



# Bushfire Hazard Assessment

981 Barrenjoey Road Palm Beach 2108 (Lot 100/-/DP509808).



## Project Details

Assessed as:	Infill Development
Assessed by	Matthew Noone Accreditation No. BPAD-PD 25584
Highest BAL on any facade	BAL-12.5
Planning for Bushfire Protection (2006) Compliance	The development conforms to the relevant specification and requirements of Planning for Bushfire Protection in accordance with Section 4.14 of the Environmental Planning and Assessment Act 1979.
Project Description	Proposed Alterations and Additions.
Report Number	BR-197020-A
Date	12/01/2020

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### **DISCLAIMER**

Bushfire Planning & Design cannot be held liable for any loss of life or property in the event of a bushfire. This report has been based on all relevant bushfire codes and regulations with regard to the construction of a building in a bushfire prone area. Bushfire Planning and Design has no control over workmanship and is not always asked by the Principal Certifying Authority prior to the release of an occupation certificate to advise if the construction standards and recommendations in this report have been adhered to. Buildings degrade over time and vegetation if not managed will regrow. In addition construction standards are subject to change. Due to significant variance of bushfire behaviour, we do not guarantee that the dwelling will withstand the passage of bushfire even if this development is constructed to the prescribed standards.

AS3959 (2009) states *"It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature of behaviour of fire, and extreme weather conditions."*

This report reflects our opinions of bushfire risk, expected radiant heat loads and required asset protection zones relating to the proposed development. Our views are based on our interpretation of Planning for Bushfire Protection (2006), AS3959 (2009) and the methodology for site specific bushfire assessment. The Rural Fire Service have a higher authority and can upon their review, increase a nominated BAL-rating or reject any recommendation contained within this report. Any such recommendations made by the RFS take precedence. Our role is intermediary between our Client and the consenting authority. We apply our knowledge of the standards for bushfire protection to provide the best possible outcome for our Client, both from a bushfire safety and financial perspective. Should the RFS modify our recommendations or reject a proposal we will not be held liable for any financial losses as a result.

This document may only be used for the purpose for which it was commissioned. Bushfire Planning and Design accepts no liability or responsibility for any use or reliance upon this report and its supporting material by any unauthorized third party. Outcomes within this report may have arisen due to specific advice from our Client and in relation to the specific development application that this report was prepared for. The validity of this report is nullified if used for any other purpose than for which it was commissioned. Unauthorized use of this report in any form is an infringement of our intellectual property.

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## SECTION 1. BACKGROUND AND BRIEFING NOTES

### 1.1 INTRODUCTION

The subject site whether in whole or part is recorded as bushfire affected on a relevant map certified under Section 10.3 (2) of the Environmental Planning and Assessment Act 1979. The development relates to the development of bushfire prone land and therefore must address the legislative requirements stipulated in Section 4.14 of the Environmental Planning and Assessment Act 1979. The development is required to comply with the New South Wales Rural Fire Service document Planning for Bushfire Protection (2006).

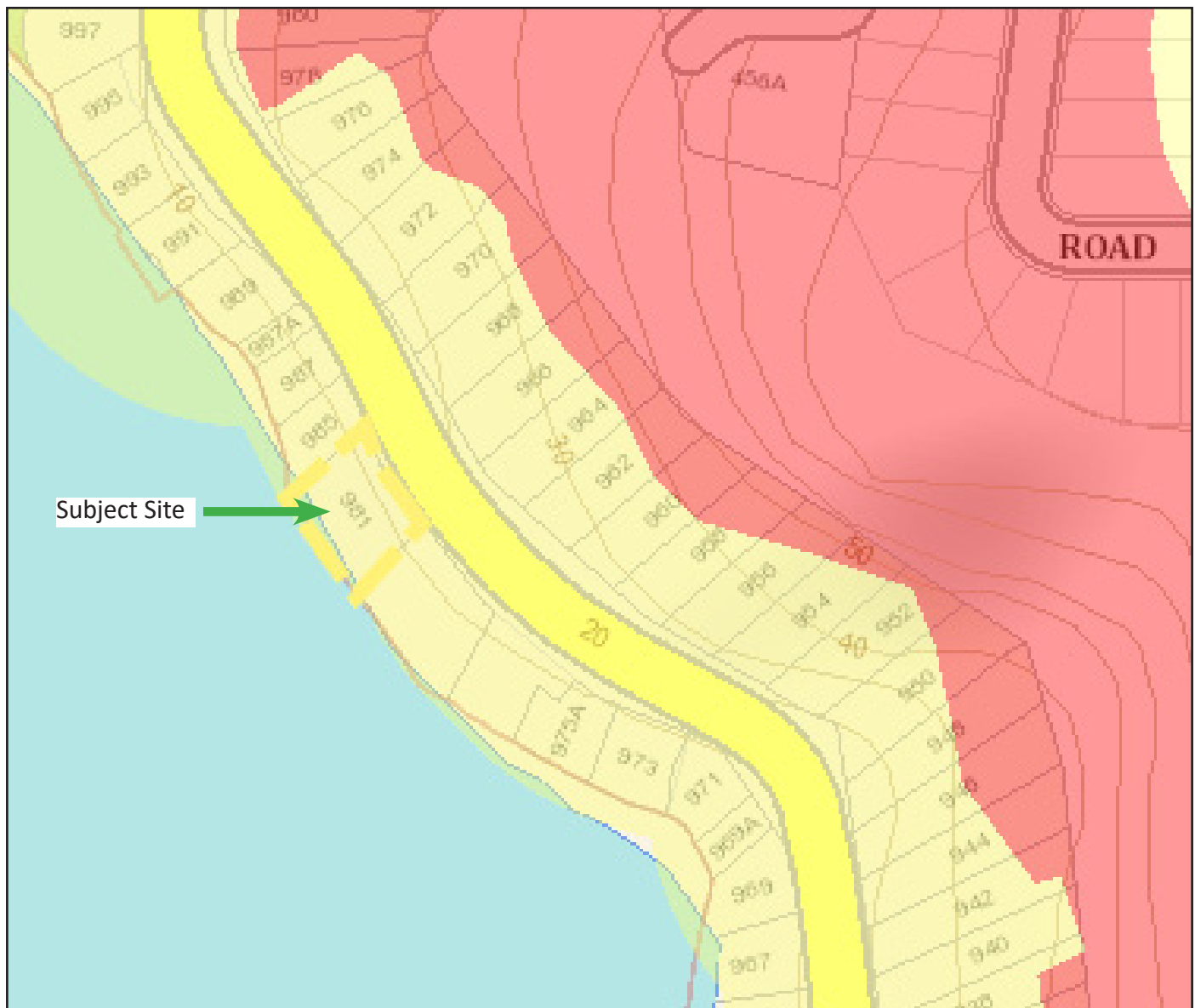
#### Figure A - BUSHFIRE PRONE LAND MAP

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Department of Planning, Industry and Environment ([www.planningportal.nsw.gov.au](http://www.planningportal.nsw.gov.au)).

Certified Bushfire Prone Land Map extract obtained from the Planning Portal managed by the Department of Planning, Industry and Environment. Found at [www.planningportal.nsw.gov.au](http://www.planningportal.nsw.gov.au). The subject site is mapped as bushfire affected.



