

Bush Fire Assessment Report

Proposed:
**Shop Top Housing,
Retail & Serviced
Apartments**

At:
**1105-1107 Barrenjoey
Road, Palm Beach**

Reference Number: 200233

Prepared For:
MacArthur Projects

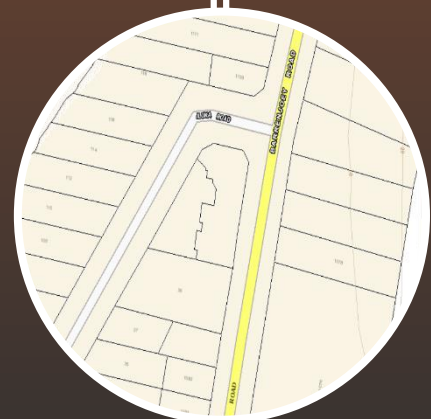
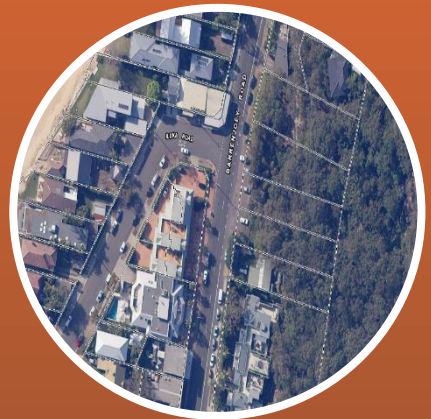
4th December 2020



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Version Control				
Version	Date	Author	Reviewed by	Details
1	11/11/2020	Ian Tyerman	Stuart McMonnies BPAD Accreditation No. 9400	Final Report
2	2/12/2020	Ian Tyerman	Stuart McMonnies BPAD Accreditation No. 9400	Final Report – Updated plans

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959: 2018 'Construction of buildings in bushfire-prone areas'
BAL	Bushfire Attack Level
BSFA	Bush Fire Safety Authority
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches Council
DA	Development Application
ELVIS	Elevation and Depth Foundation Spatial Data
EP&A Act	<i>Environmental Planning and Assessment Act</i> - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection</i> – November 2019
ROW	Right of Way
RF Act	<i>Rural Fires Act</i> - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

Building Code and Bushfire Hazard Solutions P/L has been engaged by Macarthur Projects to provide an independent Bushfire Assessment Report for the proposed development at 1105 - 1107 Barrenjoey Road, Palm Beach (Lots SP 87022 & SP 87024).

The development proposal relates to the construction of a building which will comprise of five (5) retail tenancies, three (3) serviced apartments, eight (8) residential units, a basement carpark and associated works.

The subject site comprises of two (2) existing allotments (zoned B2: Local Centre) which currently contain a mixed residential and commercial development. The existing building will be demolished as part of this development.

The subject property has a street frontage to Barrenjoey Road to the east, Iluka Road to the north and west and a residential apartment building to the south (zoned B2: Local Centre).

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from Category 1 Vegetation, therefore the site is considered 'bushfire prone'.

The subject development includes the establishment of new Special Fire Protection Purpose development (tourist accommodation) on bushfire prone land and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The development is captured under section 100B of the *Rural Fires Act* 1997 and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 44 of the *Rural Fires Regulation* 2013 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development.

In this instance the proposed serviced apartments must satisfy the aim and objectives detailed in Chapter 1 'Introduction' and specific objectives and bushfire protection measures detailed in Chapter 6 'Special Fire Protection Purpose Developments' of PBP.

The proposed retail tenancies and residential units must satisfy the aim and objectives detailed in Chapter 1 'Introduction' and the relevant requirements in Chapter 7 'Residential Infill Development' and Chapter 8 'Other Development' of PBP.

