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BUSHFIRE CONSULTING SERVICES PTY LTD
Designing Bushfire Protection Measures

Reference: J24/0803
Date of Issue: 20 March 2024

2024
Bush Fire Assessment Report

In relation to the proposed additions and alterations

At: 5 Sturdee Lane Elvina Bay
Lot 1 DP 1299366

(subject site)

Contents

1. Introduction 9
2. Purpose of this Report 9
3. Location 10
4. Property Description 11
   4.1 Zoning 11
   4.2 Biodiversity Values 12
   4.3 The Proposal 13
5. Site Assessment 13
6. Bush Fire Attack Assessment 14
   6.1 Determine Vegetation Formations 14
   6.2 The effective slope 15
   6.3 Fire Weather 16
   6.4 Determination of APZs 16
   6.5 Identify Construction Requirements 18
7. Bush Fire Protection Measures 19
   7.1 Asset Protection Zones 20
   7.2 Access 21
   7.3 Water Supplies 21
   7.4 Electricity Services 23
   7.5 Gas Services 23
   7.6 Construction Standards 24
   7.7 Landscaping 24
8. Likely Impact of any BPMs 25
9. Recommendations 25
10. Summary 28
11. References 29

12. Legislation 30

Appendix 1 - Site Plan 31

Appendix 2 – Photos of Site and Surrounds 32

Appendix 3 – Bushfire Risk Assessment Certificate 35

Appendix 4 - Modifications of section 7.5 of PBP 37

Document Tracking

Item	Detail
Project Name	Bush Fire Assessment Report, proposed additions and alterations
Project Address	Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay
Client Name	Studio_P
Project Number	J24/0803
Plan Reference	Plans by Studio_P revision 6 dated 20/03/2024
Prepared by	Laura Richards
Approved by	Laura Richards
BAL under AS3959-2018	BAL FZ and the relevant additional construction requirements of PBP section 7.5

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Document Control

Version	Primary Author	Description	Date Completed
1	Laura Richards	Draft	14/03/2024
2	Catherine Gorrie	Final	20/03/2024
3	Catherine Gorrie	Final- updated Plans	21/03/2024

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Any recommendation or advice expressed in this report is made in good faith and in accordance with the relevant legislation for bushfire prone development in New South Wales. Bushfire Consulting Services Pty Ltd has endeavoured to ensure that the information in this document is correct. However, many factors outside our current knowledge or control affect the recipient's needs and project plans. Bushfire Consulting Services Pty Ltd does not warrant or represent that the document is free from error or omissions and does not accept liability for any errors or omissions. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information. To the fullest extent possible Bushfire Consulting Services Pty Ltd excludes any express or implied warranty as to condition, fitness, merchantability or suitability of this document and limits its liability for direct or consequential loss at Bushfire Consulting Services Pty Ltd option to re-supplying the document or the cost of correcting the document. In no event shall Bushfire Consulting Services Pty Ltd responses to questions or any other information in this document be deemed to be incorporated into any legally binding agreement without the express written consent of an officer of Bushfire Consulting Services Pty Ltd.

It should be borne in mind that the measures recommended in this report cannot guarantee that a building will survive a bushfire event on every occasion. This is due to the degree of vegetation management, the unpredictable behaviour of bushfires and extreme weather conditions. As such, the author is not liable to any person for any damage or loss whatsoever which has occurred or may occur in relation to the person taking action or not taking action based on the recommendations of this report.

NOTE: This bush fire assessment shall remain valid for 12 months from the date of issue.

Executive Summary

Bushfire Consulting Services was commissioned by Studio_P to provide a bush fire assessment for the proposed additions and alterations at Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay. The subject site is mapped as designated bush fire prone land by Northern Beaches Council and is located within 100 metres of bush fire prone (hazardous) vegetation. The bush fire attack level (BAL) associated with the development of the subject building has been assessed as BAL FZ.

The proposal is a form of infill development and, as such, this report makes recommendations in accordance with the aim, objectives, and performance criteria of Chapter 7 of the NSW RFS document '*Planning for Bush Fire Protection*' (PBP) (NSWRFS 2019). The recommendations address the required bush fire protection measures, including:

- establishment and maintenance of asset protection zones (APZs)
- siting and design of the development
- construction requirements under AS3959-2018 (Standards Australia 2018)
- adequate access for emergency personnel
- adequate water supply, and utility requirements to reduce the risk of ignition by electrical or gas supplies
- landscaping to reduce the risk of ignition by embers, and to minimise flame contact and radiant heat on the proposed development.

Where all recommendations are implemented, the report concludes that the proposal can comply with the aim, objectives and performance criteria of PBP.

Compliance Summary

This Assessment has been Certified by: Catherine Gorrie BPAD-Level 3 Accredited Practitioner FPAA Cert No: BPAD20751	
What is the recommended level of compliance with AS3959-2018?	BAL FZ
Can this proposal comply with AS 3959-2018?	Yes
Does this development comply with the aim and objectives of PBP?	Yes
Is referral to the NSW Rural Fire Service (RFS) required?	Yes

List of Abbreviations

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018, *Construction of Buildings in Bushfire Prone Areas*
BAL	Bushfire Attack Level
BPAD	Bushfire Planning and Design (Accreditation Scheme)
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches Council
DA	Development Application
DEM	Digital Elevation Model
EP&A Act	*Environmental Planning and Assessment Act – 1979*
FDI	Fire Danger Index
FPAA	Fire Protection Association of Australia
IPA	Inner Protection Area
kW/m^2	Kilowatts per metre squared
LiDAR	Light Detection and Ranging
LPMA	Land & Property Management Authority
NCC	National Construction Code
PBP	*Planning for Bush Fire Protection 2019*
RF Act	*Rural Fires Act – 1997*
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SIX	Spatial Information Exchange
SWS	Static Water Supply

1. Introduction

This report has been commissioned by Studio_P to provide a bush fire assessment for the proposed additions and alterations at Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay.

The subject property is "bushfire prone land" as per the local Council bushfire prone land map as defined by section 10.3 (s10.3) of the *Environmental Planning & Assessment Act (EP&A) 1979* and therefore the requirements stipulated by legislation apply to any new development on the site.

