfire constraints assessment for a proposed seniors living development within Part Lot 163 DP 752067, Part Lot 1 DP 651667, Part Lot 1 DP 1124646 and Part Lot 22 DP 626634, Beaconsfield Road, Chatswood.

1. SITE DETAILS AND PROJECT DESCRIPTION

Table 1 – Site Details

Location	Chatswood Golf Course, Beaconsfield Road, Chatswood
Size	Approximately 1.9 ha
Local government area	Willoughby
Grid reference GDA-56	330010E 6258340N
Elevation	Approximately 20-40m AHD
Topography	Situated on a moderately steep north-east, east and south-easterly aspect. Topography has been modified to form at least two rock terraces each between 4-8 metres high.
Catchment and drainage	Drainage via overland flow into constructed ditches and piped infrastructure. Ultimate discharge is likely to be into Lane Cove River.
Vegetation	Landscaped Gardens – some areas are poorly managed.
Existing land use	Curtilage and car parking for the existing Golf Clubhouse
Clearing	>98% of the original canopy vegetation has been cleared and replaced by landscaped gardens

The proposal is to construct a seniors living development consisting of Independent Living Units (ILUs) with parking and associated ancillary facilities over the existing club house facility. A temporary club house is proposed to be constructed within the south-western corner of the site (refer Figure 1). Figure 2 depicts the preliminary design for the seniors living facility.

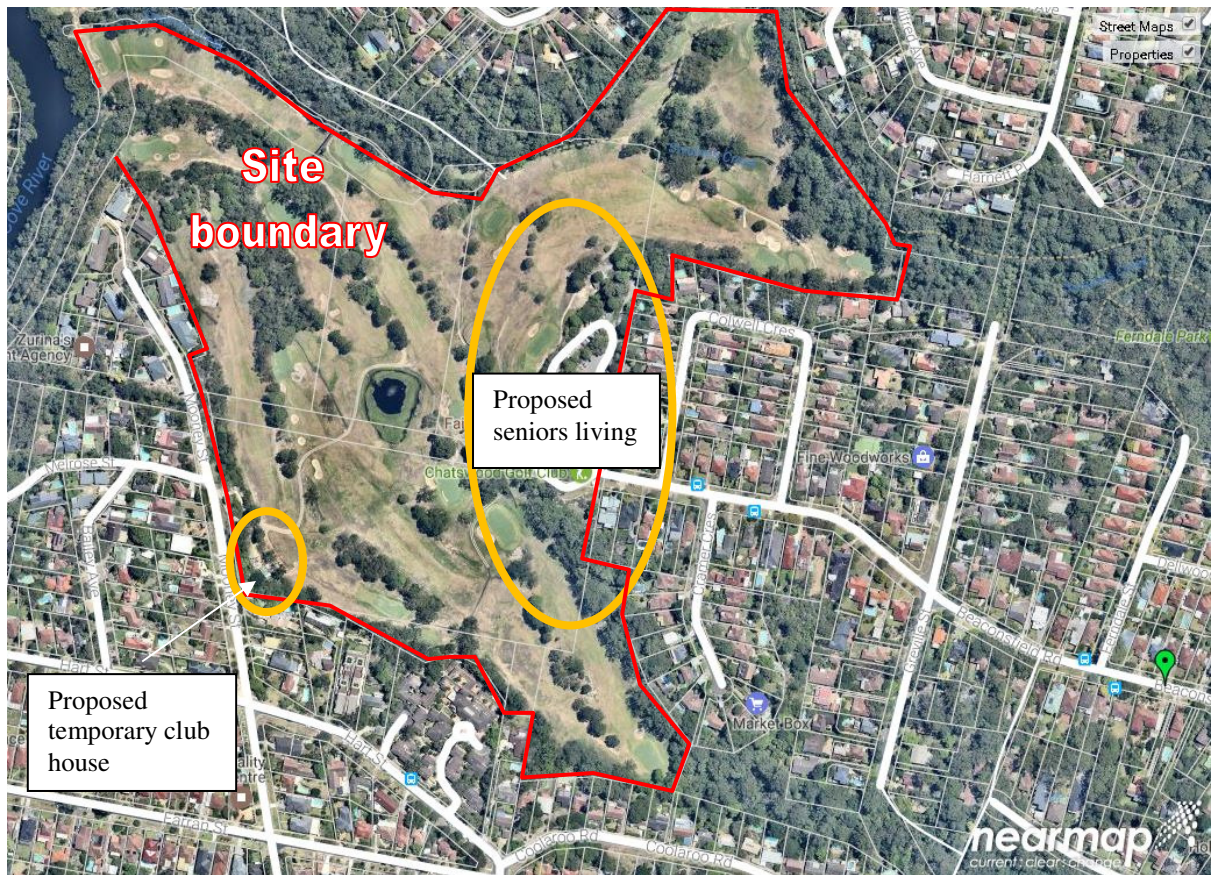


Figure 1 – Aerial Photograph



Figure 2 – Preliminary proposal (seniors living)

