

Bushfire Assessment Report

Proposed:
**Sole Occupancy
Dwelling**

At:
**41 Coasters Retreat,
Coasters Retreat**

Reference Number: 201569

Prepared For:
Karmitecture

7th May 2021

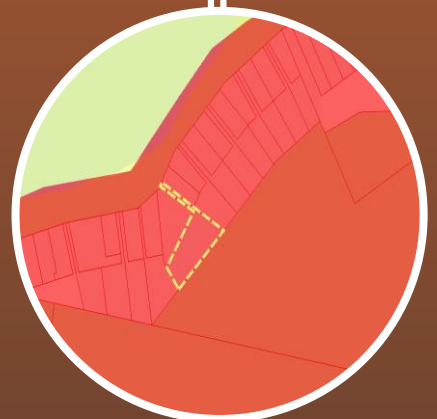
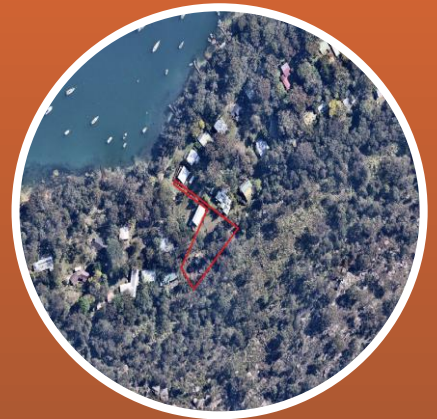


Prepared By:
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Contents

	<u>Page No.</u>
Copyright and Disclaimer	2
List of Abbreviations	3
1.0 Introduction	4
2.0 Purpose of Report	5
3.0 Scope of Report	5
4.0 Compliance Table and Notes	5 - 6
5.0 Aerial view of the subject allotment	7
6.0 Site Assessment	8 - 10
7.0 Bushfire Protection Measures	11 - 14
8.0 Recommendations	15 - 16
9.0 Conclusion	17
10.0 Annexure	18
- List of referenced documents and attachments	
- Attachments	

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S4.14 applications (under the Environmental Planning and Assessment Act 1979) and all infill development applications may be referred by Council to the NSW Rural Fire Service for review and concurrence during the DA process. S100B applications under the Rural Fires Act 1997 (subdivisions and Special Fire Protection Purpose Developments), Flame Zone determinations and Alternate Solutions must be referred by Council to the NSW Rural Fire Service for review and receipt of a Bushfire Safety Authority (BSA) or other such recommended conditions from the NSW Rural Fire Service before the consent can be granted.

The onus is on the applicant to cross reference this document with any conditions of consent issued by Council or any requirements supplied by the NSW Rural Fire Service following development approval. BCBHS can review and cross reference these documents however the onus is on the applicant to provide them to us and request this review – Building Code and Bushfire Hazard Solutions Pty. Ltd. is not in a position to track every DA through Council and we rely upon the applicant to undertake this role as project co-ordinator.

Where any discrepancy between this document and the development approval or the NSW Rural Fire Service requirements is found, the conditions of consent always take precedence until such time as an application to review, amend or vary these conditions is approved.

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Version Control				
Version	Date	Prepared by	Prepared by	Details
1	09/11/2020	Andrew Muirhead	Stuart McMonnies BPAD Accreditation No. 9400	Final Report
2	07/05/2021	Andrew Muirhead		Plan Update

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018 as amended
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
NCC	National Construction code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection - 2019
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SFR	Short Fire Run
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to a construction of a new sole occupancy dwelling within an existing residential allotment located at 41 Coasters Retreat, Coasters Retreat.

The subject property abuts private allotments to the north, southwest and west and Ku-ring-gai Chase National Park to the southeast.

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bush Fire Protection - 2019' (PBP).

PBP formally adopted on the 1st March 2020 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing designated Category 1 Vegetation, therefore the application of PBP must apply in this instance.

The subject development relates to construction of a sole occupancy dwelling within an existing residential allotment. The development is classified as infill development and assessed as a s4.14 application under the Environmental Planning and Assessment Act 1979 and Chapter 7 of PBP applied.