Planning for Bush Fire Protection 2019 (Chapter 7) describes this type of development as "infill development" and therefore the requirements of section 4.14 (s4.14) of the *EP&A Act* are applicable.

The bush fire assessment and recommendations are derived from the *NSW EP&A Act*, the Rural Fire Service document *Planning for Bush Fire Protection 2019* and Australian Standard 3959-2018 '*Construction of Buildings in Bushfire Prone Areas*'.

2. Purpose of this Report

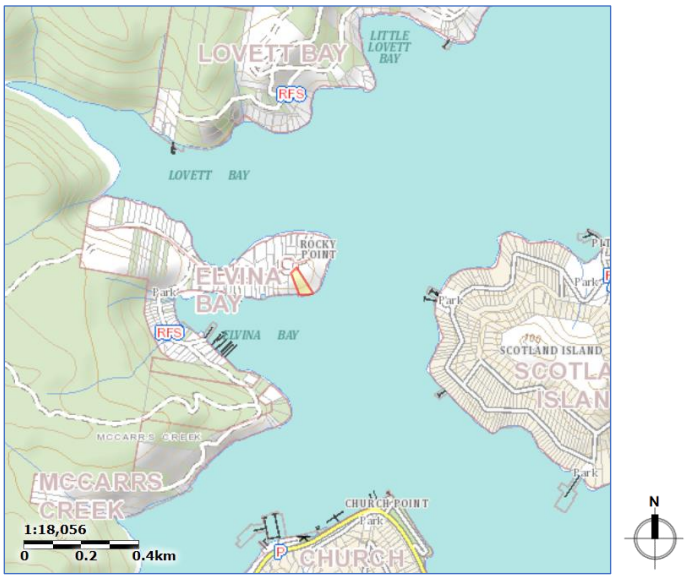
The purpose of this report is to provide the owners, the Consent Authority, the Certifier and the Rural Fire Service with a description of the proposed development as well as the vegetation type, slope and any other factors influencing the likely bushfire behaviour, sufficient to show that the development will be protected from the likely bushfire threat as outlined in current legislation.

This assessment includes an analysis of the hazard, threat and subsequent risk to the development and provides recommendations that satisfy the aim and objectives of Planning for Bush Fire Protection.

3. Location

The site is located and known as Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay. The property is part of the Northern Beaches local government area.

Figure 1. Location Map. Source: LPMA SIX Viewer (NSW Government 2024a)



Site location outlined in red

Figure 2. Aerial Map. Source: LPMA SIX Viewer (NSW Government 2024a)

Site location outlined in red

Figure 3. Bushfire Prone Land Map. Source: NSW Government Planning Portal (NSW Government 2024b)

Site location outlined in yellow

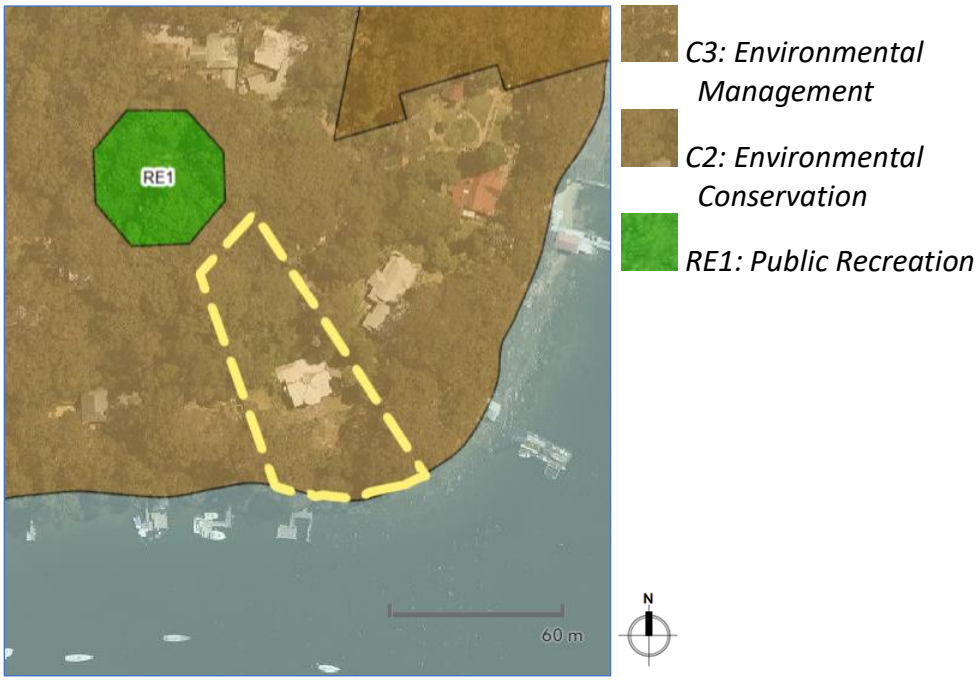
4. Property Description

The property is comprised of Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay, covering approximately 3700m^2 in area (Figure 2). It is bounded by Sturdee Lane to the approximate northwest, private allotments to the approximate east, and west and a natural waterway to the approximate south. It currently contains a single occupancy development, comprising a two storey dwelling, to be retained.

4.1 Zoning

The land is zoned C3: Environmental Management under Pittwater Local Environmental Plan/SEPP 2014. Adjacent lands to the north, east and west are similarly zoned, with adjacent lands to the south zoned W1: Natural Waterways (Figure 4).

Figure 4. Zoning Map. Source: NSW Government Planning Viewer (NSW Government 2024b)



Site location outlined in yellow

4.2 Biodiversity Values

A search of the NSW Office of Environment and Heritage's Biodiversity Values Map (NSW Government 2024c) has been carried out which indicates land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. It may be necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of the proposed development.

Figure 5: Biodiversity Values Map: NSW Government Planning Viewer (NSW Government 2024b)

https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

Site location outlined in yellow
Areas mapped in purple indicate land with high values

4.3 The Proposal

The proposal is for additions and alterations to the existing dwelling, comprising of a second storey and a deck, a paved deck, a deck extension, changes to windows and doors, various internal alterations, and an inclinator. In terms of the NCC, the classification of the building is Class 1a, 10a and 10b.