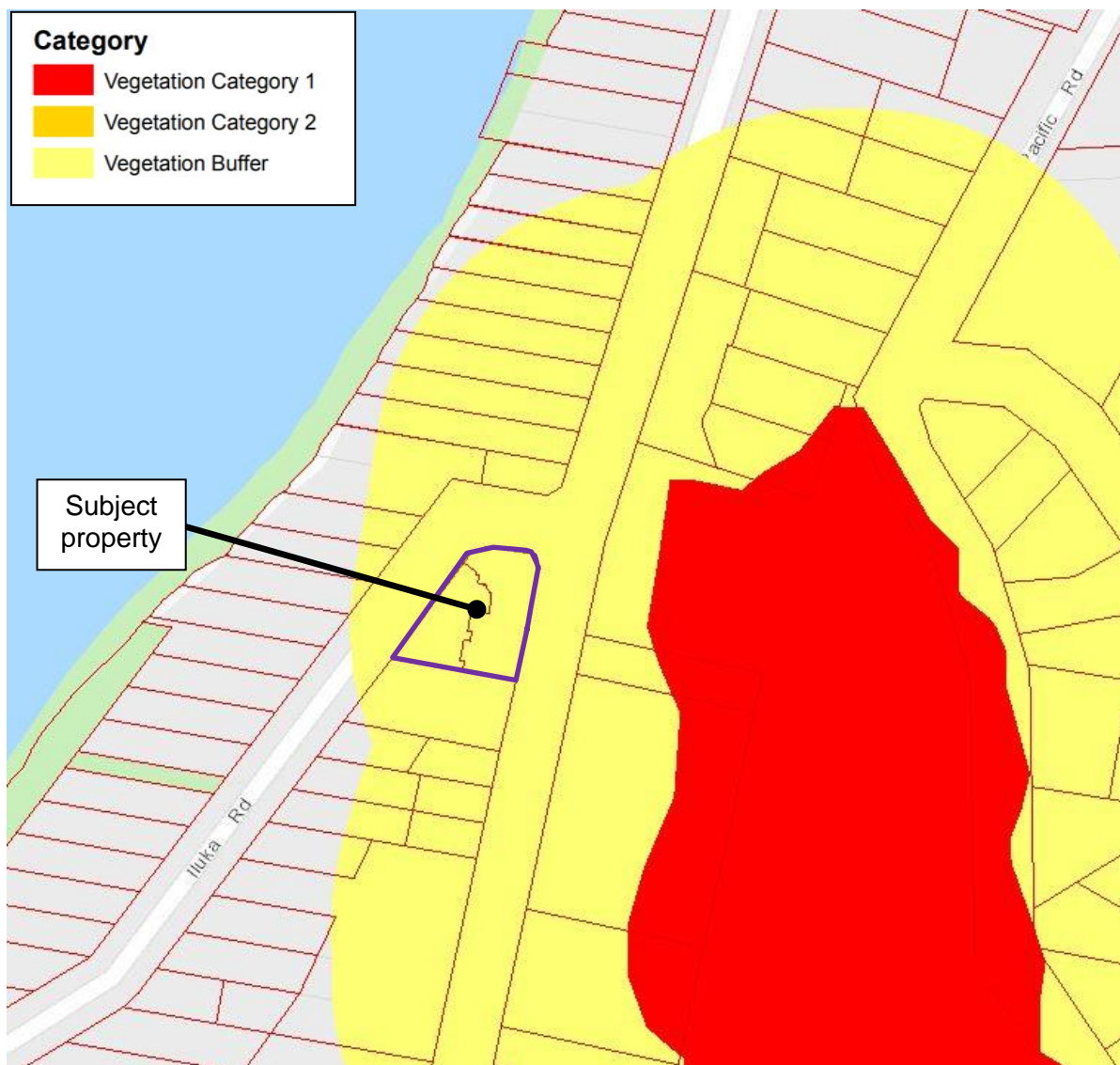


Figure 01: Extract from Northern Beaches Council's Bushfire Prone Land Map

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide MacArthur Projects, the NSW Rural Fire Service and Northern Beaches Council with an independent bushfire assessment together with appropriate recommended bushfire mitigation measures.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire 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 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2019*.

Serviced Apartments	North	East	South	West
Vegetation Structure	Managed land	Forest	Managed land	Managed land
Slope	N/A	30 degrees up *	N/A	N/A
Required Asset Protection Zone (10kW/m²)	N/A	38 metres **	N/A	N/A
Available Asset Protection Zone	N/A	40 metres	N/A	N/A
Significant Landscape Features	Iluka Road / Maintained neighbouring private allotments	Barrenjoey Road / McKay Reserve	Maintained neighbouring private allotments	Iluka Road / Maintained neighbouring private allotments
Bushfire Attack Level	BAL 12.5	BAL 12.5 Note 1	BAL 12.5	BAL 12.5

Note 1: The BAL assessment was determined by design fire modelling consistent with Method 2 Appendix B of AS 3959 – 2018 (report attached).