#### BUSHFIRE PLANNING AND DESIGN

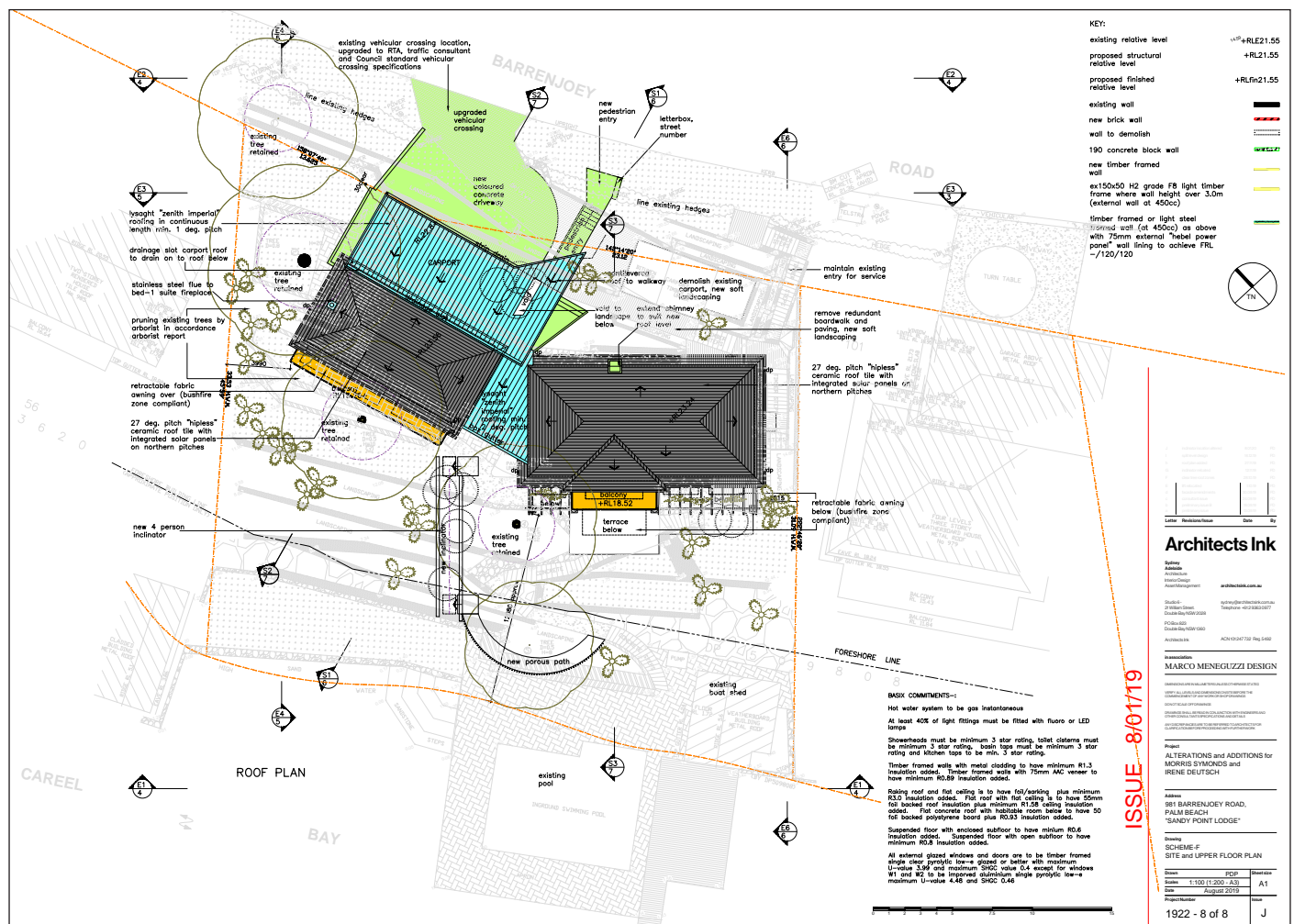
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## 1.2 DEVELOPMENT PROPOSAL

The development relates to the undertaking of alterations and additions to the existing dwelling.



### 1.3 PURPOSE OF THIS REPORT

Development applications on bush fire prone land must be accompanied with a Bush Fire Assessment demonstrating the degree to which the proposed development complies with or deviates from the aims, objectives and performance criteria of Planning for Bushfire Protection 2006 (PBP 2006). The purpose of this report is to address the following;

- To determine the expected fire behaviour and threat to the proposed development.
- To provide the land owner, Northern Beaches Council, the RFS and other relevant stakeholders with a bushfire report that determines the bushfire hazard for the proposed development.
- To identify compliance with the specific objectives and performance requirements of Planning for Bushfire Protection 2006, including Appendix 3 (2010) where applicable.
- To determine the required level of construction required by AS3959 – Australian Standard for the Construction of Buildings in Bushfire Prone Areas.
- Provide bushfire protection recommendations to mitigate the adverse affects from bushfire. The recommendations provided are based on the acceptable solutions stated in PBP (2006).

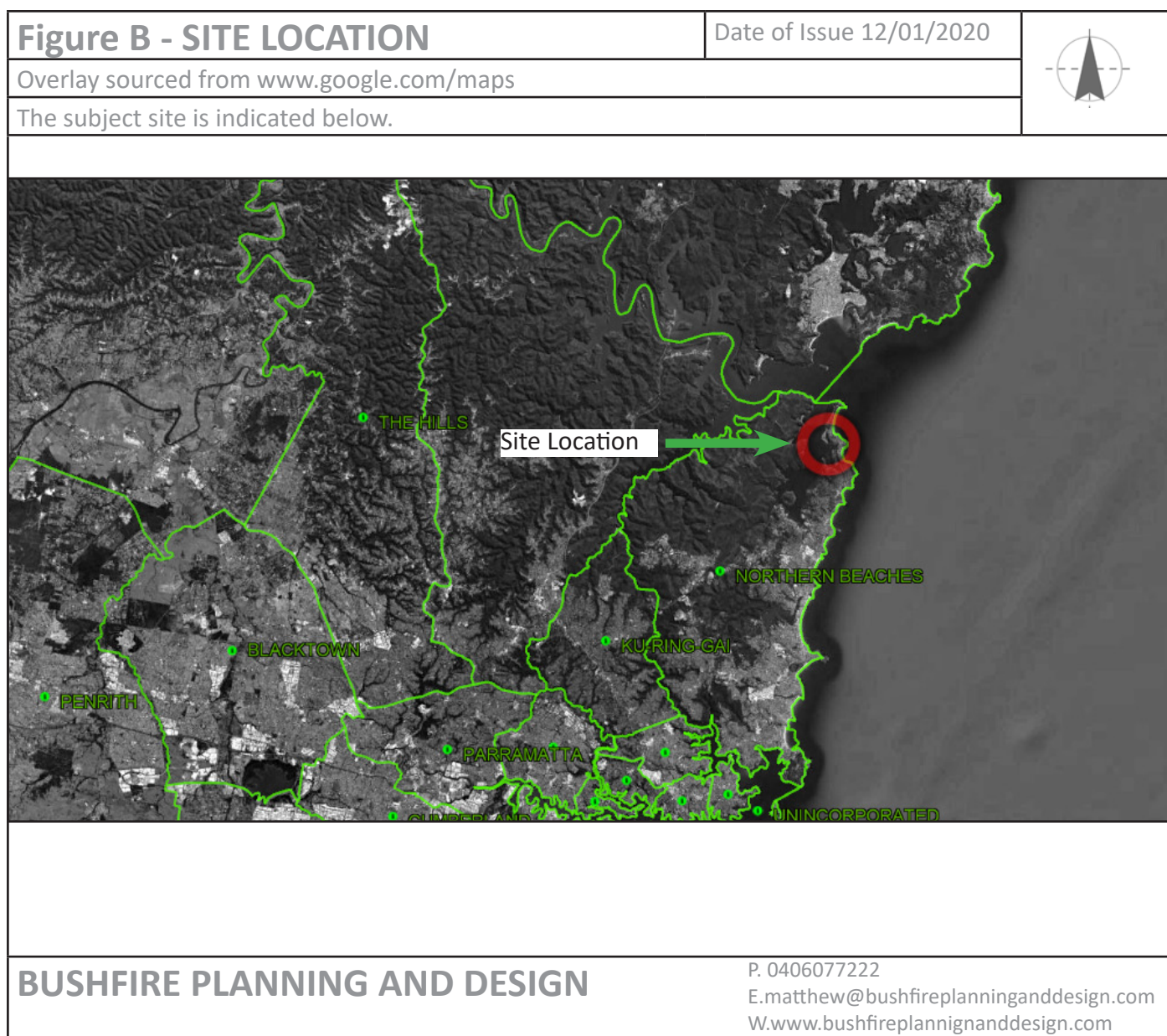


## 1.4 SCOPE OF THIS REPORT

This report has been prepared to accompany the specific development application referred to in this document and as attached in Appendix B. This report has considered all current relevant bushfire legislation, planning instruments, codes and standards for the construction of a building in a bush fire prone areas. For the purpose of this report it is necessary to describe the surrounding vegetation to 140m from the boundary and slope to 100m from the boundary. This report does not directly assess the bushfire hazard on any adjacent site and cannot be used to support any development on an adjoining allotment.