5. Site Assessment

Bushfire Consulting Services Pty Ltd attended the site on 8 December 2023. The assessment relates to the new development shown in the site plans (reference Appendix 1 below). The NSW Spatial Services mapping website has also been used as a reference (NSW Government 2024a), and 'Ocean Shores to Desert Dunes' by David Keith (Keith 2004), in determining the vegetation type.

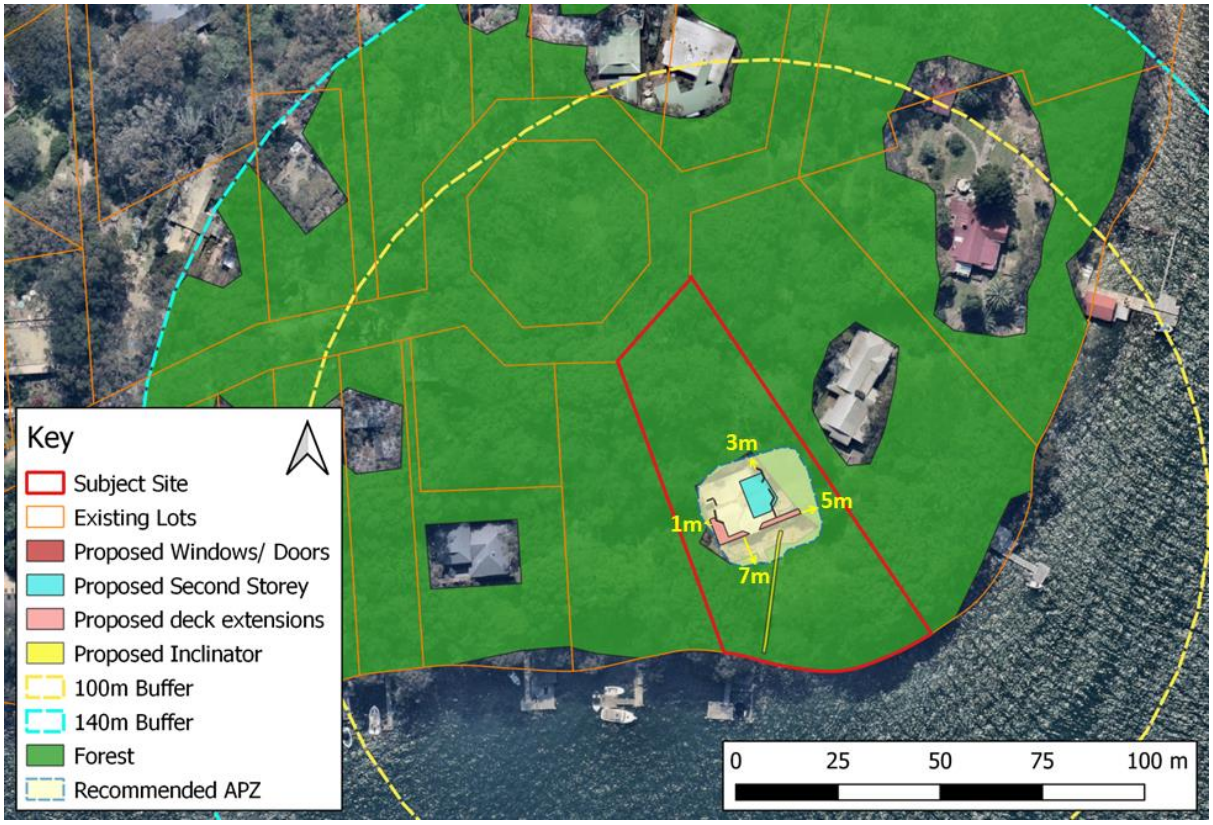
6. Bush Fire Attack Assessment

6.1 Determine Vegetation Formations

The hazardous vegetation formations for each aspect of the development within 140m of the asset have been identified according to Keith (2004). The bushfire threat emanates from bushland located to the northeast, southeast, southwest and northwest of the subject building. This includes vegetation both within and external to the subject site boundaries.

Based on a site visit and determination of vegetation formation using the Keith (2004) Identification Key, the primary bushland vegetation having the potential to affect the subject building is most representative of Forest in all directions.

Figure 6. Hazardous vegetation affecting the subject building. Source: NearMap (2024) with overlays by BFCS P/L. Aerial Photography date: 21/01/2024



Subject site outlined in red

6.2 The effective slope

The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the level of radiant heat flux. The effective slope of the land from the new building for a distance of 100m is derived from a site assessment combined with the most detailed contour data available. The slope is then categorised into one of following classes, relative to the location of the hazard:

all upslope vegetation (considered 0 degrees)