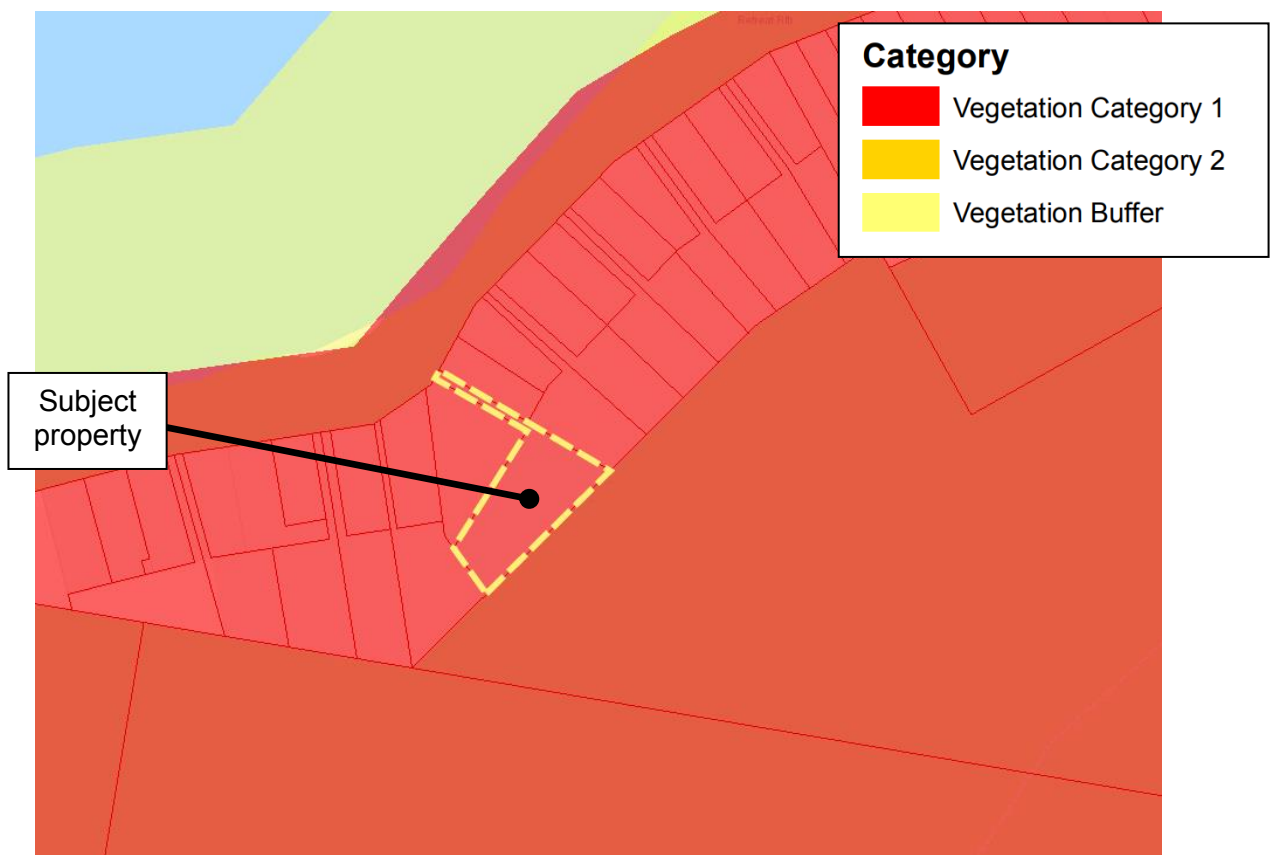


Figure 01: Extract from Northern Beaches Council's Bushfire Prone Land Map

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide the owners, the Rural Fire Service and Council with an independent bushfire hazard determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific 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*.

	Transect 1*
Vegetation Structure	Forest
Effective Slope	10 degrees up
Asset Protection Zone	>12 metres
Significant Landscape Features	Ku-ring-gai National Park
Threatened Species	APZ Existing
Aboriginal Relics	APZ Existing
Radiant Heat Flux	35.28 kW/m ²
Bushfire Attack Level	BAL 40**
Required Construction Level	BAL 40

* Refer to Figure 02 (p7) for a depiction of the transect.

** The Bushfire Attack Level was determined from bushfire design modelling.

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 available Asset Protection Zone was measured to be 12 metres to the southeast and consists of maintained grounds within the subject property.