## 1.5 SITE LOCATION AND DESCRIPTION

The subject site is located in a residential area in Palm Beach which is under the jurisdiction of the Northern Beaches Council. Access to the site is from Barrenjoey Road to the east. An existing dwelling is located on the site. The allotment is surrounded by managed residential curtilage to the north and south. Pittwater Estuary is located to the west. Forest vegetation is located steeply up-slope more than 65m to the east. A thin remnant parcel of vegetation is located on the cliff to the east of Barrenjoey Road.



## 1.6 REGULATORY FRAMEWORK

The main legislation, planning instruments, development controls and guidelines that are related to this project are as follows;

### 4.14 Consultation and development consent— certain bush fire prone land

*(1) Development consent cannot be granted for the carrying out of development for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bush fire prone land unless the consent authority:*

*(a) is satisfied that the development conforms to the specifications and requirements of the document entitled Planning for Bush Fire Protection, prepared by the NSW Rural Fire Service in co-operation with the Department of Planning (or, if another document is prescribed by the regulations for the purposes of this paragraph, that document) that are relevant to the development ( “the relevant specifications and requirements”), or*

*(b) has been provided with a certificate by a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment stating that the development conforms to the relevant specifications and requirements. (EPA & A, 1979).*

Class 1, 2, 3, 4, 9 Special Fire Protection Purpose and Class 10a building or deck associated with a Class 1 buildings are required to comply with the Building Code of Australia. The BCA is a performance based code which derives its statutory power from the Environmental Planning and Assessment Act 1979.

The BCA contains both performance requirements and deemed-to-satisfy provisions for all aspects of building, including the construction of buildings in bush fire prone areas. Compliance with the performance requirements of the BCA is achieved by way of a deemed to satisfy solution which is satisfied by;

A	Complying with AS3959, the Australian Standard for the Construction of Buildings in Bushfire Prone Areas except as amended by Planning for Bush Fire Protection; and for Section 9 for Bushfire Attack Level FZ (BAL-FZ); or
B	Complying with the NASH Standard – Steel Framed Construction in Bushfire Areas except—as amended by Planning for Bush Fire Protection; and for buildings subject to Bushfire Attack Level FZ (BAL-FZ); or
C	the requirements above as modified by the development consent following consultation with the NSW Rural Fire Service under section 4.14 of the Environmental Planning and Assessment Act 1979 if required; or
D	the requirements above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

## 2.0 INTRODUCTION

For the purpose of this bushfire assessment, the vegetation is required to be described to a distance of 140m from the boundary and the slope to 100m from boundary. Vegetation type and slope under vegetation are the factors that will significantly affect bushfire behaviour.

'Research has shown that 85% of houses are lost in the first 100m from bushland and that ember attack is a significant form of attack on properties' (RFS 2006).

## 2.1 SLOPE

The effective slope has been assessed for a distance of at least 100m from the proposed development. The slope data has been calculated from 1m LiDAR contours. The source data sets have been captured to standards that are generally consistent with the Australian ICSM LiDAR Acquisition Specifications with require a fundamental vertical accuracy of at least 0.30m (95% confidence) and horizontal accuracy of at least 0.80m (95% confidence). The slope arrows indicated in figure C represent the slope calculated across the length of the arrow direct from the digital elevation model. The calculated slope as shown in figure C has not been manipulated or modified in any way.

## 2.2 PREDOMINANT VEGETATION CLASS

This assessment includes vegetation both within and external to the site boundaries. Where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard shall be used for the purpose of assessment. The combination of vegetation and slope that yields the worst case scenario shall be used.

The predominant vegetation class is the North Coast Wet Sclerophyll Forest and Sydney Coastal Dry Sclerophyll Forest to the east of the site.



State Vegetation Mapping (OEH 2019).



**TABLE 2.3 - BAL ASSESSMENT (To be read in conjunction with Figure C). This table relates the proposed dwelling.**

LGA = Northern Beaches Council	Forest Fire Danger Index = FDI 100		
	EAST-1	EAST-2	ALL DIRECTIONS
Effective slope	58.8% U-S	U-S	Not Applicable
Site Slope	Not Applicable	Not Applicable	Not Applicable
Vegetation classification	Forest	Remnant	Managed Land
Separation from vegetation	48-100m (# > 65m)	23-100m (# >23 m)	-
Modelled flame length	Not Applicable	Not Applicable	-
Required level of construction	BAL-12.5	BAL-12.5	BAL-12.5
Assessment methodology	Method 1	Method 1	-

<sup>1</sup>	<i>Vegetation Classifications are as described in PBP (2006) Table A2.1.</i>
<sup>2</sup>	<i>Site slope is calculated from 1m LIDAR contours.</i>
<sup>3</sup>	<i>APZ required by Acceptable Solutions within Table A2.4 PBP (2006)</i>
<sup>4</sup>	<i>Remnant vegetation having an area of less than 1 hectare in area or a fire run less than 50m towards the subject site.</i>
<sup>5</sup>	<i>Where the direct line of sight between the proposed building and assessed vegetation is obstructed (by a wall or building) the assessed rating can be lowered by one BAL-rating (AS3959 2009 Clause 3.5).</i>
#	<i>Actual dimensional setback from face of building to assessed vegetation.</i>

## EXECUTIVE BAL-ASSESSMENT SUMMARY.

To clarify the findings above, a thin band of remnant vegetation is located on the eastern side of Barrenjoey Road. Beyond the remnant is managed residential curtilage and beyond the managed land is dense forest vegetation. The land to the north and south of the site is managed residential land. Pittwater estuary is located to the west.

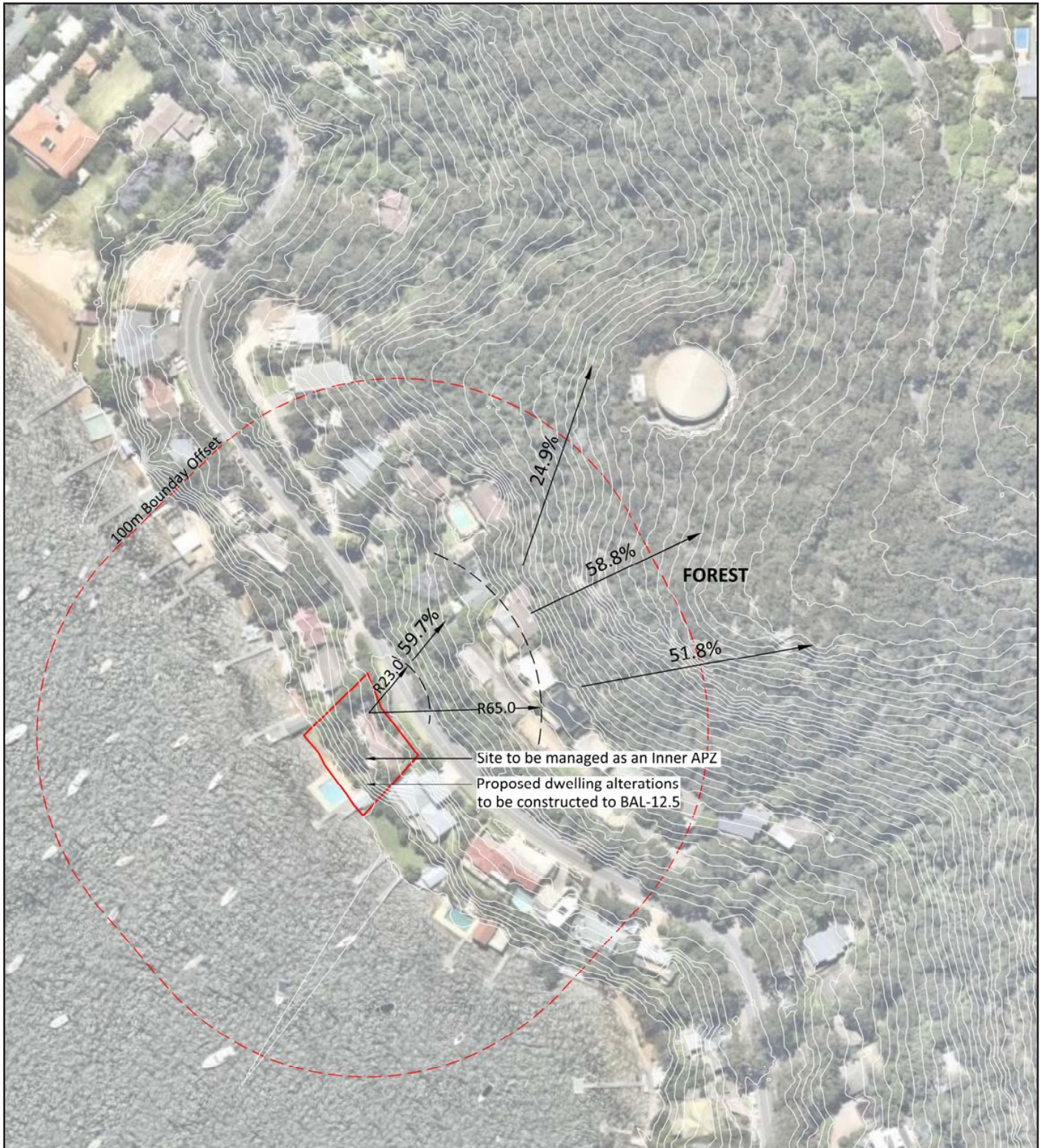
Based on the parameters identified in table 2.3 above, the proposed development is to be constructed to BAL-12.5 as specified in AS3959 (2009).