* Slope capped at 15° in accordance with AS3959 - 2018

** Required APZ determined from bushfire design modelling

Residential Units and retail	North	East	South	West
Vegetation Structure	Managed land	Forest	Managed land	Managed land
Slope	N/A	30 degrees up *	N/A	N/A
Required Asset Protection Zone	N/A	24 metres	N/A	N/A
Available Asset Protection Zone	N/A	>29 metres	N/A	N/A
Significant Landscape Features	Iluka Road / Maintained neighbouring private allotments	Barrenjoey Road / McKay Reserve	Maintained neighbouring private allotments	Iluka Road / Maintained neighbouring private allotments
Bushfire Attack Level	BAL 12.5	BAL 12.5 Note 1	BAL 12.5	BAL 12.5

Note 1: The BAL assessment was determined by design fire modelling consistent with Method 2 Appendix B of AS 3959 – 2018 – the fire modelling report is attached to this document.

In accordance with section 8.3.10 of PBP the measures, including Asset Protection Zones, for Infill Residential Development (Chapter 7) should be used as a base for the development of a package of measures for commercial development.

Compliance Summary of Bushfire Protection Measures			
Bushfire Protection Measure (s7.4 PBP)	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input type="checkbox"/>	<input checked="" type="checkbox"/>	7.02
Construction Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	7.03
Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.04
Water Supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.05
Gas and Electrical Supplies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.05

Asset Protection Zones

The minimum required Asset Protection Zone (APZs) for the serviced apartments were determined from bushfire design modelling to be 38 metres from the bushfire hazard to the east.

The closest part of the closest serviced apartment was found to be located 40 metres from the identified bushfire hazard.

The minimum required Asset Protection Zone (APZs) for the residential apartments was determined from Table A1.12.2 of PBP to be 24 metres from the bushfire hazard to the east.

The closest part of the building envelope to the residential apartments and retail was found to be located 29 metres from the identified bushfire hazard.

The available APZs consist of maintained land within the subject site and existing 'managed land' being Barrenjoey Road, maintained allotments and formed off-street parking.

Construction Level

The highest Bushfire Attack Level to the proposed works has been determined from bushfire design modelling (report attached) consistent with Method 2 of AS3959 – 2018 to be 'BAL 12.5'. The proposed development (including the retail component) is required to comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and the additional construction requirements under section 7.5 of PBP 2019.

The National Construction Code does not provide for any bush fire specific performance requirements for Class 5 to 8 structures and as such Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018 does not apply as a set of 'deemed to satisfy' provisions.

Section 8.3.1 of PBP 2019 states:

Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water and services, and emergency and evacuation planning:

- *to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*
- *to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;*
- *to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
- *provide for the storage of hazardous materials away from the hazard wherever possible.*

The general fire safety construction provisions (of the NCC) are taken as acceptable solutions however construction requirements for bush fire protection will need to be considered on a case-by-case basis.

We are satisfied that in combination with the recommendations contained within this assessment that the proposal will satisfy the above objectives.

5.0 Aerial view of the subject allotment



Figure 02: Aerial view of the subject area C/- Nearmap – October 2020

6.0 Site Assessment

6.01 Location

The subject property is known as 1105 - 1107 Barrenjoey Road, Palm Beach (Lots SP 87022 & SP87024) and comprises of two (2) existing allotments (zoned B2: Local Centre) located within Northern Beaches Councils local government area.

The subject property has a street frontage to Barrenjoey Road to the east, Iluka Road to the north and west and a residential apartment building to the south (zoned B2: Local Centre).

The vegetation identified as posing a bushfire hazard is within vegetated allotments and McKay Reserve (zoned RE1: Public Recreation and E2: Environmental Conservation) to the east.



Photograph 01: View west across Barrenjoey Road toward the subject property



Figure 03: Extract from street-directory.com.au

6.02 Vegetation

The grounds within the subject site were found to comprise of landscaped gardens and mown lawns.