Construction Level

The highest Bushfire Attack Level to the proposed works was determined from bushfire design modelling (report attached) consistent with Method 2 of AS3959 – 2018 to be 'BAL 40'. The proposed works are required to comply with sections 3 and 8 (BAL 40) of AS 3959 – 2018 and the additional construction requirements under section 7.5 of PBP 2019. The northwest elevation is downgraded to BAL 29 due to shielding by the dwelling itself.

Access and Services

Guideline Ref.	Proposed Development Determinations
Property Access	The subject site is accessed via Coasters Retreat to the northwest and has full pedestrian access all around the proposed building.
Water Supply	The most distant external point of the building footprint is >70 metres from Coasters Retreat and therefore a 10,000 Litre Static Water Supply is required.
Evacuation	Evacuation is possible by utilising existing road infrastructure. It is recommended that the occupants complete a Bush Fire Survival Plan addressing "Prepare, Act Survive" as advocated by the NSW RFS http://www.rfs.nsw.gov.au/ under publications / bushfire safety.
Electrical Supply	Existing supply provided.

5.0 Aerial view of the subject allotment

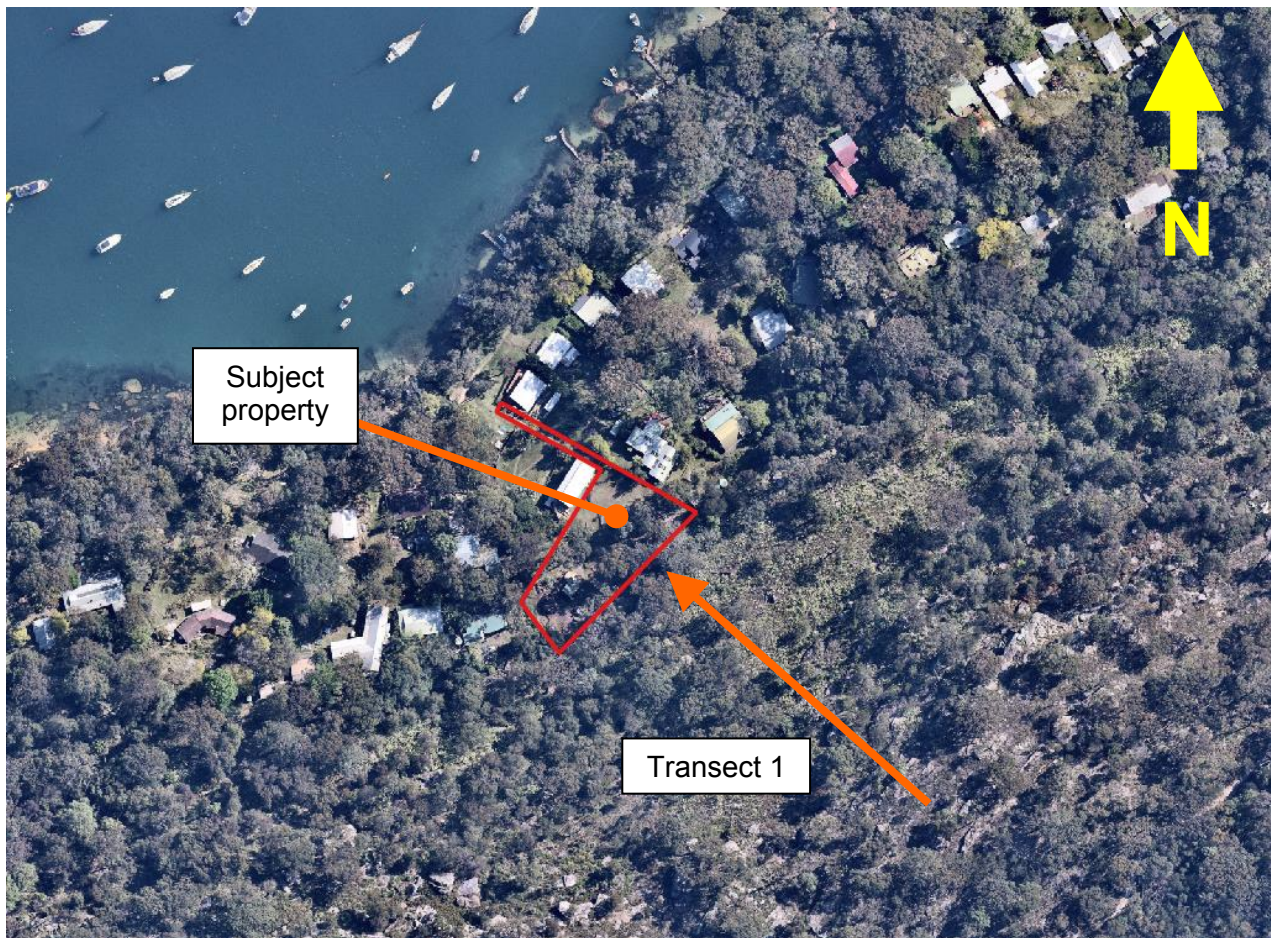


Figure 02: Aerial view of the subject area C/- Nearmap

6.0 Site Assessment

6.01 Location

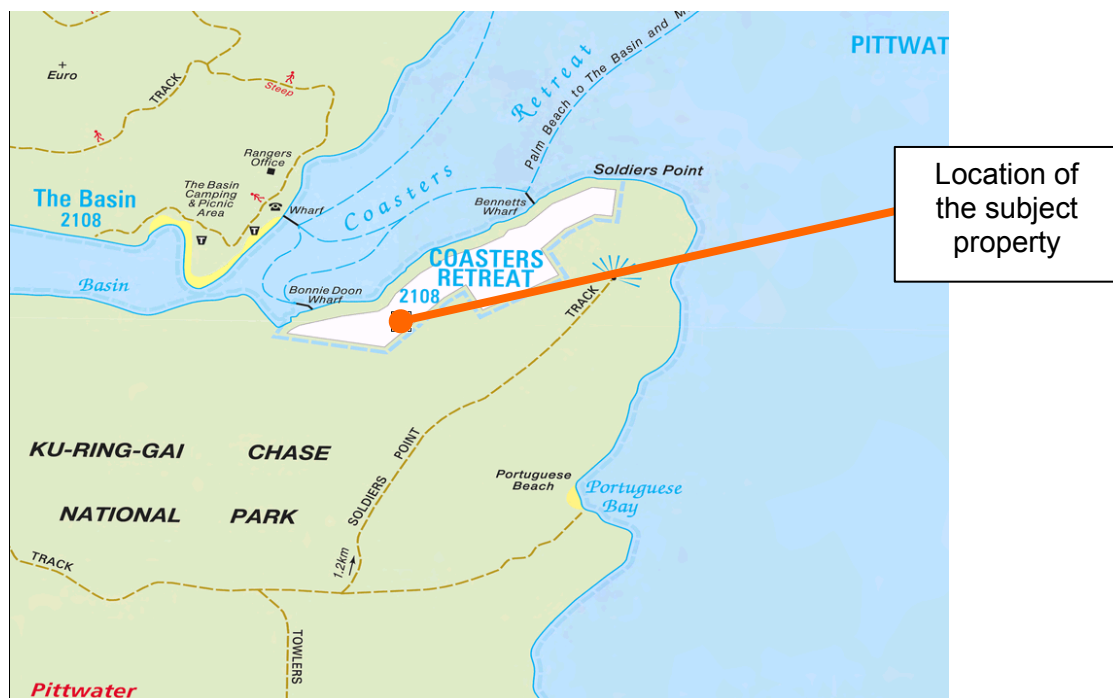
The subject property is known as 41 Coasters Retreat, Coasters Retreat (Lot 5 DP 25653) and is a residential allotment located within Northern Beaches Councils Local Government Area. The subject property abuts private allotments to the north, southwest and west and Ku-ring-gai Chase National Park to the southeast.

The vegetation identified as being the hazard is within Ku-ring-gai National Park to the southeast.