## Figure C - Site Analysis Drawing

Date of Issue 12/01/2020



Aerial image modified from Near Map ([www.nearmap.com.au](http://www.nearmap.com.au))



- Not used
- Not used
- Not used

### NOTES:

1. The slope data used for this assessment has been based on 1m LIDAR contours.

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## SECTION 3. CONSTRUCTION REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2006)	ACCEPTABLE SOLUTION
<p>It must be demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The construction requirements have been determined in accordance with Planning for Bushfire Protection Appendix 3 2010 and the requirements for attached garages and others structures in Section 4.3.5 (PBP 2006).</p> <p>The proposed development is to be constructed to BAL-12.5 as indicated in figure C and as specified in AS3959 (2009). The building requirements for the specified BAL-rating will mitigate bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.</p> <p>The following BAL-rating specifications are provided as a guide and for general information only. It is the building contractor's responsibility to source a copy of the relevant AS3959 (2009) standard to ensure the proposed development is constructed to the correct BAL-rating specifications.</p>	

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## BAL-12.5 AS3959-2009 - CONSTRUCTION REQUIREMENTS

Note the specification below includes the additional construction requirements Planning for Bushfire Protection Appendix 3 2010. The specification below is a summary from AS3959-2009. Bushfire Planning and Design provides this document as an aid however strongly advises that this document is not a substitute for AS3959-2009. To the best of our knowledge the information below is an accurate representation of AS3959 however Bushfire Planning and Design accepts no liability for any inaccuracy which may have occurred during translation.

Clause	Element	Specification - derived from AS3959-2009
5.1		No gaps greater than 3mm. Any element requiring a screen must have an aperture <2mm and to be corrosion resistant steel or bronze or aluminium.
5.2	Sub Floor Supports - posts, columns, piers, poles	No requirement if enclosed by a compliant wall or mesh screen that complies with 7.4. If unenclosed the sub floor supports, posts columns and piers must be:  - Non combustible <u>or</u> Bushfire-resisting timber (Appendix F) <u>or</u> an AS1530.8.1 tested system
5.3	Elevated floors	No requirement for bearers, joists and flooring if enclosed by a wall or mesh screen that complies with 7.4. Element. If unenclosed and less than 400mm above finished ground, bearers, joists and flooring must be: - Non combustible <u>or</u> Bushfire-resisting timber (appendix F) <u>or</u> an AS1530.8.1 tested system. - Flooring can be non combustible, Appendix F timber as above, particle board or plywood if lined with sarking or mineral wool insulation.
5.4	External Walls	External components of walls less than 400mm from the ground or deck are to comply with the following: 90mm min thick masonry or masonry veneer, stone or, concrete (insitu, aerated) or, mudbrick. Sarking - non combustible or breather membrane flammability index <5. Must be sarked on the outside of the frame. No joints greater than 3mm permitted. Vents and weepholes to be screened with steel, bronze or aluminium  Timber or metal stud clad externally with steel sheet <u>or</u> 6mm FC <u>or</u> bushfire resisting timber (appendix E or F). In all cases sarking is required to the external face of stud.
5.5	External Windows	If a Bushfire shutter is used (metal or bushfire resisting timber - Appendix E or F) then no requirement for window <u>or</u> if a metal screen is used to cover the entire window opening externally then no requirement for the window <u>or</u>  Glazing less than 400mm from the ground or a deck is to comply with the following: Window framing to be metal or bushfire resisting timber or metal reinforced PVC-U.  Glazing to be 4mm Grade A Safety Glass.  Hardware to be metal & seals to have a flammability index <5 or be silicone.  Screen openable portion of window internally or externally.
5.5.3, 5.5.4 , 5.5.5	External Doors	If Bushfire shutter is used (metal or bushfire resisting timber - Appendix E or F) then no requirement for door <u>or</u> Doors to be non combustible or bushfire resisting timber (Appendix E or F) Solid core timber 35mm thick & protected externally with a metal sheet or screen for the first 400mm above the threshold. Fully framed glazed door where frame is non combustible. Screen first 400mm above threshold. Sliding doors - screening not required. All other door types to be screened. Glazing less than 400mm from the ground or a deck is to be 4mm grade A safety glass. Door framing to be metal or bushfire resisting timber or metal reinforced PVC-U/. Draught excluders must be installed at the base of the door. Refer to the standard for garage doors.
5.6	Roofs	Non combustible including penetrations. Tiled roof to be sarked - battens allowed above sarking. Overhead glazing to be Grade A safety glass AS1288. Verandah, carport and awning roofs connected to main building must meet all criteria of the main roof. Gables to comply with 6.6 Fascia, eaves and bargeboard linings not addressed in BAL-19. Plastic or timber storm moulds can be used. Downpipes no requirement. Gutters to be metal or PVCu. Box gutters to be non combustible. No requirement for leaf guards but if installed must be non combustible.
5.7	Verandahs & Decks	No requirement for framing and supports if enclosed with a compliant screen or a wall that complies with 5.4 Decking to be spaced. Decking, treads and ramps to be non combustible or bushfire resisting timber (Appendix F)  Supports and framing to be non combustible or an AS1530.8.1 tested system or a bushfire resisting timber (Appendix F).  Balustrades and handrails within 125mm of the building to be non combustible - no requirement if greater than 125mm.
5.8	Water & Gas	Above ground water and gas pipes to be metal.



## SECTION 4. ASSET PROTECTION ZONE (APZ) REQUIREMENTS

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.

- A defensible space is to be provided within the boundary of the site.
- An asset protection zone is provided and maintained for the life of the development.

The asset protection zones (APZ) requirements have been derived from the methodology of Appendix 2 of Planning for Bushfire Protection 2006. Asset protection zones and in particular the Inner Asset Protection Zones are critical for providing defensible space and reducing flame length and rate of spread (PBP 2006). APZs are designed to provide sufficient open space for emergency workers to operate and for occupants to egress the site safely. They are divided into Inner and Outer Asset Protection Zones (IPAs and OPAs) and are required to be maintained for the life of the development. The IPA provides for defensible space and a reduction of radiant heat levels at the building line and the OPA provides for the reduction of the rate of spread and filtering of embers. The required Asset Protection Zones are identified in table 5 below.

TABLE 5.0		
	EAST <sup>1</sup>	ALL DIRECTIONS
<b>REQUIRED APZ<sup>3</sup></b>	48m (Forest U-S <sup>2</sup> )	Not Applicable (Managed Land)
<b>ACHIEVED APZ<sup>2</sup></b>	> 65m Manage as IPA	Manage as IPA

<sup>1</sup> Cardinal direction from each proposed building facade based on magnetic north.