2. BUSHFIRE CONSTRAINTS

A preliminary assessment of the bushfire constraints for the future development of the site has been undertaken in order to identify asset protection zones (APZ) requirements and to determine the available area for the development of habitable dwellings on the site.

Advice has also been provided in relation to building construction, access, water supply and emergency management in compliance with the NSW Rural Fire Service land development policy document *Planning for bush fire protection, 2006 (PBP)*.

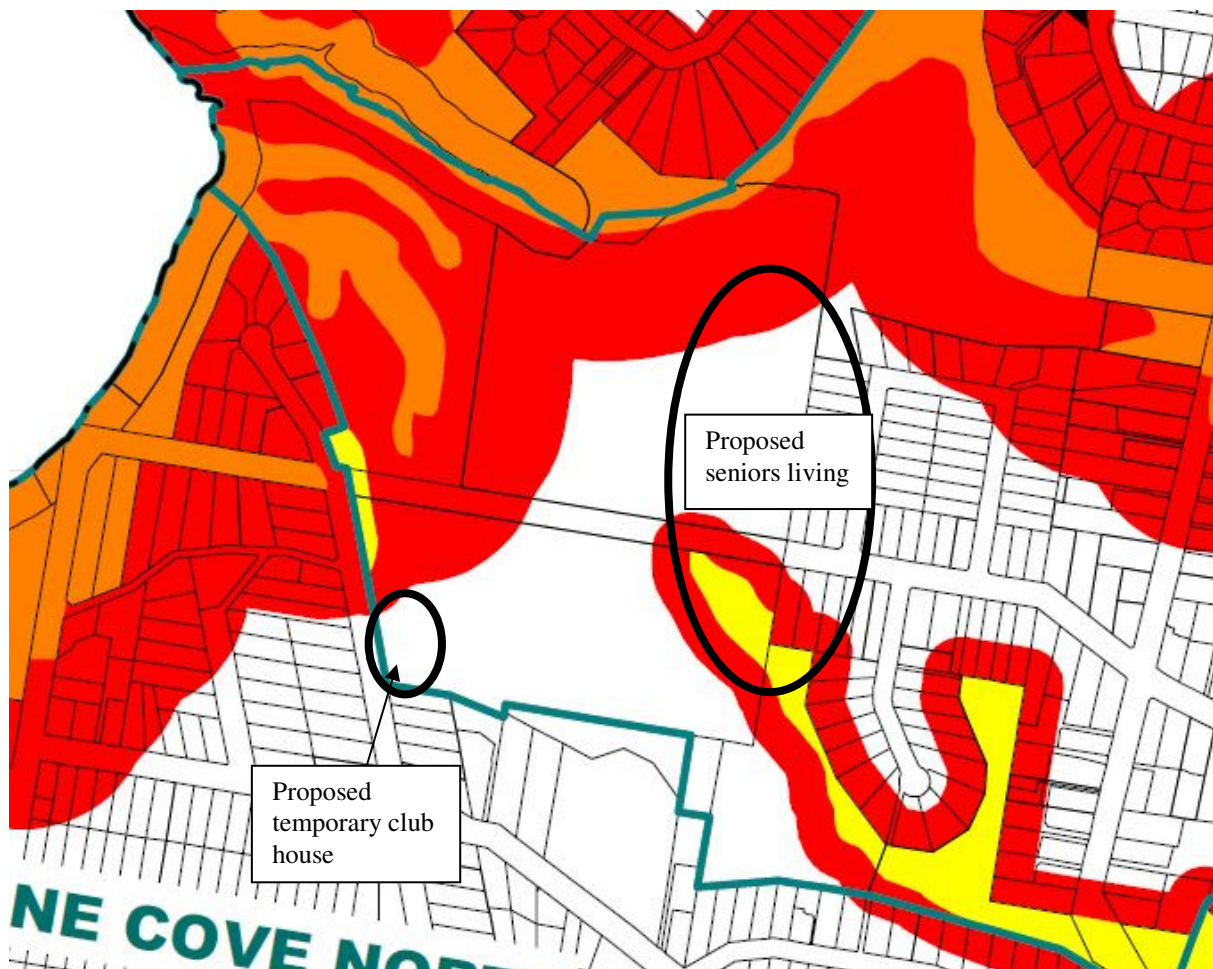


Figure 3 – Bushfire prone land map
(Source: Willoughby Council Bushfire Prone Land Map, 24/4/2003)