Pedestrian
Access

Photograph 01: View southeast towards the subject property



Location of
the subject
property

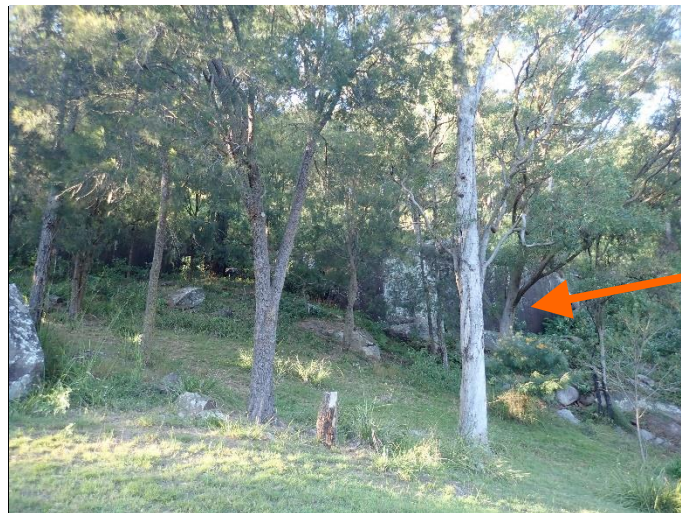
Figure 03: Extract from street-directory.com.au

6.02 Vegetation

The predominant vegetation within the subject property and neighbouring private residential allotments was found to consist of landscaped gardens and mown lawns.

The vegetation identified as being the hazard is within Ku-ring-gai National Park to the southeast. The vegetation posing a bushfire hazard was found to consist of trees 10 – 20 metres in height with a 30 - 70% foliage cover and an understorey of small trees and shrubs.

For the purpose of assessment under Planning for Bush Fire Protection the vegetation posing a hazard to the southeast of the subject dwelling has been determined to be Forest. It should also be noted that the ground fuels within the hazard were heavily broken by large rock outcrops, which limit the amount of available fuels, which will subsequently reduce the intensity and rate of spread of any bushfire impacting the subject dwelling from that modelled. It is noted that vegetation mapping has determined the vegetation type to be Northern Hinterlands WSF, which has been used for the bushfire design modelling.



Forest

Photograph 02: View from subject property towards Ku-ring-gai National Park



Forest

Photograph 03: View from subject property towards Ku-ring-gai National Park

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 hazard. The most significant bushfire impact to the subject dwelling is expected to be a bushfire travelling down slope towards the subject property.

The gradient within the hazard was recorded to be greater than 15 degrees however as an additional margin of safety we have capped the gradient at 10 degrees for the bushfire design modelling.