<sup>2</sup> Site slope is calculated from 1m LIDAR contours.

<sup>3</sup> Minimum APZ required stated as Acceptable Solutions within Table A2.4 PBP (2006). In the case where a rating lower than BAL-29 is proposed the APZ will reflect the distance specified in AS3959 (2009) that is required to achieve the nominated BAL-rating.

<sup>4</sup> Actual dimensional setback from face of building to assessed vegetation.

There is insufficient space within the site to provide an asset protection zone (APZ). A 48m APZ is required (and achieved) between the proposed building and the forest to the east. A minimum 65m APZ is provided which is sufficient to achieve the nominated BAL-ratings and defensible space. The nominated APZs are to be managed for perpetuity.

Refer to Section 8 for Asset Protection Zone and Landscaping guidelines.

ADDITIONAL COMMENTS IN RELATION TO ASSET PROTECTION ZONES	ACCEPTABLE SOLUTION
The proposed development can comply with PBP (2006).	

SECTION 5. ACCESS REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupants faced with evacuation.

Safe, operational access is to be provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire, (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7 as defined in Planning for Bushfire Protection (2006).

PUBLIC ROADS - SPECIFIC REQUIREMENTS

Barrenjoey Road is sealed public through road. The public road system is deemed to be adequate for emergency services appliances. Figure D shows the road systems in the area.

PROPERTY ACCESS - SPECIFIC REQUIREMENTS

In the event of a bushfire, emergency response workers will operate from the public road system. Planning for Bushfire Protection (2006) page 22 states;

*“A distinction is drawn between rural private access roads and those in urban areas..... By comparison, urban areas have an existing infrastructure and requirements are generally less of a problem. In addition, it is acknowledged that fire appliances will generally operate from the public road system”.* Refer to the guidelines from NSW fire and Rescue (Figure C below).

ADDITIONAL COMMENTS IN RELATION TO ACCESS	ACCEPTABLE SOLUTION
The proposed development can comply with the intent of PBP (2006) with regards to site access (and water) requirements.	

7.1.4 If the minor residential development will have a private carriageway providing fire appliance access as per section 6, the distance from a fire appliance on the carriageway to the nearest street fire hydrant should not exceed 60m (see Figure 6).

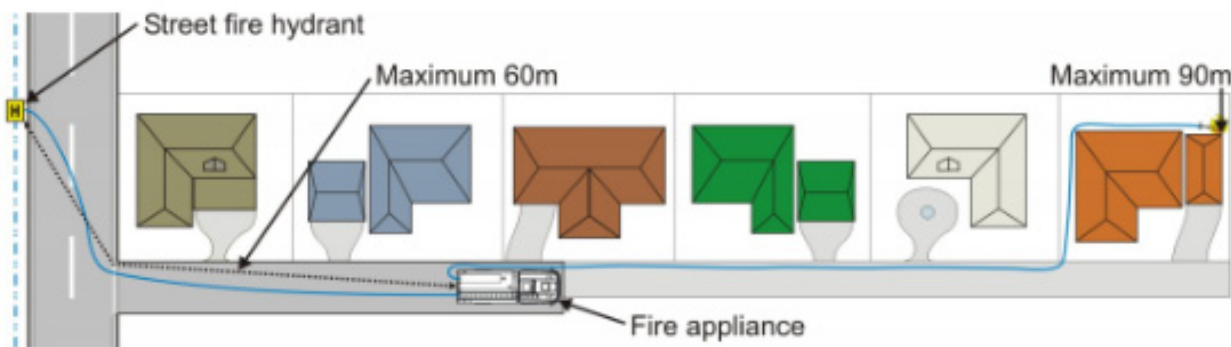


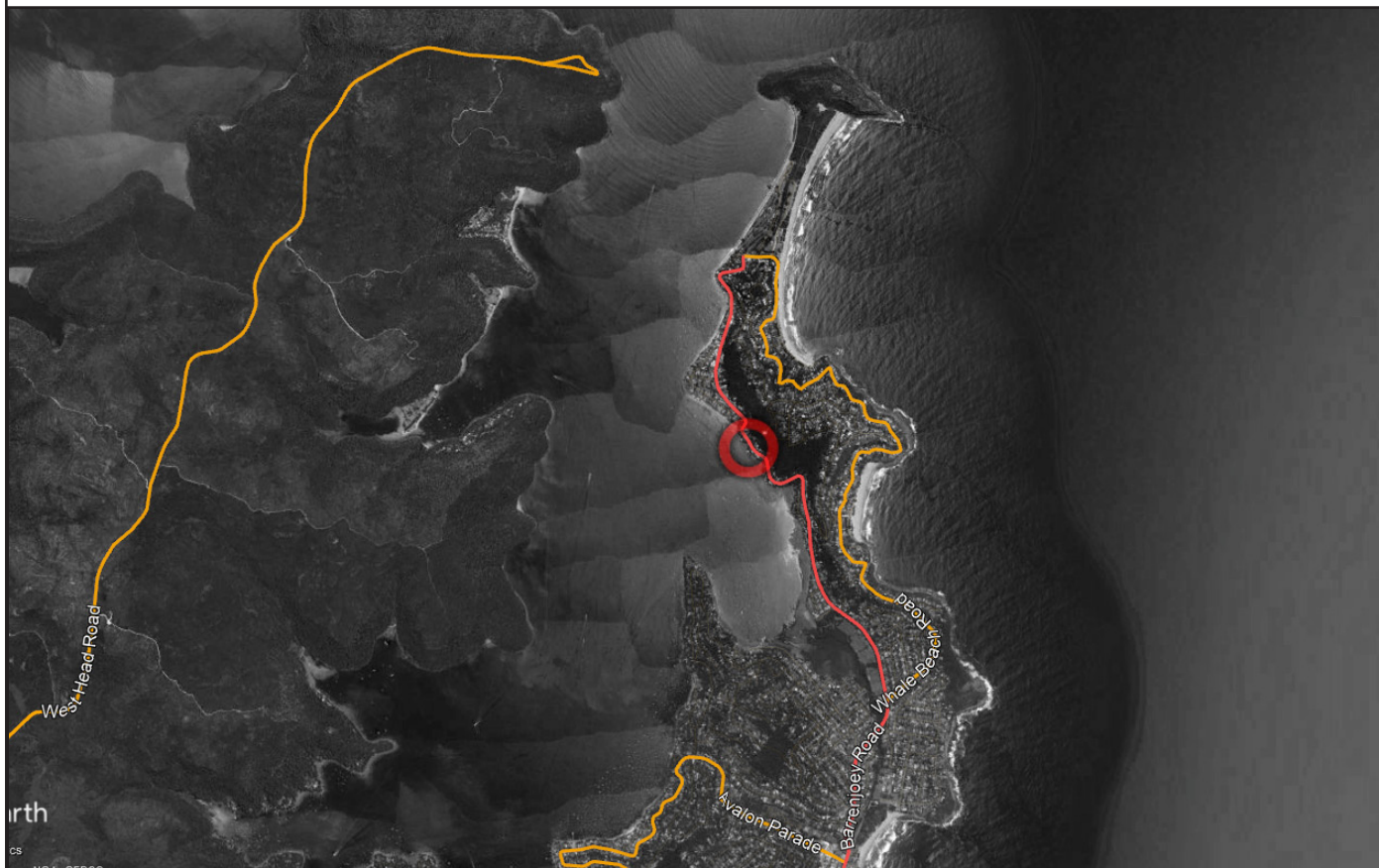
Figure C: Extract from NSW Fire and Rescue requirements (2016) “Fire Requirements for Minor Residential Development” - the subject site has a fire hydrant within 60m of the boundary. Therefore suitable water provisions are provided for fire fighting (with regard to proximity and access).

## Figure D - ACCESS PROVISIONS

Date of Issue 12/01/2020



Aerial image modified from [www.google.com/maps](http://www.google.com/maps)



Arterial Road



Minor Road



Other Road



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## SECTION 6. SERVICES REQUIREMENTS - WATER

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building

- Adequate water and electricity services are to be provided for fire fighting operations.