>0 to 5 degrees downslope vegetation

>5 degrees to 10 degrees downslope vegetation

>10 degrees to 15 degrees downslope vegetation, and

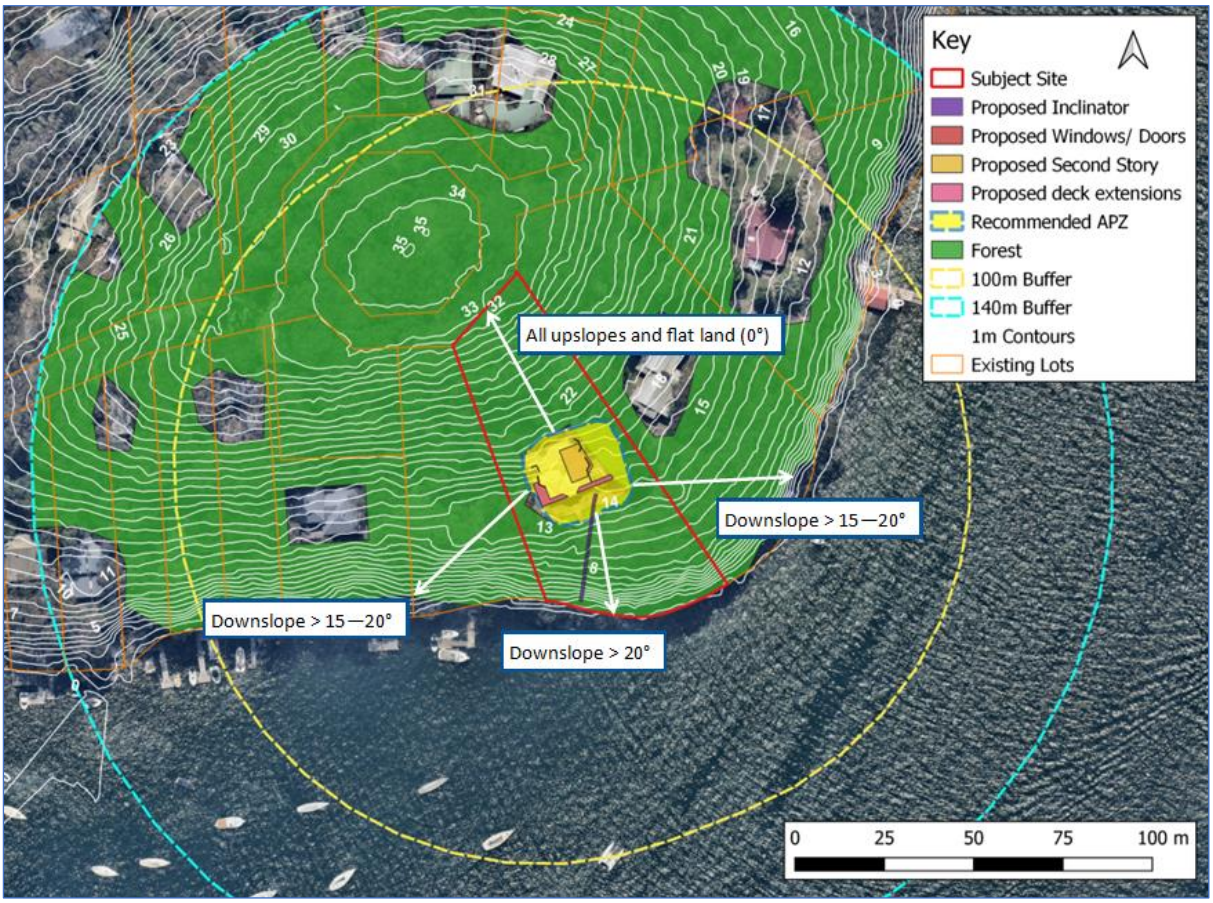
>15 degrees to 20 degrees downslope vegetation.

1m DEM data is sourced from NSW Spatial Services which is captured using LiDAR and has a horizontal accuracy of 0.3m and vertical accuracy of 0.8m at 95%.

The effective slope has been measured manually on site over a distance of 100m from the proposed development where accessible, under the classified vegetation community constituting the hazard. The slope was found to be consistent with the topographical information from NSW Spatial Services LiDAR data.

Direction from Building Footprint	Slope Description
Northeast	Downslope > 15 - 20°
Southeast	Downslope > 20°
Southwest	Downslope > 15 - 20°
Northwest	All upslopes and flat land (0°)

Figure 7. Slope Diagram. Source: NearMap (2024) and LiDAR (NSW Government 2024a) with overlays by BFCS P/L: Aerial Photography Date: 21/01/2024



Site location outlined in red, 1m contours

Northeast slope is ((15-1)/45.84) x 1/tan = Downslope 16.9°

Southeast slope is ((13-0)/24.1) x 1/tan = Downslope 28.3°

Southwest slope is ((14-1)/48.24) x 1/tan = Downslope 15.08°

Northwest slope is All upslopes and flat land (0°)

6.3 Fire Weather

The development is located in the Northern Beaches Council area, a part of the Greater Sydney Region, which has a Fire Danger Index of 100.

6.4 Determination of APZs

An Asset Protection Zone (APZ) is a fuel-reduced area surrounding a built asset or structure. An APZ provides a buffer zone between a bush fire hazard and an asset and an area of reduced bush fire fuel that allows suppression of fire. It also provides an area from which backburning or hazard reduction can be

conducted, and allows emergency services access as well as providing a relatively safe area for firefighters and home owners to defend their property.

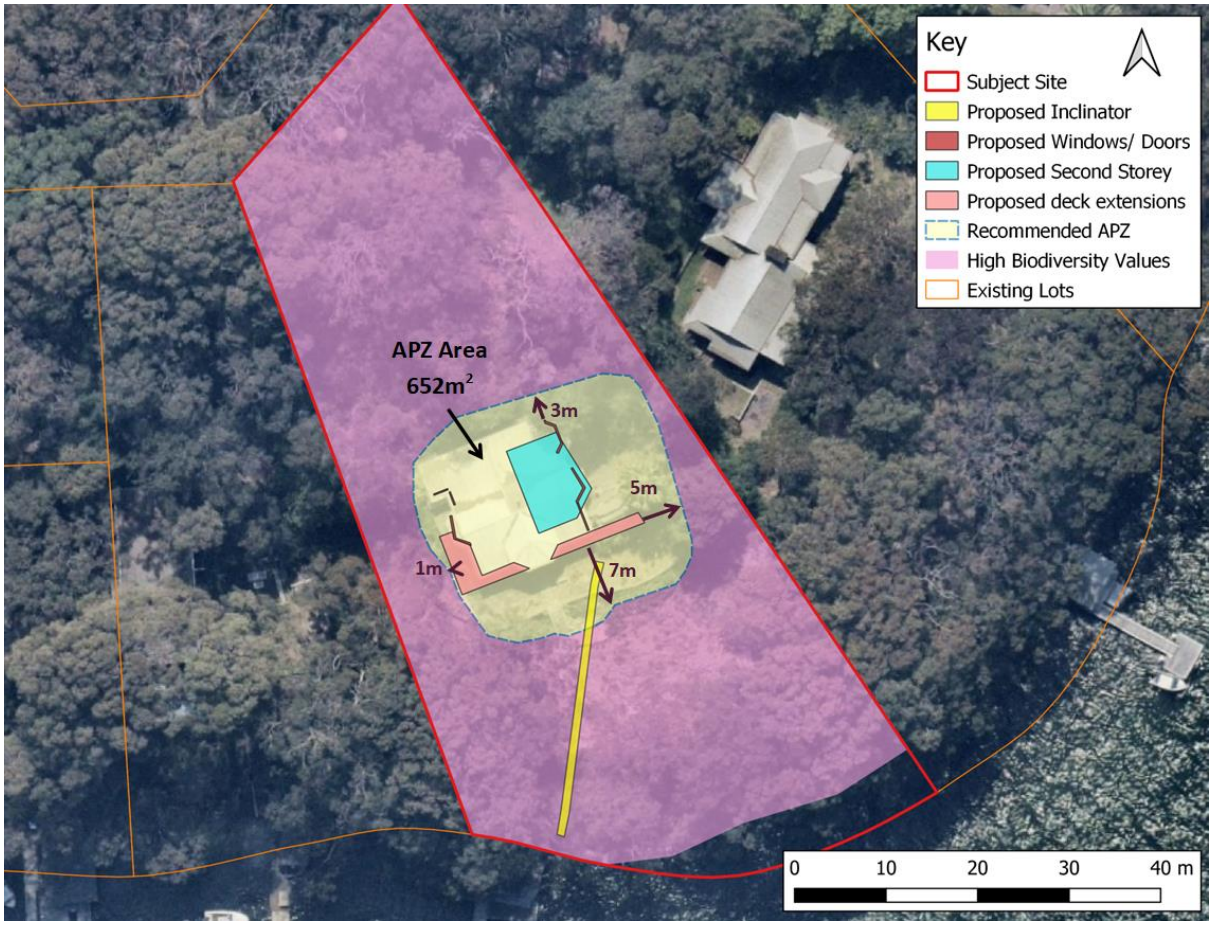
Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy. PBP has minimum specifications for APZs to be established around a dwelling to be managed as an Inner Protection Area (IPA).