In accordance with Appendix 1 'Site Assessment Methodology' of PBP we have undertaken an assessment of all vegetation formations within 140 metres of the subject site for each aspect as per Keith (2004).

The vegetation identified as posing a bushfire hazard is within vegetated allotments and McKay Reserve (zoned RE1: Public Recreation and E2: Environmental Conservation) to the east.

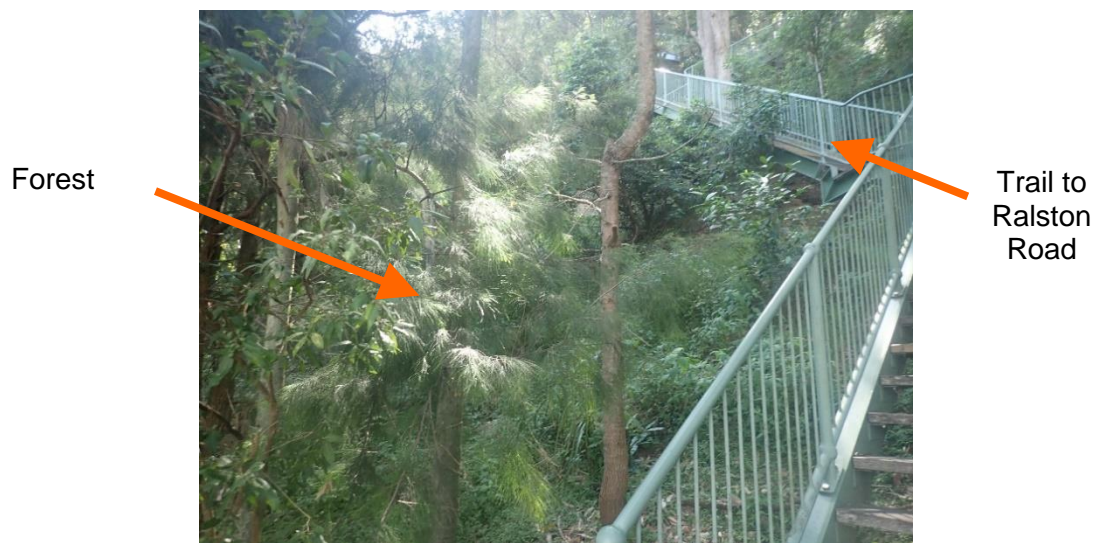
The vegetation posing a hazard to the east was found to consist of trees 10 - 20 metres in height with 30 - 70% foliage cover, the understorey consisted of small trees, shrubs and exotics. The vegetation to the east was also found to have a high occurrence of weeds species located in the understorey adjacent to Barrenjoey Road.

The vegetation to the east is also identified on vegetation mapping (SydneyMetroArea_v3_2016_E_4489) as being Pittwater Spotted Gum Forest.

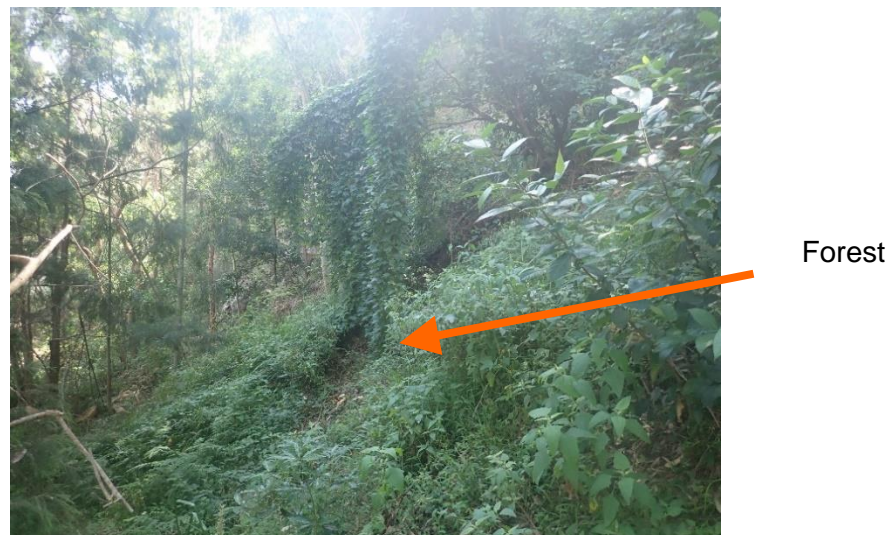
For the purpose of assessment we have determined the vegetation to the east to be Forest (Southern Lowlands Wet Sclerophyll Forest).