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

- 28 degrees up slope within transect 1

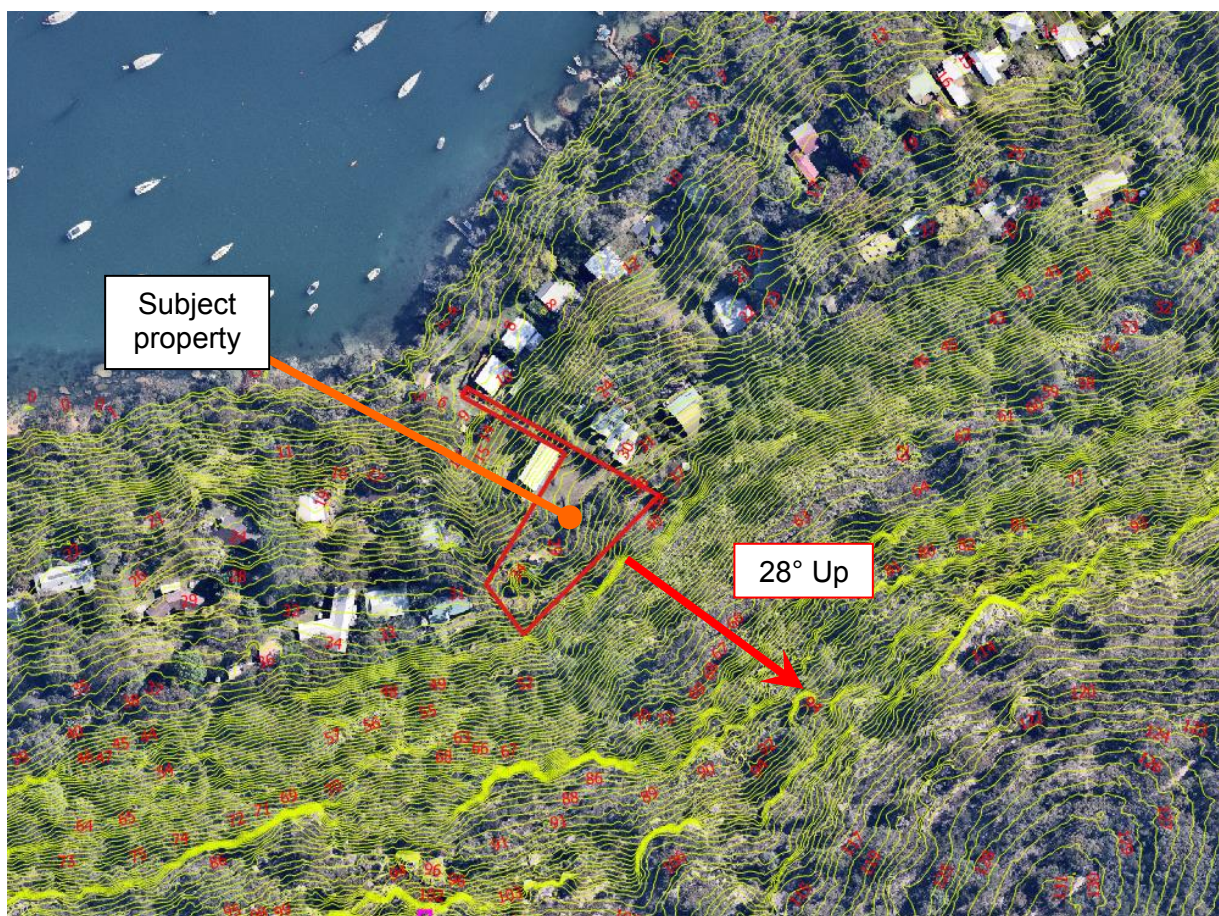


Figure 04: Aerial view of the subject property courtesy Elevation Foundation Spatial Data – Geoscience Australia

7.0 Bushfire Protection Measures

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 or 3 Vegetation.

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing designated Category 1 Vegetation, therefore the application of PBP must apply in this instance.

The application of Planning for Bush Fire Protection requires satisfactory demonstration of the aim and objectives and the following bushfire protection measures (BPMs):

- Asset Protection Zones
- Building construction, siting & design
- Access arrangements
- Water supply & utilities
- Emergency management arrangements
- Landscaping

As the proposal relates to the construction of a sole occupancy dwelling the proposal must comply with the bushfire protection measures detailed within Chapter 7 'Residential Infill Development' of PBP.

7.02 Asset Protection Zones

The subject property is a residential allotment located in an area of similar properties. The vegetation identified as being the hazard is within Ku-ring-gai National Park to the southeast.

The available Asset Protection Zone (APZ) was measured onsite and verified from aerial photography and plans provided to be >12 metres to the southeast. The existing APZ was found to consist of maintained grounds within the subject property.

Recommendations on maintenance of the APZs within the subject property will be included within the recommendations of this report.

7.03 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.

Correlation between bushfire impact and AS3959		
Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2018
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

The highest Bushfire Attack Level to the proposed works was determined from bushfire design modelling (report attached) consistent with Method 2 of AS3959 – 2018 to be 'BAL 40'. The proposed works are required to comply with sections 3 and 8 (BAL 40) of AS 3959 – 2018 and the additional construction requirements under section 7.5 of PBP 2019. The northwest elevation is downgraded to BAL 29 due to shielding by the dwelling itself.

7.04 Property Access

The subject property has pedestrian access to the water frontage of Coasters Retreat to the west. Persons seeking to egress from the subject dwelling can do so freely from the existing public pontoons.

Fire services have free access around the building footprint. Attending fire crews can access the hazard directly via the subject property, neighbouring private allotments or the Fire Trail within Kuring-gai National Park for hazard reduction or fire suppression activities.

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

7.05 Water Supply

The most distant external point of the building footprint is within >70 metres of the Coasters Retreat and therefore a 10,000 Litre Static Water Supply for fire fighting purposes is required as per section 7.4 of PBP.

The recommended water supply is considered suitable for the replenishment of fire service vessels.

7.06 Emergency management arrangements

Evacuation is possible by utilising existing road infrastructure.