An IPA should provide a tree canopy cover of less than 15% and have minimal fine fuel at ground level, the grass mowed on a frequent basis, trees and shrubs retained as clumps or islands and do not take up more than 20% of the area, trees and shrubs located far enough from buildings so that they will not ignite the building, garden beds with flammable shrubs not located under trees or within 10 metres of any windows or doors, minimal plant species that keep dead material or drop large quantities of ground fuel, tree canopies not located within 2 metres of the building, trees separated by 2-5 metres and do not provide a continuous canopy from the hazard to the building, and lower limbs of trees removed up to a height of 2 metres above the ground.

The minimum APZ is required to be 56m to the northeast, southeast and southwest and 24m to the northwest, which cannot be attained within the site boundaries. Construction commensurate with the available APZ is proposed. The entire lot excluding the area mapped as High Biodiversity Values is to be managed as a Defendable Space, which is a space which provides a safe working environment in which efforts can be undertaken to defend the structure, before and after the passage of a bush fire.

Vegetation within the defendable space must be kept to an absolute minimum and the area should be free from combustible items and obstructions. The Defendable Space is from the dwelling and additions for a distance of approximately 3m to the north, 5m to the east, 7m to the south and 1m to the west.

Figure 8: Recommended minimal APZ and Interaction with High Biodiversity mapped area: Source: Nearmap, SEED, BIOSET, Overlays by BFCS P/L



The recommended APZ does not interact with the High Biodiversity mapped area

6.5 Identify Construction Requirements

The appropriate construction requirements for the development are determined by matching the relevant FFDI, vegetation type, the distance measured from the edge of the unmanaged vegetation to the closest external wall to identify the BAL using the relevant tables from PBP. These construction requirements are located in section 3 of AS3959-2018. These requirements are varied by the applicable additional construction requirements of PBP section 7.5.

PBP Table A1.12.5 Determination of BAL, FFDI 100 – residential developments

Aspect	Distance from hazard	Vegetation Classification	Effective Slope Under Classified Vegetation	Bushfire Attack Level (BAL) required
Northeast	5m	Forest	Downslope > 15 - 20°	BAL FZ
Southeast	7m	Forest	Downslope > 20°	BAL FZ
Southwest	1m	Forest	Downslope > 15 - 20°	BAL FZ
Northwest	3m	Forest	All upslopes and flat land (0°)	BAL FZ

The assessment indicates that the subject building will experience radiant heat levels of >40kW/m^2 as a result of foreseeable local bushfires under conditions of an FDI of 100. The expected radiant heat levels translate to a Bushfire Attack Level (BAL) on the building of BAL FZ. Construction of any new development to BAL FZ specifications is 'primarily concerned with protection from ember attack, radiant heat and direct flame contact exceeding 40kW/m^2'.

7. Bush Fire Protection Measures

The BPMs for residential infill development include provisions relating to APZs, access, water supply, electricity and gas services, construction standards, landscaping and emergency evacuation. In order to create appropriate separation between a dwelling and the bush fire hazard, APZs commensurate with those specified for new subdivision must be provided.

7.1 Asset Protection Zones

PBP Table 7.4a Performance criteria and acceptable solutions for residential infill development

Performance Criteria	Acceptable Solutions/Comment
APZs are provided commensurate with the construction of the building	Construction commensurate with the available APZ is proposed. The lot excluding the area mapped as High Biodiversity Values is to be managed as a Defendable Space Inner Protection Area (IPA), which is a space which provides a safe working environment in which efforts can be undertaken to defend the structure, before and after the passage of a bush fire. Vegetation within the defendable space must be kept to an absolute minimum and the area should be free from combustible items and obstructions. The Defendable Space is from the dwelling and additions for a distance of approximately 3m to the north, 5m to the east, 7m to the south and 1m to the west
A defendable space is provided	Achieved as adequate defendable space is available to the front of the subject building and pedestrian firefighter access is available to the rear
APZs are managed and maintained to prevent the spread of a fire to the building	Achieved as the APZs are to be managed in accordance with the requirements of Appendix 4 of PBP

Performance Criteria	Acceptable Solutions/Comment
The APZ is provided in perpetuity	Achieved as APZs requirements will be specified in the Development Consent conditions
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	Achieved as the APZ is located on lands with a slope less than 18 degrees. The slope under the site APZ is <15°

7.2 Access

New access does not form a part of this application. Existing access is only available by boat.