We can advise that the property is located on land mapped by *Willoughby Council* as being bushfire prone (refer Figure 3). As a result, Section 100B of the *Rural Fires Act* will trigger the need for an integrated referral to the *NSW Rural Fire Service (RFS)* and an assessment against *PBP* for any future development application within the site. This will also require the *RFS* to consider issuing a bushfire safety authority.

2.1 Special Fire Protection Purpose Developments

The proposal involves the construction of independent living units under the seniors housing SEPP. *PBP* identifies this type of development as a special fire protection purpose (SFPP) development. In addition the temporary club house is considered a Class 9b 'assembly' building under the Building Code of Australia. As a result the aims and objectives applicable to a SFPP must also be considered for the club house.

The nature of SFPPs means that occupants may be more vulnerable to bushfire attack for one or more of the following reasons:

- They may have reduced capacity to evaluate risk and to respond adequately to the bushfire threat.
- They may present organisational difficulties for evacuation and / or management.
- They may be more vulnerable through stress, anxiety and smoke impacts arising from bushfire threat.
- Supervision during a bushfire may be difficult.

The nature of this development may result in difficulties when evacuation is required. These residents cannot generally be expected to defend the property from bushfire attack. As a result, this type of development places residents into a greater risk category when compared to regular residential developments.

2.2 Aims and Objectives of PBP

PBP aims to provide for the protection of human life (including fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on site amenity and protection of the environment.

More specifically, the aims and objectives for all development located on bushfire prone land are required to provide:

1. Afford occupants of any building adequate protection from exposure to a bushfire.
2. Provide for a defensible space to be located around buildings.
3. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition.
4. Ensure that safe operational access and egress for emergency service personnel and residents is available.
5. Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ.
6. Ensure that utility services are adequate to meet the needs of fire fighters (and others who may assist in bushfire fighting).

As the development is a type of development regarded by the *RFS* as a special fire protection purposes development, *PBP* requires additional objectives to be considered.

These include the need to:

7. Provide for the special characteristics and needs of occupants. Unlike residential subdivisions, which can be built to a construction standard to withstand the fire event, enabling occupants and fire fighters 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.
8. 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 fire fighters 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.

In all respects, the future development of this land must adhere to these objectives to ensure approval by the *NSW RFS* and the issue of a bushfire safety authority.

2.3 Asset Protection Zones

The following provides advice in terms of the minimum required APZs based on ensuring future residents and/or visitors to the clubhouse are not exposed to a radiant heat flux exceeding $10kW/m^2$. The size of the APZ is assessed in terms of the bushfire hazard – vegetation and topography.

Bushfire hazards affecting the property have been determined in the field as remnant forest based on the small size of the vegetation parcels and narrow fire run potential.

The topography surrounding the proposed independent living units been determined as level to 18 degrees downslope. The topography surrounding the temporary club house is level.

Table 2 and Schedule 1 & 2 attached provide an indication of the required APZs for the development, relative to slope and vegetation characteristics for the proposed development, as well as the APZ provided based on the current concept plan.

Table 2 – Bushfire Attack Assessment

Aspect	Predominant vegetation within 140m of development	Effective slope of land	APZ required	APZ provided
Independent living units				
North-east	Remnant forest (see Note 1)	Level	30m	30m
South-east	Remnant forest (see Note 1)	18 ° D	42 (refer Note 2)	42m
Temporary club house				
North	Remnant forest	Level	20m	20

Notes: * Slope is either 'u' meaning upslope or 'c' meaning cross slope or 'd' meaning downslope

Note 1: *PBP* describes remnant vegetation as a parcel of vegetation with a size of less than 1ha or a shape that provides a potential fire run directly towards a building not exceeding 50m. The vegetation to the north-east and south-east exhibits these qualities and therefore the threat posed is considered low and APZ setbacks for this aspect are the same as for the rainforests category outlined in *PBP*.