Figure 04: Aerial view of the subject area overlaid with vegetation assessment



Photograph 02: View along the trail to Ralston Road within McKay Reserve



Photograph 03: View into the hazard to the east



Photograph 04: View into the hazard to the east

6.03 Slope and Topography

The slope that would most significantly influence bushfire behaviour must be assessed for a distance of 100 metres from within the bushfire hazards. The most significant bushfire impact from east is expected to be a bushfire travelling down slope toward the subject building.

The slope that would **most significantly** influence bushfire impact was determined onsite using an inclinometer and verified from topographic imagery to be:

- 30 degrees up slope within the hazard to the east



Figure 05: Extract from ELVIS – Geoscience Australia (1m Contours)

6.04 Fire Weather

All development which attracts an Asset Protection Zone under PBP requires the identification of the relevant Forest Fire Danger Index (FFDI). The FFDI required to be used for development assessment purposes is based on the local government boundaries, being Northern Beaches Council in this instance.

In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017) Northern Beaches Council forms part of the Greater Sydney Region Fire Weather District and attracts an FFDI of 100.

7.0 Bushfire Assessment

7.01 Planning for Bush Fire Protection - 2019

Planning for Bush Fire Protection – 2019 (PBP) is applicable to development located on land determined as being 'bushfire prone' in accordance with the local Bushfire Prone Land Map.

Bushfire prone land are defined as those areas;

- containing or within 100m of Category 1 Vegetation; or
- containing or within 30m of Category 2 Vegetation.

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from Category 1 Vegetation, therefore the site is considered 'bushfire prone'.

The subject development includes the establishment of new Special Fire Protection Purpose development (tourist accommodation) on bushfire prone land and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The development is captured under section 100B of the *Rural Fires Act* 1997 and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 44 of the *Rural Fires Regulation* 2013 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development.

In this instance the proposed serviced apartments must satisfy the aim and objectives detailed in Chapter 1 'Introduction' and specific objectives and bushfire protection measures detailed in Chapter 6 'Special Fire Protection Purpose Developments' of PBP.

The proposed retail tenancies and residential units must satisfy the aim and objectives detailed in Chapter 1 'Introduction' and the relevant requirements in Chapter 7 'Residential Infill Development' and Chapter 8 'Other Development' of PBP.

As the proposed building does not exceed three storeys in height section 8.2.2 – Multi-storey residential development has not been applied.

7.02 Specific Objectives

Serviced Apartments:

The following table lists the specific objectives for Special Fire Protection Purpose development in accordance with section 6.2 of PBP applicable to the hotel and childcare component of the proposal and our comments on compliance or otherwise.

Specific Objective	Comment
<i>minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;</i>	The proposal exceeds the minimum required Asset Protection Zones for SFPP development which are larger to provide emergency service personnel sufficient space to undertake operations including supporting or evacuating occupants.
<i>provide an appropriate operational environment for emergency service personnel during firefighting and emergency management;</i>	Barrenjoey Road provides direct access to the identified bushfire hazard for attending fire services and is considered the logical fire fighting platform. The proposal also provides APZs in excess of the minimum requirements and good operational space around the proposed serviced apartments.
<i>ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and</i>	Barrenjoey Road provides an existing carriageway in excess of the requirements for Perimeter Roads as described in Table 6.8b of PBP. The external utility providers (e.g. Sydney Water) have systems in place to cater for increased demand as necessary.
<i>ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.</i>	This assessment includes a recommendation that a Bushfire Emergency Management Plan be prepared either as a collective for the site or individually for each new tenancy.

Retail and Residential Units:

The following table lists the specific objectives for residential and rural residential subdivisions with a dwelling entitlement in accordance with section 5.2 of PBP and our comments of the proposal compliance or otherwise.