### WATER - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2006) with regards to water requirements. Reticulated water is provided however the hydrant sizing, spacing or pressures have not been tested. No additional water for the suppression of bushfire is required for the proposed development. The following points are to be adhered to for the life of the development.

- All above ground water and gas service pipes and fittings external to the building are metal.

### ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF WATER

### ACCEPTABLE SOLUTION

The proposed development can comply with PBP (2006).

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## SECTION 7. SERVICES REQUIREMENTS - ELECTRICITY & GAS

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building

- Gas and electricity services are to be located so as not to contribute to the risk of fire to a building.

### ELECTRICITY AND GAS - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2006) with regards to electricity and gas requirements. The following points are to be adhered to (where applicable) for the provision of electricity and gas services where applicable.

#### ELECTRICITY REQUIREMENTS

- Where practicable place electrical transmission lines are underground or,
- If 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).

#### GAS REQUIREMENTS

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

#### ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF ELECTRICITY AND GAS.

#### ACCEPTABLE SOLUTION

The proposed development can comply with PBP (2006) with regard to the provision of gas and electricity.

## SECTION 8. LANDSCAPING AND PROPERTY MAINTENANCE

### GENERAL REQUIREMENTS (PBP 2006)

It is expected that the nominated APZs will be maintained by the owner of the land as part of the development. It is accepted practice that after construction of a dwelling, gardens will be established and landscaping of the grounds will be undertaken. The following principles should be applied for the establishment of gardens and property maintenance.

### MAINTENANCE

Prior to the bushfire season which runs from October to March the site should be maintained utilising the following guidelines.

- Remove organic material from the roof and gutters and valleys.
- Check roof tiles (if applicable) for damage or dislodged roofing materials.
- Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps.
- Hinged doors are fitted with draught seals and well maintained.
- Combustible floor mats should not be used.
- Screens on windows and doors are in good condition without breaks or holes in fly screen material and frames are well fitting into sills and window frames.
- Where applicable, check that pumps and water supplies are available and in working order.
- Where applicable, drenching or spray systems are tested before the fire season.
- Hoses and hose reels are not perished and fittings are tight and in good order.
- Woodpiles, garden sheds and other combustible materials are located away from the house.

### INNER APZ (IPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2018).

The Inner APZ (IPA) is the managed area closest to the asset (eg. dwelling). The IPA is managed to minimal fuel conditions and aims to mitigate the impact of direct flame contact and radiant heat on the development. The IPA also aims to provide defensible space.

### TREES

- Canopy cover should be less than 15% (at maturity)
- Trees (at maturity) should not touch or overhang the building
- Lower limbs should be removed up to a height of 2m above ground
- Canopies should be separated by 2 to 5m
- Preference should be given to smooth barked and evergreen trees.

**SHRUBS**

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings.
- Shrubs should not be located under trees shrubs should not form more than 10% ground cover.
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

**GRASS**

- Should be kept mown (as a guide grass should be kept to no more than 100mm in height).
- Leaves and vegetation debris should be removed.

**OUTER APZ (OPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2018).**

The Outer APZ (OPA) is the part of the APZ that is located between the IPA and the bushfire vegetation threat.

The reduction in the available fuels and canopy connections in the OPA aims to mitigate the intensity of an approaching fire and restricts the pathways to crown fuels thus reducing the level of direct flame, radiant heat and ember attack on the IPA and asset (dwelling).

**TREES**

- Canopy cover should be less than 30% (at maturity)
- Trees should have canopy separation canopies should be separated by 2 to 5m.

**SHRUBS**

- Shrubs should not form a continuous canopy.
- Shrubs should form no more than 20% of ground cover.

**SECTION 9. DEVELOPMENT RECOMMENDATIONS**

The following points are recommended for inclusion in the DA conditions of consent;

1. Construct the development to the nominated BAL-Ratings (Section 2 and 3).
2. Create and or manage the nominated APZs for perpetuity (Section 4).
3. Establish gardens and landscaping as per the guidelines in Section 8.
4. Comply with the access provisions as discussed in Section 5 (If applicable).
5. Comply with the provision of water, electricity and gas as discussed in Section 6 & 7 (If applicable).
6. Maintain the property as discussed in Section 8.
7. In the event that Council or the NSW Rural Fire Service modifies our recommendations then this report should no longer be referred to. The bushfire requirements as stated in the DA Consent conditions will take precedence.
8. We strongly recommend that the applicant cross references the bushfire requirements within the DA consent conditions and our report and alert us to any discrepancies.

## SECTION 10. CONCLUSION

The development relates to the undertaking of alterations and additions to the existing dwelling.

The development is captured under Section 4.14 of the Environmental Planning and Assessment Act 1979; Consultation and development consent – certain bush fire prone land. For the purpose of bushfire assessment the development is considered infill development as described in the New South Wales Rural Fire Service document Planning for Bushfire Protection (2006).

The subject site is located in a residential area in Palm Beach which is under the jurisdiction of the Northern Beaches Council. Access to the site is from Barrenjoey Road to the east. An existing dwelling is located on the site. The allotment is surrounded by managed residential curtilage to the north and south. Pittwater Estuary is located to the west. Forest vegetation is located steeply up-slope more than 65m to the east. A thin remnant parcel of vegetation is located on the cliff to the east of Barrenjoey Road.

There is insufficient space within the site to provide an asset protection zone (APZ). A 48m APZ is required (and achieved) between the proposed building and the forest to the east. A minimum 65m APZ is provided which is sufficient to achieve the nominated BAL-ratings and defensible space. The nominated APZs are to be managed for perpetuity.

The proposed dwelling is assessed as BAL-12.5 as indicated in figure C and as specified in AS3959 (2009), the Australian Standard for the Construction of Buildings in a Bushfire Prone Area. The general requirements of Section 3 in AS3959 (2009) and the additional construction requirements of Planning for Bushfire Protection Appendix 3 (2010) also apply.

The project can comply with the construction requirements of AS3959 (2009) and the performance requirements of the BCA. The objectives and performance requirements of PBP (2006) are also achieved.

Site access, including access via the public road system is suitable for emergency response vehicles. The development complies with PBP (2006) with regards to the provision of water. The requirements for electricity and gas can also be complied with.

Should Council or the NSW Rural Fire Service have any objection to any part of this report, please provide the professional courtesy to get in contact to discuss.

Regards,



Matthew Noone

Grad.Dip. Design for Bushfire Prone Areas.

BSc (Geology)

0406077222





## SECTION 11. REFERENCES

- AS3959 (2009) Australian Standard, Construction of buildings in bushfire-prone areas, AS 3959, Third edition 2009, Standards Australia International Ltd, Sydney.
- BCA (2019) Building Code of Australia 2019, Building Code of Australia, Australian Building Codes Board, Canberra 2019.
- EPA Act (1979) Environmental Planning and Assessment Act 1979, NSW Government, NSW, legislation found at [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)
- PBP (2006) Planning for Bushfire Protection, a Guide for Councils,Planners, Fire Authorities, Developers and Home Owners. Rural Fire Service 2006, Australian Government Publishing Service, Canberra.

## SECTION 12. APPENDICES

Appendix A - Standards for Asset Protection.

Appendix B - Architectural Drawings.

Appendix C - Photos.

# **APPENDIX A - STANDARDS FOR ASSET PROTECTION**

## **RFS STANDARDS FOR ASSET PROTECTION**

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

### **RAKING OR MANUAL REMOVAL OF FINE FUELS**

- Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of fire.
- Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

### **MOWING OR GRAZING OF GRASS**

- Grass needs to be kept short and, where possible, green.

### **REMOVAL OR PRUNING OF TREES, SHRUBS AND UNDERSTOREY**

- The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.
- Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.
- Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

### **WHEN CHOOSING PLANTS FOR REMOVAL, THE FOLLOWING BASIC RULES SHOULD BE FOLLOWED**

- Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or ‘undesirable species’. Alternatively, a list of noxious weeds can be obtained at [www.agric.nsw.gov.au/noxweed/](http://www.agric.nsw.gov.au/noxweed/);
- Remove more flammable species such as those with rough, flaky or stringy bark; and
- Remove or thin understorey plants, trees and shrubs less than three metres in height
- The removal of significant native species should be avoided.