Note 2: A performance based assessment using Appendix B of *AS3959* was undertaken to determine the required APZ (equivalent to $<10kW/m^2$) based on remnant vegetation (*PBP* fuel load 8/10t/ha) on a downslope of 18° and flame width of 30m. The results of the assessment were prepared using the bushfire attack assessor (BFAA) developed by *Newcastle Bushfire Consulting* and will be included in any future development application.

2.4 Hazard Management

Future development is to ensure that the APZ (building setback) and landscaping surrounding the buildings is (as depicted in Schedule 1 attached):

- Managed in accordance with *NSW RFS* document *Standards for Asset Protection Zones* available from www.rfs.nsw.gov.au by following the link 'Publications' and 'Hazard Reduction' and that:
- Landscaping within the property is to be undertaken in accordance with Appendix 5 of *PBP* also available from www.rfs.nsw.gov.au by following the link 'Publications' and 'Building in a Bush Fire Prone Area'.

Development types permissible within the APZ area (minimum building setback) includes 'some' non-habitable buildings (i.e. Class 10 buildings such as sheds and storage areas) access roads, parking areas, vegetable gardens landscaped areas or similar types of managed facilities.

The APZ to the south-west of the independent living units does encroach upon land with slopes >18 degrees. In accordance with the acceptable solutions under PBP APZ's are to be avoided where slopes are greater than 18 degrees due to potential problems and practicality associated with maintenance and the potential for crown fires to develop.

The impact of crown fires developing and impacting the development is negated by the angle of the slope and potential fire run which will direct fire intensity away from the development.

In terms of the practicality and soil stability, this is negated by some degree by the rock benches which provide a natural terrace therefore preventing soil erosion. It is recommended however that a geo-technical report is prepared for the APZ areas to ensure site stability. The geo-technical report is to be submitted with any future DA where the APZ is located on slopes of >18 degrees.

Generally maintenance of the APZ within the steep land (>18 degrees) will be undertaken using hand machinery only. Tree removal on slopes of >18 degrees may be needed in some areas (to ensure a canopy separation of 2-5m) however pruning can also be used to ensure at least 75% of original canopy cover is retained.

2.5 Construction Standards

This APZ (building setback) as depicted in Schedule 1 is based on ensuring building occupants are not exposed to a radiant heat threshold of $>10kW/m^2$.

Future habitable buildings are to be built outside of the asset protection zone (building setback) as depicted in the Schedules attached. Buildings within 100m of the unmanaged vegetation areas are to be constructed to BAL 12.5 rating in accordance with *Australian Standards AS3959 (2009) Construction of buildings in bushfire-prone areas*, with addition construction requirements as outlined within Addendum Appendix 3 of *PBP*. Note: There is no BAL 10 in AS3959.

2.6 Access

The *intent of measures* required by the *RFS* for internal roads is “to provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area”.

The primary access point to the development is via Beaconsfield Road which provides an egress route to the east, away from the direct threat of bushfire. Firefighting access to the bushland vegetation (at the northern and southern ends of the development site) should also be provided either via the internal road system or alternatively via fire trail or maintenance track.

In accordance with PBP any future internal access road should provide for a minimum 6.5m width. Parking should not obstruct this minimum width. The concept plans provided comply with the minimum ‘acceptable’ width requirements as well as providing turning heads in compliance with the performance criteria.

Table 3 below outlines the requirements for compliance with the performance criteria for public roads.

Table 3 – Performance Criteria for Internal Roads (Source: PBP pg. 35)

Performance Criteria	Acceptable Solutions
Internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle.	Internal roads are two-wheel drive, sealed, all weather roads.
	Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8m minimum curb to curb) and shoulders on each side, allowing traffic to pass in opposite directions.
	Roads are through roads. Dead end roads are not more than 100m in length from a through road, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead end.
	Traffic management devices are constructed to facilitate access by emergency services vehicles.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
	Curves have a minimum inner radius of 4m and are minimal in number to allow for rapid access and egress.
	The minimum distance between inner and outer curves is 6m.
	Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.
	Cross fall of the pavement is not more than 10 degrees.
	Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than storm surge).
	Roads are clearly sign posted and bridges clearly indicate load ratings.
	The internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

2.7 Water Supply

Water supply provisions on site are to comply with the following acceptable solutions:

Table 4 – Performance Criteria for Reticulated Water Supplies (Source: *PBP* pg. 37)