Specific Objective	Comment
<i>minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);</i>	The proposal has no direct interface with a bushfire hazard and subsequently the proposal does not result in any increased perimeter of the property to a bushfire hazard. In addition the proposal is consistent with the existing development pattern within the subject locality.
<i>minimise vegetated corridors that permit the passage of bush fire towards buildings;</i>	The subject site does not contain a bushfire hazard and there are no conservation areas or vegetated corridors proposed as part of this application.

Specific Objective	Comment
<i>provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;</i>	The proposed building is not located on a ridge-top or on steep slopes.
<i>ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;</i>	<p>The closest point of the proposed building was found to be located 29 metres from the identified bushfire hazard, exceeding the minimum required APZ.</p> <p>The separation from the identified bushfire hazard includes a formed road (Barrenjoey Road) which is serviced by existing hydrants.</p>
<i>ensure the ongoing maintenance of APZs;</i>	<p>The separation from the identified bushfire hazard includes a formed road (Barrenjoey Road) and managed parking.</p> <p>It is expected that the Asset Protection Zones within the subject site will be enforced by way of a condition of consent, similar to recommendation 2 of this report, as part of this development process.</p> <p>This will ensure ongoing management of the APZs within the site.</p>
<i>provide adequate access from all properties to the wider road network for residents and emergency services;</i>	The most distant external point of the proposed building envelope is within 70 metres of Barrenjoey and Iluka Roads.
<i>provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression;</i>	Attending fire services have comprehensive access to the identified bushfire hazard via Barrenjoey Road and surrounding roads for hazard reduction and / or fire suppression activities.
<i>ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.</i>	<p>Existing in-ground hydrants are available along Barrenjoey Road and surrounding roads for the replenishment of attending fire services.</p> <p>These hydrants are considered to be the logical water supply for fire services undertaking hazard reduction and / or fire suppression activities.</p>

7.03 Bushfire Protection Measures

The following section addresses each Bushfire Protection Measure (BPM) and the proposals compliance or otherwise.

Asset Protection Zones & Landscaping

An Asset Protection Zone (APZ) is an area between the development (in this instance building envelope) and the identified bushfire hazard where the fuels are maintained to a minimum to prevent the spread of fire between a hazard and an asset.

The width of the APZs is determined by the vegetation structure of the identified bushfire hazard, FFDI, effective slope and the type of development (residential development or Special Fire Protection Purpose).

APZs for new Special Fire Protection Purpose development are determined from Table A1.12.1 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m^2 at the closest point of the building envelope.

The minimum required Asset Protection Zone (APZ) for the serviced apartments was determined from bushfire design modelling to be 38 metres from the bushfire hazard to the east.

The closest part of the serviced apartments was found to be located 40 metres from the identified bushfire hazard, exceeding the minimum required APZ.

APZs for increased density are determined from Table A1.12.2 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m^2 at the closest point of the building envelope.

The minimum required Asset Protection Zone (APZ) for the residential units was determined from Table A1.12.2 of PBP to be 24 metres from the bushfire hazard to the east.

The closest part of the building envelope was found to be located 29 metres from the identified bushfire hazard.

The available APZ consists of maintained land within the subject site and existing 'managed land' being Barrenjoey Road and the formed off-street parking and exceed the minimum requirements of PBP.



Figure 06: Overlay showing APZ to the Serviced Apartments



Figure 07: Overlay showing APZ to the Shop Top housing

Access

The subject site has street frontage to Barrenjoey Road to the east and Iluka Road to the west and north. Barrenjoey Road also provides existing perimeter access between the subject site and identified bushfire hazard.

Attending fire services have comprehensive access to the identified bushfire hazard via Barrenjoey Road for hazard reduction and / or fire suppression activities. Barrenjoey Road has hydrant points available at regular intervals adjacent the hazard and subsequently would be the logical fire-fighting platform for attending fire services.

The most distant external point of the proposed building is within 70 metres of Barrenjoey Road and Iluka Road.

We are of the opinion the existing access arrangement are adequate for fire service access and occupant egress.

Services – Water, electricity & gas

Existing in-ground hydrants are available along Barrenjoey Road and Iluka Road for the replenishment of attending fire services. These hydrants are considered to be the logical water supply for fire services undertaking hazard reduction and / or fire suppression activities.

Recommendations will be included to ensure compliance with the electricity and gas services requirements.