It is encouraged that the occupants complete a Bush Fire Survival Plan. The template for this plan is available at <https://www.rfs.nsw.gov.au/resources/bush-fire-survival-plan>.

7.07 Landscaping

Any new landscaping must comply with Section 3.7 'Landscaping' of *Planning for Bush Fire Protection* 2019.

7.08 Aim & Objectives of PBP

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

Aim / Objective	Comment
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.	With the inclusion of the recommendations made herein it is of our opinion that the aim of PBP has been satisfied.
(i) afford buildings and their occupants protection from exposure to a bush fire;	The proposed works will be constructed to BAL 40 being the relevant Bushfire Attack Level.
(ii) provide for a defensible space to be located around buildings;	The proposed works has an APZ of 12 metres to the southeastern hazard, providing a reasonable defensible space.
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;	The proposed works has an APZ of 12 metres to the southeastern hazard, which in conjunction with the application of BAL 40 will prevent the likely fire spread to the building.

Aim / Objective	Comment
(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;	The most distant external point of the proposed footprint is greater than 70 metres from a public road supporting the operational use of fire fighting vehicles.
(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and	<p>All grounds within the subject site will be maintained in accordance with an Asset Protection Zone / Inner Protection Area as detailed in Appendix 4 of Planning for Bush Fire Protection 2019 and the NSW Rural Fire Service publication 'Standards for Asset Protection Zones'.</p> <p>Any new landscaping is to comply with the provisions of Table 7.4a and Appendix 4 of PBP – 2019.</p>
(vi) ensure that utility services are adequate to meet the needs of firefighters.	The most distant external point of the building footprint is >70 metres of the Coasters Retreat and therefore a 10,000L Static Water Supply for fire fighting purposes is necessary.

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 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas - 2018. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

Asset Protection Zones

1. That all grounds within the subject property shall be maintained as an Asset Protection Zone as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Section 3.7 of Planning for Bush Fire Protection 2019.

Construction

2. That all roofing and construction facing northeast, southeast and southwest shall comply with sections 3 and 8 (BAL 40) Australian Standard AS3959-2018 'Construction of buildings in bush fire-prone areas' and section 7.5 of Planning for Bush Fire Protection 2019.
3. That construction facing northwest shall comply with sections 3 and 7 (BAL 29) Australian Standard AS3959-2018 'Construction of buildings in bush fire-prone areas' and section 7.5 of Planning for Bush Fire Protection 2019.

Landscaping

4. That any new landscaping is to comply with section 3.7 and Appendix 4 under Planning for Bush Fire Protection 2019. This will allow for gardens (including native trees and shrubs) in the APZ managed as clumps or islands, covering no more than 20% of the area.

Landscaping shall comply with the following:

- Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways.
- Grassed areas/mowed lawns/ or ground cover plantings being provided in close proximity to the building.
- Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come in contact with the building.
- maintaining a clear area of low cut lawn or pavement adjacent to the house;
- keeping areas under fences, fence posts and gates and trees raked and cleared of fuel;
- utilising non-combustible fencing and retaining walls• breaking up the canopy of trees and shrubs with defined garden beds;
- organic mulch should not be used in bush fire prone areas and non-flammable material should be used as ground cover, eg. Scoria, pebbles, recycled crushed bricks.
- planting trees and shrubs such that:
- the branches will not overhang the roof;
- the tree canopy is not continuous

Emergency management

5. That the occupants of the subject dwelling complete a Bush Fire Survival Plan.

Water

6. That a 10,000 litre static water supply be provided within the subject property, where this supply is a water tank it shall comply with the following;
 - a suitable connection for firefighting purposes is made available and located within the IPA and away from the structure. A 65mm Storz outlet with a gate or Ball valve is provided.
 - ball valve and pipes are adequate for water flow and are metal.
 - supply pipes from tank to ball valve have the same bore size to ensure flow volume,
 - underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank,
 - a hardened ground surface for truck access is supplied within 4m of the access hole,
 - above-ground tanks are manufactured from concrete or metal,
 - raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F AS 3959),
 - unobstructed access can be provided at all times,
 - tanks on the hazard side of a building are provided with adequate shielding for the protection of
 - firefighters,
 - underground tanks are clearly marked,
 - all exposed water pipes external to the building are metal, including any fittings,
7. A minimum 5hp or 3kW petrol or diesel powered pump and hoses and nozzles for first attack fire-fighting shall be made available to the water supply.