Performance criteria	Acceptable Solutions
Water supplies are easily accessible and located at regular intervals	<p>Access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads.</p> <p>Fire hydrant spacing, sizing and pressures comply with AS2419.1 - 2005. Where this cannot be met, the <i>RFS</i> will require a test report of the water pressures anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.</p>

2.8 Gas Supply

Gas supply provisions on site are to comply with the following acceptable solutions:

Table 5 – Performance Criteria for Reticulated Water Supplies (Source: *PBP* pg. 37)

Performance criteria	Acceptable Solutions
Location of gas services will not lead to the ignition of surrounding bushland land or the fabric of buildings	<p>Reticulated or bottled gas bottles are to be installed and maintained in accordance with AS 1596 – 2002 and the requirements of relevant authorities. Metal piping is to be used.</p> <p>All fixed gas cylinders are to be kept clear of flammable materials and located on the non-hazard side of the development.</p> <p>If gas cylinders are to be kept close to the building the release valves must be directed away from the building and away from any combustible material, so that they do not act as a catalyst to combustion. .</p> <p>Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used</p>

2.9 Emergency and Evacuation Planning

Table 6 outlines the required acceptable solutions for emergency procedures:

Table 6 – Performance Criteria for Emergency and Evacuation Planning (Source: PBP pg. 37)

Performance criteria	Acceptable Solutions
An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area	An emergency / evacuation plan is prepared consistent with the RFS <i>Guidelines for the Preparation of Emergency /Evacuation Plan</i> . <i>Note: The applicant should provide a copy of the above document to the local Bush Fire Management Committee for their information prior to the occupation of any accommodation of a SFPP.</i>
Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan.	An Emergency Planning Committee is established to consult with staff in developing and implementing an Emergency Procedures Manual. Detailed plans of all Emergency Assembly Areas including 'onsite' and 'offsite' arrangements as stated within AS3745 are clearly displayed, and an annual trial emergency evacuation is conducted.

Should you require further assistance please contact Senior Bushfire Planner, Nicole van Dorst or the undersigned on 02 4340 5331 or at info@traverseecology.com.au.

Yours faithfully



John Travers
BA Sc. / Ass Dip / Grad Dip / BPAD-Level 3-15195 (FPA)
Managing Director – **Travers bushfire & ecology**



**Travers bushfire & ecology employs a
Bushfire Planning and Design (BPAD) Accredited Practitioner**

John Travers and Nicole van Dorst are BPAD consultants. Both are certified by the Fire Protection Association. FPA Australia administers the Bushfire Planning and Design (BPAD) Accreditation Scheme. The Scheme accredits consultants who offer bushfire assessment, planning, design and advice services. It accredits practitioners who meet criteria based on specific accreditation and competency requirements, including a detailed knowledge of the relevant planning, development and building legislation for each State and Territory. Through the Accreditation Scheme, BPAD Accredited Practitioners are recognised by industry, regulators, fire agencies, end-users and the community as providers of professional bushfire assessment, planning, design and advice services. The Scheme provides an enhanced level of confidence for government and the community that practitioners are accredited by a suitably robust scheme that is administered by the peak national body for fire safety. Note: L3 is the highest level and L1 is the lowest level.



DISCLAIMER: CAD not georeferenced and has been aligned to LPI boundaries. Verification by a registered surveyor is required prior to finalisation.

Legend

- Contours - 1m(source: LiDAR)
- Edge of vegetation
- 70m firefighting access
- Asset Protection Zone (APZ) (building setback)
- Developable area (landscaping to comply with APZ standards)

Aerial source: Nearmap



PROJECT & MXD REFERENCE
Beaconsfield Road, Chatswood
A17041_BF001

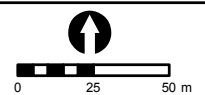
DATE & ISSUE
1/06/2017
Issue 1

SCALE & COORDINATE SYSTEM
1:2,500 @ A4
GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Protection Measures (Independant Living Units)

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Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.



Legend

- Temporary clubhouse site
- Developable area (landscaping to comply with APZ standards)
- Contours - 1m(source: LiDAR)
- Asset Protection Zone (APZ) (building setback)

Aerial source: Nearmap



PROJECT & MXD REFERENCE
Beaconsfield Road, Chatswood
A17041_BF002

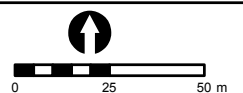
DATE & ISSUE
24/03/2017
Issue 1

SCALE & COORDINATE SYSTEM
1:2,000 @ A4
GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Protection Measures (Temporary Clubhouse)

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Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.