Building Construction, siting & design

Australian Standard 3959 – 2018 'Construction of buildings in bushfire-prone areas' (AS3959) specifies construction standards for buildings within various Bushfire Attack Levels as determined by Planning for Bush Fire Protection – 2019.

AS3959 provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ.

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959
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

Table 01: Correlation between bushfire impact and AS3959

The highest Bushfire Attack Level to the proposed building was determined from bushfire design modelling (report attached) consistent with Method 2 of AS3959 – 2018 to be 'BAL 12.5'. The proposed development is required to comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and the additional construction requirements under section 7.5 of PBP 2019.

7.04 Aim & Objectives

The following table details the aim and objectives of Planning for Bush Fire Protection 2019 and the proposals ability to comply.

Aim / Objective	Comment
<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>	With the inclusion of the recommendations made herein it is of our opinion that the aim of PBP has been satisfied.
<i>(i) afford buildings and their occupants protection from exposure to a bush fire;</i>	The closest point of the building envelope was found to be located 29 metres from the identified bushfire hazard and the closest serviced apartment was found to be 40 metres from the bushfire hazard, exceeding the minimum required APZ.
<i>(ii) provide for a defensible space to be located around buildings;</i>	<p>The closest point of the building envelope was found to be located 29 metres from the identified bushfire hazard, which includes the formed Barrenjoey Road.</p> <p>An adequate defensible space is [provided in this instance.</p>
<i>(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	The closest point of the building envelope was found to be located 29 metres from the identified bushfire hazard and in conjunction with the application of BAL 12.5, being the relevant Bushfire Attack Level, will prevent the likely fire spread to the building.
<i>(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<p>The subject site has street frontage to Barrenjoey Road to the north which also provides existing perimeter access between the subject site and identified bushfire hazard.</p> <p>Attending fire services have comprehensive access to the identified bushfire hazard via Barrenjoey Road for hazard reduction and / or fire suppression activities.</p>
<i>(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and</i>	<p>The grounds within the subject site are to be maintained in accordance with the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of <i>Planning for Bush Fire Protection</i> 2019.</p> <p>Any new landscaping is to comply with the provisions of Appendix 4 of PBP.</p>

(vi) ensure that utility services are adequate to meet the needs of firefighters.

Existing in-ground hydrants are available along Barrenjoey Road, Iluka Road and surrounding public roads for the replenishment of attending fire services.

These hydrants are considered to be the logical water supply for fire services undertaking hazard reduction and / or fire suppression activities.

It is therefore of our opinion that the proposal can satisfactorily comply with the aim and objectives of Planning for Bush Fire Protection 2019.

8.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2019. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

General

1. That the proposed development is to comply with the plans prepared by PBD Architects (Project No. 1816, Issue: A, Dated 2020.12.18).

Asset Protection Zones

2. The all grounds within proposed to be maintained in accordance with an Asset Protection Zone (Inner Protection Area) as detailed in the NSW Rural Fire Service's document '*Standards for Asset Protection Zones*' and Appendix 4 of Planning for Bush Fire Protection 2019.

Construction

3. The proposed building shall comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and the additional construction requirements under section 7.5 of Planning for Bush Fire Protection 2019.

Landscaping

3. That any new landscaping is to comply with Appendix 4 of *Planning for Bush Fire Protection 2019*.

Emergency management

4. That a Bushfire Emergency Management Plan be prepared either as a collective for the site or individually for each new tenancy.

Services (where applicable)

Electricity:

5. Any new electrical services must comply with:
 - where practicable, electrical transmission lines are underground.
 - 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 *ISSC3 Guideline for Management Vegetation Near Power Lines*.

Gas:

6. Any new gas services must comply with:

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - *The storage and handling of LP Gas*, the requirements of relevant authorities, and metal piping is used;
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;
- connections to and from gas cylinders are metal;
- polymer-sheathed flexible gas supply lines are not used; and
- above-ground gas service pipes are metal, including and up to any outlets.

9.0 Conclusion

The development proposal relates to the construction of a building comprising of retail, shop top housing and serviced apartments within existing allotments known as 1105 - 1107 Barrenjoey Road, Palm Beach.

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from Category 1 Vegetation, therefore the site is considered 'bushfire prone'.