7.3 Water Supplies

Performance Criteria	Acceptable Solutions/Comment
An adequate water supply is provided for fire-fighting purposes	Achieved as a static water supply of 10 000 L is to be provided
The integrity of the water supply is maintained	Achieved as any new above-ground water service pipes external to the building are to be metal, including and up to any taps
A static water supply is provided for firefighting purposes in areas where reticulated water is not available	A static water supply of 10 000 Litres is to be made available for fire suppression activities, provided with ▪ a connection for firefighting purposes is to be located within the IPA or non-hazard side and away from the structure ▪ a 65mm Storz outlet with a ball valve is to be fitted to the outlet ▪ ball valve and pipes are adequate for water flow and are metal

Performance Criteria	Acceptable Solutions/Comment
	▪ 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 ▪ 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 of AS 3959) ▪ unobstructed access can be provided at all times ▪ underground tanks are clearly marked ▪ tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters ▪ all exposed water pipes external to the building are metal, including any fittings ▪ A pump is to be provided, which is a minimum 5hp or 3kW petrol or diesel-powered pump, and shielded against bush fire attack ▪ a hose and reel for firefighting is provided and connected to the pump and shall be 19mm internal diameter

Performance Criteria	Acceptable Solutions/Comment
	▪ fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005

7.4 Electricity Services

Performance Criteria	Acceptable Solutions/Comment
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings	N/A as the electricity supply is existing

7.5 Gas Services

Performance Criteria	Acceptable Solutions/Comment
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Where applicable, reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and 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

7.6 Construction Standards

Performance Criteria	Acceptable Solutions/Comment
The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact	BAL FZ has been determined in accordance with PBP Table A1.12.5, The additional construction requirements of section 7.5 of PBP are to be incorporated into the development and are provided as an Appendix
Proposed fences and gates are designed to minimise the spread of bush fire	Any new fences and gates are to be constructed from non-combustible material only
Proposed Class 10a buildings are designed to minimise the spread of bush fire	There are no bush fire protection requirements for Class 10a buildings located more than 6m from a dwelling in bush fire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the NCC

7.7 Landscaping

Performance Criteria	Acceptable Solutions/Comment
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Achieved as any landscaping within the APZ is to comply with the NSW RFS 'Asset protection zone standards' (PBP Appendix 4) and Defendable Space requirements of PBP 3.2.4 A clear area of low-cut lawn or pavement is maintained adjacent to the house, and Trees and shrubs are located so that: ▪ The branches will not overhang the roof; ▪ The tree canopy is not continuous; and

Performance Criteria	Acceptable Solutions/Comment
	▪ Any proposed windbreak is located on the elevation from which fires are likely to approach

8. Likely Impact of any BPMs

The proposed bushfire protection measures will not adversely impact on the environment. It should be noted that this report has not focused on environmental issues and as such they may require further specialist investigation.

9. Recommendations

The following recommendations are made for the bushfire measures for the proposed residential development of additions and alterations at Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay, and are based upon the relevant provisions of the NSW Rural Fire Service Guideline entitled *Planning for Bush Fire Protection 2019*.

1. Asset Protection Zones

At the commencement of the development, and in perpetuity, the site is to be managed as a Defendable Space (PBP 3.2.4), from the dwelling and additions for a distance of approximately 3m to the north, 5m to the east, 7m to the south and 1m to the west. The Defendable Space provides a safe working environment in which efforts can be undertaken to defend the structure, before and after the passage of a bush fire.

Vegetation within the defendable space must be kept to an absolute minimum and the area should be free from combustible items and obstructions.

Trees

- 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

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.

2. Water Supply

A 10 000 Litre fire fighting water supply is to be provided near the proposal, provided with

i) a connection for firefighting purposes is to be located within the IPA or non-hazard side and away from the structure
ii) a 65mm Storz outlet with a ball valve is to be fitted to the outlet
iii) ball valve and pipes are adequate for water flow and are metal
iv) supply pipes from tank to ball valve have the same bore size to ensure flow volume
v) underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank
vi) a hardened ground surface for truck access is supplied within 4m
vii) above-ground tanks are manufactured from concrete or metal
viii) raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959)
ix) unobstructed access can be provided at all times
x) underground tanks are clearly marked

xi) tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters

xii) all exposed water pipes external to the building are metal, including any fittings

xiii) Provide a minimum 5hp or 3kW petrol or diesel-powered pump, shielded against bush fire attack

xiv) Provide a hose and reel for firefighting connected to the pump with a 19mm internal diameter

xv) fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.

3. Construction Standards

New construction shall comply with Sections 3 and 9 (BAL FZ) of AS3959-2018 '*Construction of buildings in bush fire-prone areas*', as varied by the applicable additional construction requirements of PBP section 7.5 (shown as Appendix 4 below). The concept of Shielding as described in s3.5 of AS3959-2018 cannot be applied.

4. Gas Services

Where applicable, reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 *The storage and handling of LP Gas* and 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.

5. Fences and gates

All new fences and gates are to be constructed from non-combustible material only.

6. Landscaping

Any new landscaping within the APZ is to comply with the NSW RFS '*Asset protection zone standards*' (PBP Appendix 4).

7. Emergency and Evacuation Planning

The need to formulate an emergency evacuation plan is suggested. To do so, occupants can complete a Bush Fire Safety Plan on the NSW RFS Website http://www.rfs.nsw.gov.au/ under publications / bushfire safety.

10. Summary

This report consists of a bush fire assessment for the proposed residential development of additions and alterations at Lot 1 DP 1299366, 5 Sturdee Lane Elvina Bay. The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.

This report has considered all the elements of bushfire attack and finds that the development has a Bushfire Attack Level of BAL FZ. The development satisfies the Objectives and Performance requirements of '*Planning for Bush Fire Protection'* 2019, subject to implementation of the recommendations made by this report.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains and although the standard is designed to improve the performance of such buildings, there can be no guarantee because of the variable nature of bushfires that any one building will withstand bushfire attack on every occasion.

This report is a bush fire assessment that provides the required information to assist local Council in determining compliance in accordance with Planning for Bush Fire Protection and AS3959-2018. The local Council is the final

consenting authority and the construction of the building must comply with the recommendations included in the Council's conditions of consent.

Catherine Gorrie

(a person who is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bush fire risk assessment)

Accredited Bushfire Planning and Design Practitioner

Fire Protection Association Australia BPAD-Level 3 (BPAD 20751)

Grad Dip Bushfire Protection (UWS 2010)

Diploma Environmental Health & Building Surveying (TAFE 2005)

Corporate Silver Member Fire Protection Association Australia

Bushfire Consulting Services Pty Ltd

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11. References

Keith D 2004, *Ocean Shores to Desert Dunes, the Native Vegetation of NSW and the ACT,* Department of Environment and Conservation, Sydney

NearMap 2023, *NearMap Photomap Aerial Imagery*, NearMap Australia, Barrangaroo, NSW

NSW Government 2023a, *NSW Spatial Services*, NSW Department of Finance, Services and Innovation.