## GARDEN DESIGN

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

### LAYOUT OF GARDENS IN AN APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.

### LAYOUT OF GARDENS IN AN APZ

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

- Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

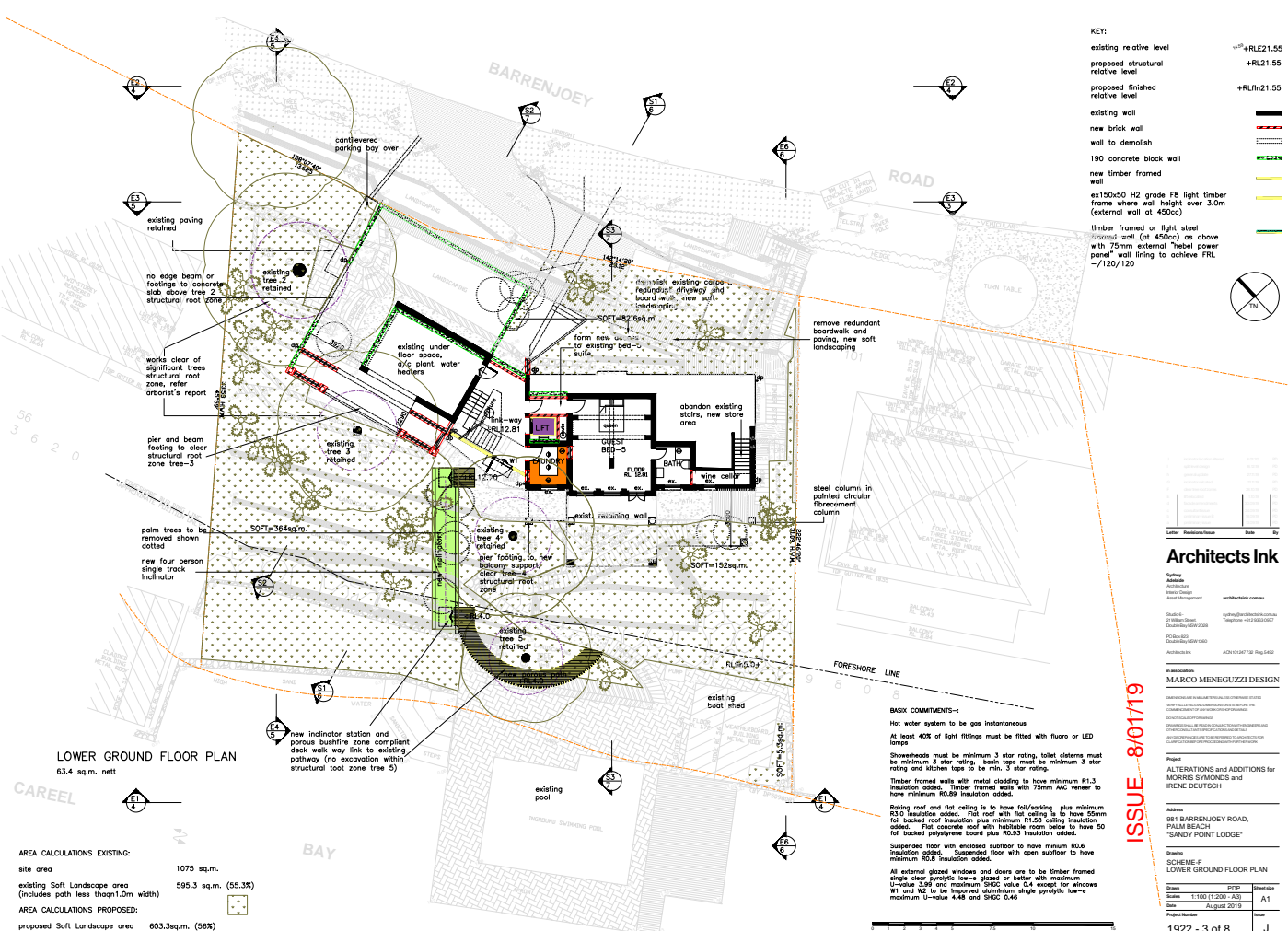
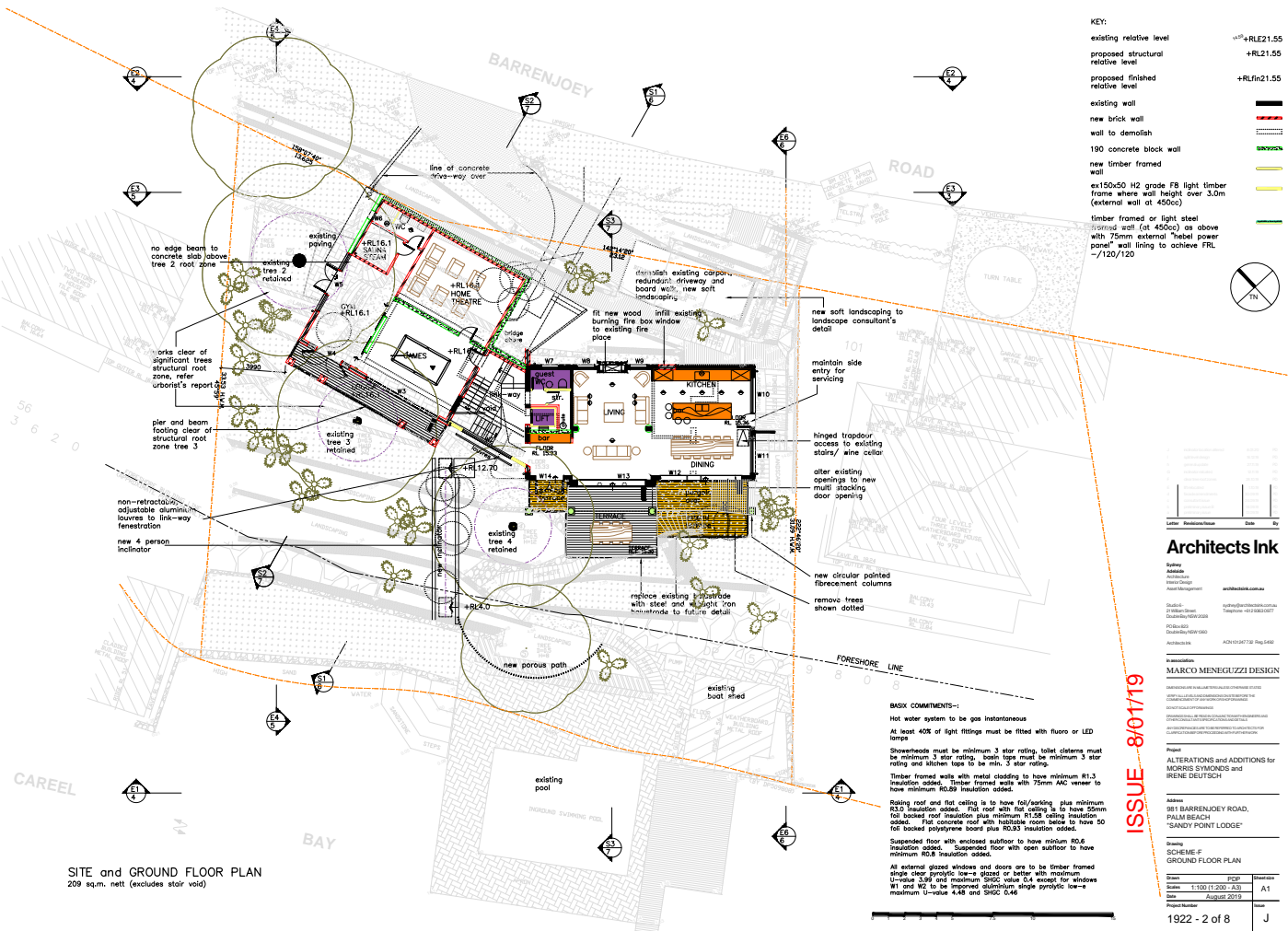
Plants that are less flammable, have the following features:

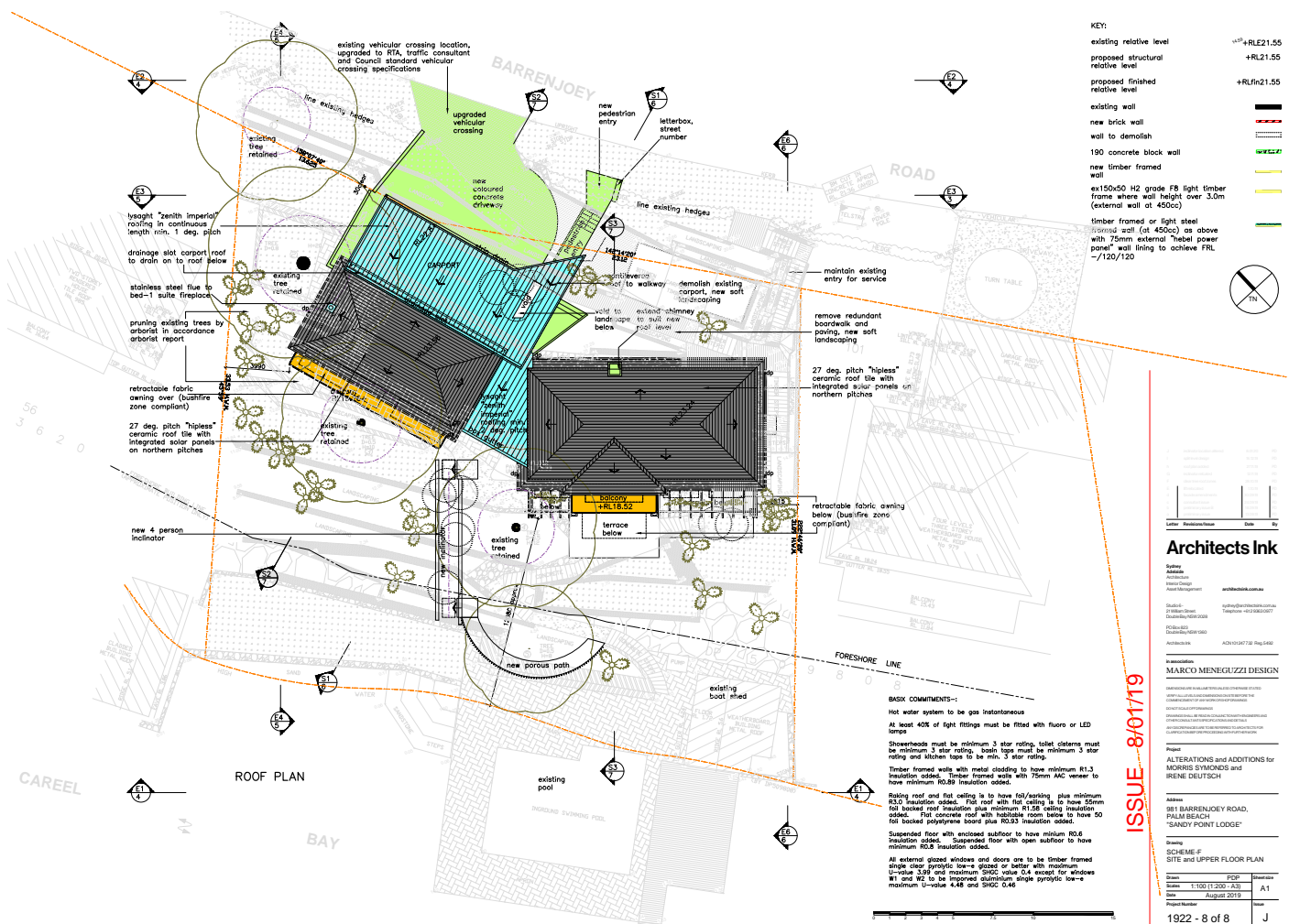
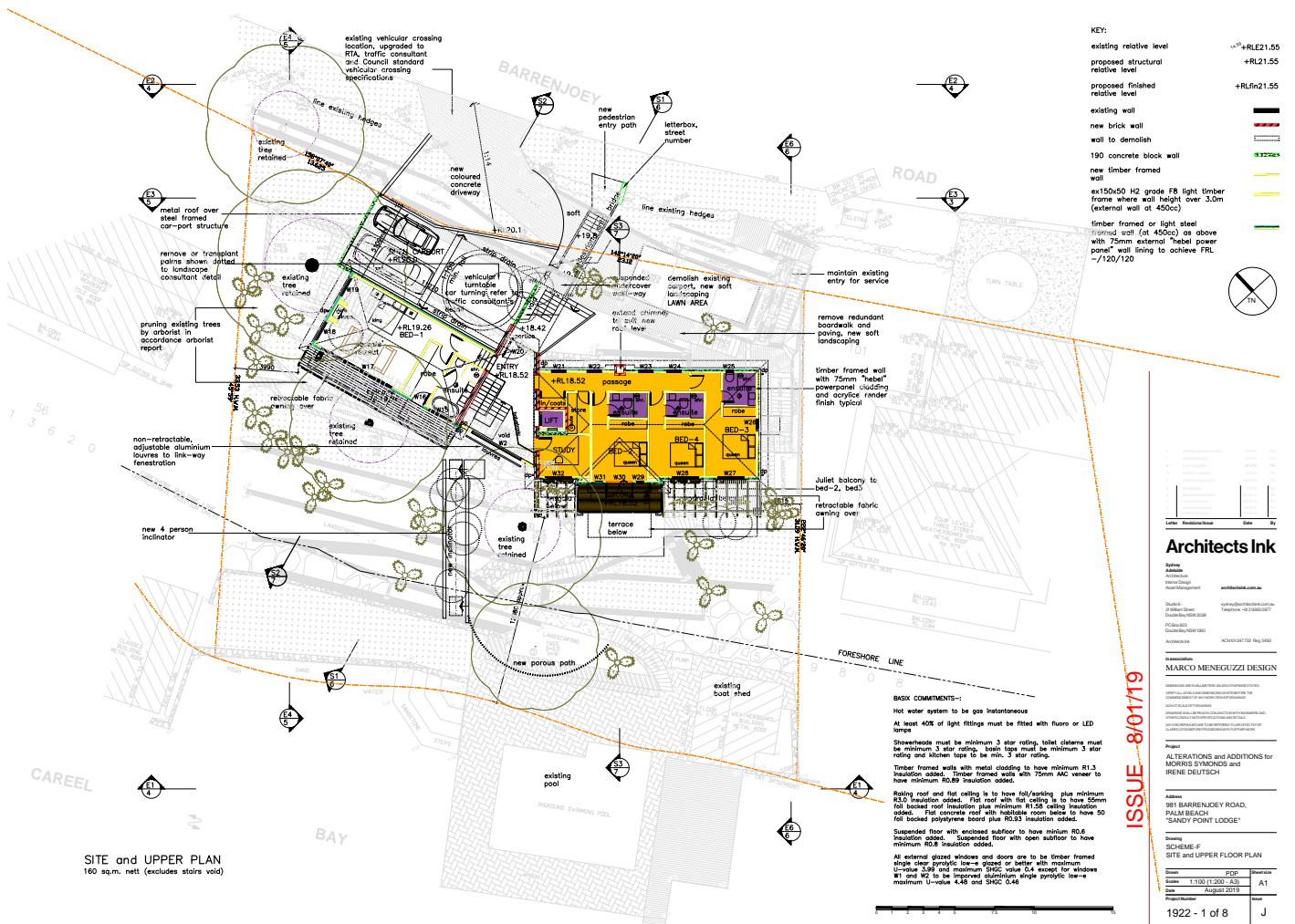
- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without “ribbons” hanging from branches or trunks; and
- dense crown and elevated branches.



# **APPENDIX B -**

## **ARCHITECTURAL DRAWINGS**











# APPENDIX C - PHOTOS / IMAGES





1: View looking north along Barrenjoey Road. Hydrant within close proximity to boundary.



2: Remnant vegetation to the east of Barrenjoey Road.





3: Remnant vegetation to the east of Barrenjoey Road. Managed land behind this then forest vegetation further to the east.