9.0 Conclusion

Given that the property is deemed bushfire prone under Northern Beaches Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2019 and of the construction requirements of AS3959 – 2018. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The development proposal relates to the construction of a sole occupancy dwelling within an existing residential allotment.

The vegetation identified as being the hazard is within Ku-ring-gai National Park to the southeast. The vegetation posing a hazard was determined to be Forest.

The proposed works were found to provide a >12 metre Asset Protection Zone (APZ) to the southeast. The existing APZ was found to consist of maintained grounds within the subject property.

The highest Bushfire Attack Level to the proposed works was determined from bushfire design modelling (report attached) consistent with Method 2 of AS3959 – 2018 to be 'BAL 40'. The proposed works are required to comply with sections 3 and 8 (BAL 40) of AS 3959 – 2018 and the additional construction requirements under section 7.5 of PBP 2019. The northwest elevation is downgraded to BAL 29 due to shielding by the dwelling itself.

The required water supply and existing access provisions are considered adequate in this instance.

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 development application.

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

Prepared by
Building Code & Bushfire Hazard Solutions P/L



Andrew Muirhead

Bushfire Consultant
Diploma of Engineering

Building Code & Bushfire Hazard Solutions P/L



Stuart McMonnies

Manager Bushfire Section
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Certification number – BPAD 9400



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/>

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*.

Site plan by corner tone structures, Project Number 210429, Date 29/04/2021

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

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

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

Acknowledgements to:

Elevation Foundation Spatial Data – Geoscience Australia
Nearmap.com
NSW Department of Lands – SIXMaps
Street-directory.com.au

Attachments

Attachment 01: s4.14 Compliance Certificate

Attachment 02: Bushfire Attack Assessment Report



Building Code & Bushfire Hazard Solutions

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BUSHFIRE RISK ASSESSMENT CERTIFICATE UNDER PART 4 DIVISION 4.3 SECTION 4.14 OF THE EP&A ACT 1979 NO 203

PROPERTY ADDRESS:	41 Coaster Retreat, Coaster Retreat
DESCRIPTION OF PROPOSAL:	Sole Occupancy Dwelling
PLAN REFERENCE: (relied upon in report preparation)	Plans by cornerstone structures, Project Number 210429, Date 29/04/2021
BAL RATING:	BAL 40 <small>(If the BAL rating is FZ the application is to be referred to NSW RFS for assessment)</small>
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	YES NO <small>(Circle the relevant response)</small> <small>(If YES the application is to be referred to NSW RFS for assessment)</small>
BUSHFIRE ASSESSMENT REPORT REFERENCE:	201569
REPORT DATE:	7 th May 2021
CERTIFICATION NO/ACCREDITED SCHEME	BPAD9400

I Stuart McMonnies of Building Code and Bushfire Hazard Solutions Pty Ltd hereby certify, in accordance with Part 4 Division 4.3 Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*:

- That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and
- That subject to the recommendations contained in the Bushfire Risk Assessment Report the proposed development conforms specifications and requirements of the documents entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other documents as prescribed by Part 4 Division 4.3 Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*.

I am aware that the Bushfire Assessment Report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2019*.

Signature:  Date: 7th May 2021





NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date:

9/11/2020

Assessment Date:

7/07/2020

Site Street Address: 41 Coasters Retreat, Coasters Retreat

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: Southeast

Vegetation Information

Vegetation Type: Northern Hinterlands WSF (Grassy)

Vegetation Group: Wet Sclerophyll Forests (Grassy)

Vegetation Slope: 10 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 20

Overall Fuel Load(t/ha): 33.1

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 10 Degrees

Site Slope Type: Upslope

Elevation of Receiver(m): Default

APZ/Separation(m): 12

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 40

Peak Elevation of Receiver(m): 6.7

Radiant Heat(kW/m2): 35.28

Flame Angle (degrees): 51

Flame Length(m): 11.8

Maximum View Factor: 0.533

Rate Of Spread (km/h): 1.2

Inner Protection Area(m): 7

Transmissivity: 0.87

Outer Protection Area(m): 5

Fire Intensity(kW/m): 20587