NSW Government 2023b, *NSW Planning Portal*, NSW Department of Planning and Environment.

NSW Government 2023c, *Biodiversity Values Map*, NSW Department of Environment and Heritage.

NSW RFS 2019, *Planning for Bush Fire Protection*, NSW Rural Fire Service, Sydney.

Standards Australia 2018, *Australian Standard AS 3959-2018 'Construction of Buildings in Bushfire Prone Areas'*, SAI Global, Australia.

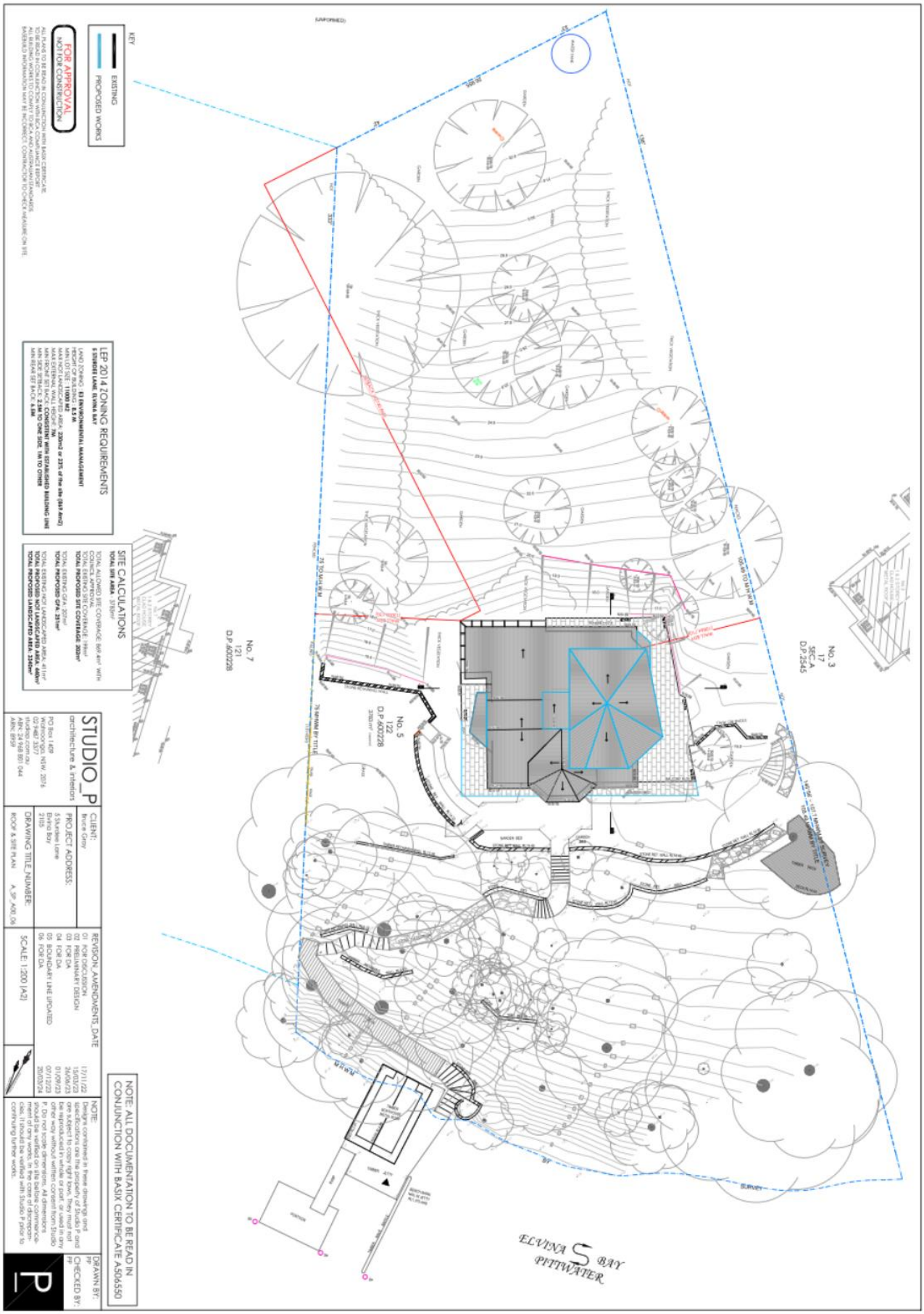
12. Legislation

Environmental Planning & Assessment Act 1979

Rural Fires Act 1997

Rural Fires Regulation 2013

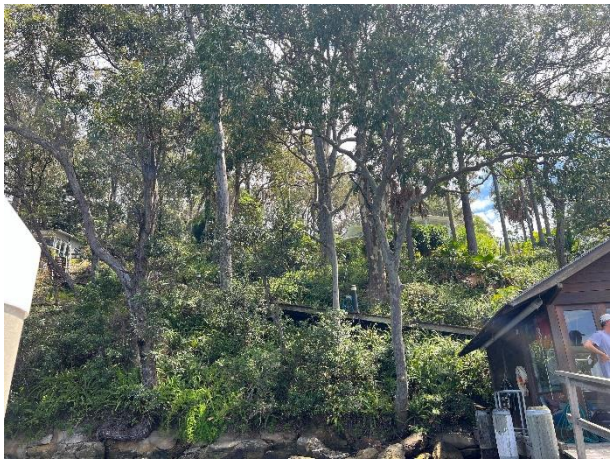
Appendix 1 - Site Plan



Appendix 2 – Photos of Site and Surrounds

Source: BFCS P/L 8/12/2023

Subject site



Vegetation within the subject site

Proposed location of ramp and inclinator

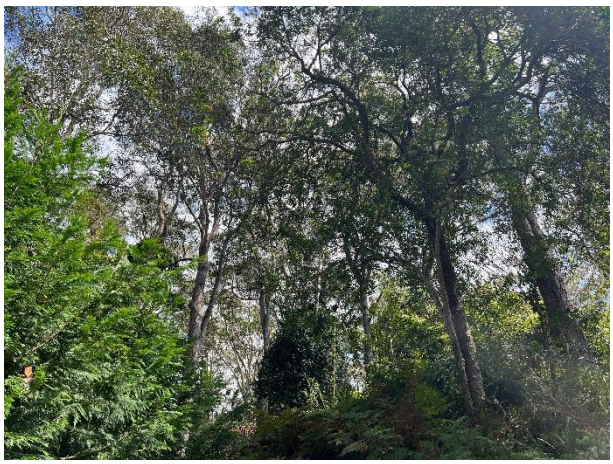
Vegetation to the northeast

Vegetation to the southeast

Vegetation to the southeast

Vegetation to the southwest

Vegetation to the southwest



Vegetation to the northwest

Appendix 3 – Bushfire Risk Assessment Certificate

This form is completed by a recognized consultant in bushfire risk assessment in accordance with section s4.14 of the *Environmental Planning and Assessment Act 1979 No 203*

PROPERTY ADDRESS:	Lot 1 DP 1299366 5 Sturdee Lane Elvina Bay
DESCRIPTION OF PROPOSAL:	Additions and alterations
PLAN REFERENCE: (relied upon in report preparation)	Plans by Studio_P revision 6 dated 20/03/2024
BAL RATING	BAL FZ (If the BAL rating is FZ the application is to be referred to NSW RFS for assessment)
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	YES NO (Circle the relevant response) (If YES the application is to be referred to NSW RFS for assessment)

I, Catherine Gorrie, of Bushfire Consulting Services Pty Ltd, have carried out a bushfire risk assessment on the above mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in Appendix 2 of *Planning for Bushfire Protection 2019* together with recommendations as to how the relevant specifications and requirements are to be achieved.

REPORT REFERENCE:	J24/0803
REPORT DATE:	20/03/2024
CERTIFICATION NO/ACCREDITED SCHEME:	BPAD-Level 3 Accredited Practitioner FPAA Cert No: BPAD20751

Note: this certificate must be completed and signed by a person recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment in accordance with s4.14 of *the EP&A Act 1979* No 203.

****

I hereby certify, in accordance with 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 attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements*.

* The relevant specifications and requirements being; 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 and any other document as prescribed by Section s4.14 of the *Environmental Planning and Assessment Act 1979 No 203.*

I am aware that the bush fire 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 Bush Fire Protection 2019*.

Attachments:

✅ Bush Fire Risk Assessment Certificate

✅ Recommendations

✅ Statement of vegetation impact in relation to APZ

SIGNATURE:

DATE: 20/03/2024

Appendix 4 - Modifications of section 7.5 of PBP

7.5 Additional construction requirements

To ensure the performance criteria for construction standards given in section 7.4 can be met, PBP adopts additional measures over and above AS 3959 and NASH Standard as follows:

- construction measures for ember protection at BAL-12.5 and BAL-19 provided by AS 3959
- construction measures for development in BAL-FZ; and
- requirements over and above the performance criteria contained within AS 1530.8.1 and AS 1530.8.2 apply in regards to flaming.

7.5.1 Ember protection

Based on the findings from the 2009 Victorian Bush Fires Royal Commission, PBP aims to maintain the safety levels previously provided by AS 3959:1999 in relation to ember protection at lower Bush Fire Attack Levels.