The subject development includes the establishment of new Special Fire Protection Purpose development (tourist accommodation) on bushfire prone land and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The development is captured under section 100B of the *Rural Fires Act* 1997 and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 44 of the *Rural Fires Regulation* 2013 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

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.

We are therefore in support of the application.

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

Prepared by
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Certificate IV Fire Technology
FPA Australia BPAD Level 3 Accredited Practitioner
BPAD Accreditation No. BPAD9400



10.0 Annexure 01

List of Referenced Documents

Australian Building Codes Board (2019). *National Construction Code Volume Two - Building Code of Australia*. ABCB

ELVIS -Elevation -Foundation Spatial Data. Elevation.fsdf.org.au. Available at: <http://elevation.fsdf.org.au/>

Environmental Planning and Assessment Act 1979

Vegetation Mapping, SydneyMetroArea_v3_2016_E_4489: Accessed at: the Office of Environment and Heritage

https://geo.seed.nsw.gov.au/Public_Viewers/index.html?viewer=Public_Viewers&locale=en-AU

Keith, D. (2004). "Ocean Shores to Desert Dunes" Department of Environment and Conservation, Sydney

NSW Department of Planning and Environment (2019). *Planning Portal*. Accessed at: <https://www.planningportal.nsw.gov.au/>

NSW Rural Fire Service (2019). *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*.

Rural Fires Act 1997

Rural Fires Regulations 2013

Rural Fire Service NSW (2005). *Standards for Asset Protection Zones*

Rural Fire Service NSW (2017). *NSW Local Government Areas FDI*

Plans by PBD Architects (Project No. 1816, Issue: A, Dated 2020.12.18).

Standards Australia (2018). *AS3959 Construction of buildings in bushfire-prone areas*.

Standards Australia (2014). *AS/NZS 1596 The storage and handling of LP Gas*

Acknowledgements to:

Geoscience Australia
Nearmap
Street-directory.com.au

Attachments

Attachment 01: Bushfire Design Modelling



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 11/11/2020

Assessment Date: 26/10/2020

Site Street Address: 1105-1107 Barrenjoey Road, Palm Beach

Assessor: Please Enter Your Name; Please Enter Company Name

Local Government Area: Northern Beaches

Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001/Vesta/Catchpole

Rate of Fire Spread: Noble et al., 1980

Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005

Peak Elevation of Receiver: Tan et al., 2005

Peak Flame Angle: Tan et al., 2005

Run Description: East

Vegetation Information

Vegetation Type: Southern Lowlands WSF (Grassy)

Vegetation Group: Wet Sclerophyll Forests (Grassy)

Vegetation Slope: 15 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 20

Overall Fuel Load(t/ha): 32.8

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 29

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 4.65

Radiant Heat(kW/m2): 9.5

Flame Angle (degrees): 79

Flame Length(m): 9.48

Maximum View Factor: 0.154

Rate Of Spread (km/h): 0.85

Inner Protection Area(m): 18

Transmissivity: 0.809

Outer Protection Area(m): 11

Fire Intensity(kW/m): 14448

Run Description:	East - SFPP APZ		
<u>Vegetation Information</u>			
Vegetation Type:	Southern Lowlands WSF (Grassy)		
Vegetation Group:	Wet Sclerophyll Forests (Grassy)		
Vegetation Slope:	15 Degrees	Vegetation Slope Type:	Upslope
Surface Fuel Load(t/ha):	20	Overall Fuel Load(t/ha):	32.8
Vegetation Height(m):	0.9	Only Applicable to Shrub/Scrub and Vesta	
<u>Site Information</u>			
Site Slope:	0 Degrees	Site Slope Type:	Level
Elevation of Receiver(m):	Default	APZ/Separation(m):	38
<u>Fire Inputs</u>			
Veg./Flame Width(m):	100	Flame Temp(K):	1200
<u>Calculation Parameters</u>			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	100
<u>Program Outputs</u>			
Level of Construction:	BAL 12.5	Peak Elevation of Receiver(m):	4.67
Radiant Heat(kW/m2):	10	Flame Angle (degrees):	81
Flame Length(m):	9.46	Maximum View Factor:	0.112
Rate Of Spread (km/h):	0.85	Inner Protection Area(m):	0
Transmissivity:	0.799	Outer Protection Area(m):	0
Fire Intensity(kW/m):	14448		