In particular, the areas addressed are in relation to:

- sarking;
- subfloor screening;
- floors;
- verandas, decks, steps, ramps and landings;
- timber support posts and beams; and
- fascias and bargeboards.

7.5.2 NSW State Variations under G5.2(a) (i) and 3.10.5.0(c)(i) of the NCC

Certain provisions of AS 3959 are varied in NSW based on the findings of the Victorian Bush Fires Royal Commission and bush fire industry research.

The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC;

- clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall:
    - be non-combustible; or

        - comply with AS/NZS 4200.1, be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and
- clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and
- clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and
    - fascias and bargeboards, in BAL-40, shall comply with:
    - clause 8.4.1(b) of AS 3959; or
    - clause 8.6.6 of AS 3959.

7.5.3 Construction in the flame zone

The flame zone is the area that has significant potential for sustained flame contact during a bush fire. The flame zone is determined by the calculated distance at which the radiant heat of the design fire exceeds 40kW/m².

The NCC references AS 3959 and the NASH Standard. The NSW variation to the NCC excludes both AS 3959 and the NASH Standard as a Deemed to Satisfy solution for buildings that are required to be constructed to BAL-FZ as defined in AS 3959.

Although Chapter 9 of AS 3959 and the NASH Standard has not been adopted, they should still be used as a basis for a performance based solution demonstrating compliance with the performance requirements of the NCC and PBP for construction in the flame zone.
All flame zone developments should be sited and designed to minimise the risk of bush fire attack. Buildings should be designed and sited in accordance with appropriate siting and design principles to ensure the safest protection from bush fire impacts.

7.5.4 Flaming

Materials that allow flaming can be problematic and are not supported by the NSW RFS for the following reasons:

- flaming materials increase the exposure of other elements of construction and the adjoining structure to flame contact after a bush fire front has passed; and
- flaming materials will potentially increase the exposure of occupants of the building to radiant heat, direct flame contact, smoke after a bush fire front has passed.

This increase in exposure can contribute to the risk of loss of life and compromise the ability of residents to defend their property and egress from the building once the bush fire front has passed. In addition, it can reduce the ability of occupants to make safe and effective decisions about their safety. Where there is potential for materials of construction to ignite as a result of bush fire attack, the proposed building solution generally fails the construction performance criteria for residential infill development.

For development which may be subject to flame contact (BAL-40 and BAL-FZ), systems tested in accordance with AS 1530.8.1 and AS 1530.8.2 respectively will be considered, except that there is to be no flaming of the specimen except for:

- window frames that have passed the criteria of AS 1530.8.1 and AS 1530.8.2, may be approved provided their flaming is not considered to compromise the safety of other elements of the building; and
- use of other minor elements which allow flaming may be considered provided they do not compromise the integrity of the fire safety of the building (examples include address numbers, house names, decorative artwork, etc).

Flaming of other more significant elements of the building (such as aesthetic wall cladding) is considered to pose an unacceptable risk and will not be supported.