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NEWCASTLE SYDNEY

Bushfire Threat Assessment

Proposed Residential Infill Development
4 Fleet Street, Salamander Bay, NSW



Prepared for: Wanda Beach Estate Pty Ltd

18 September 2024

AEP Ref: 5075

Revision: 01

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1.0 Introduction

A residential infill development is proposed within land identified as 4 Fleet St, Salamander Bay, NSW (the Subject Site). At the request of Wanda Beach Estate Pty Ltd (the client), Anderson Environment & Planning (AEP) have undertaken the necessary investigations to inform the production of a Bushfire Threat Assessment (BTA) report addressing the proposed development.

This report is specifically intended to assess the bushfire protection measures required by the NSW Rural Fire Service's "Planning for Bushfire Protection 2019" (The PBP) and the construction requirements of the proposed development in accordance with the provisions of the Building Code of Australia – Volume 2, Edition 2022 and Australian Standard 3959-2018 (AS 3959) – "Construction of buildings in bushfire-prone areas".

As per PBP 2019,

Under EP&A Act s4.14, all development on BFPL must comply with PBP. The consent authority must be satisfied that the development conforms to PBP, if not it must consult with the Commissioner of the NSW RFS. Infill developments will be considered in accordance with the acceptable solutions and performance criteria specified in section 7.4.

As the proposal will involve an intensification of residential density consideration has also been given to Section 8.2.1 of PBP 2019.

This BTA includes an assessment of the proposed development against applicable acceptable solutions and performance criteria for both Section 7.4 and Section 8.2.1.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2024). *Bushfire Threat Assessment for Proposed Residential Infill Development at 4 Fleet Street, Salamander Bay, NSW*. Unpublished report for Wanda Beach Estate Pty Ltd, September 2024.

2.0 Site Particulars

The proposed residential infill development is described as follows.

Table 1 – Site Particulars

Item	Comments
Client	Wanda Beach Estate Pty Ltd
Address	4 Fleet Street, Salamander Bay, NSW
Title(s)	Lot 1 DP 285191
Study Area	Entirety of Subject Site plus vegetation out to 140m
Subject Site	Entirety of Lot 1 DP 285191
LGA	Port Stephens
Zoning	R2 – Low Density Residential
Current Land Use	Residential dwellings in various states of repair are present within the lot.
Surrounding Land Use	Surrounding land use includes: • Residential development to the east; • A vegetated riparian zone to the north with residential development beyond the vegetated riparian zone; • An over 50s lifestyle community to the south beyond Fleet Street; and • A managed asset protection zone (APZ) with remnant forest vegetation beyond the APZ.

Figure 1 depicts the extent of the Subject Site overlain on an aerial photograph of the locality.

3.0 Proposed Development

The proposed residential infill development incorporates the following –

- Construction of multi-dwelling housing and community title subdivision (including part change of use element), including:
- Construction of 32 new townhouses (mix of two & three storeys, and three storeys with basement), comprising:
 - 30 x 3 bedroom units (an alternative floor plan is provided for typology 2, which includes 5 x 4 bedroom units, depending on market demands. This is to be considered as an option for DA assessment, however, does not contribute to addition unit counts).
 - 2 x 2 bedroom Units
- Conversion of all existing units (36) to dwellings. A total of 25 do not require any development works, while 11 require minor alterations including interior renovations and addition of awning and deck to each.
- Construction of internal road network (Angel Close) to connect to existing.
- Conversion of existing tennis court to landscaped area.
- Construction of five (5) double garages and three (3) larger storage buildings (for use by caravans etc) adjoining Fleet Street.
- Stormwater Infrastructure & Landscaping works.

The above development will replace the built works approved under DA 16-2015-448-1 (multi-dwelling housing), and DA 16-2018-121-1 (seniors housing), noting vegetation removal works approved under

this DA have been completed. Demolition works approved under DA 16-2022-691-1 have also been completed.

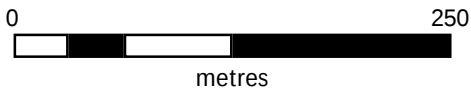
Figure 2 depicts the plan of proposed development within the Subject Site.

Not For Submission

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

 Subject Site



Note:
1. Boundaries are not survey accurate
2. Do not rely on this plan



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Figure 1 - Site Location

Date: Sept 2024

Location: 4 Fleet St, Salamander Bay, NSW

Client: Wanda Beach Estate Pty Ltd

AEP Ref: 5075

Figure 2 – Proposed Development Plan

Not For Submission

4.0 Bushfire Hazard Assessment

4.1 Bushfire Prone Land Mapping

Examination of the NSW Planning Portal (2021) Bushfire Prone Land Mapping confirmed that the Subject Site is mapped as “Vegetation Buffer” and “Vegetation Category 1”. This designation triggers the need for the assessment for the proposed residential infill development. **Figure 3** depicts the Bushfire Prone Land Mapping.

Appendix 1 of the PBP provides the steps required to determine the level of bushfire hazard that applies to the Subject Site. Factors influencing the hazard level include:

- The formation of vegetation surrounding the Subject Site (as defined by Keith 2004);
- The distance between vegetation and the Subject Site (or proposed buildings therein);
- The effective slope for each patch of vegetation; and
- The Fire Danger Index (FDI) of the council area within which the development occurs.

These factors together provide an indication of the level of threat posed to the development from any vegetation retained within the Subject Site and surrounding vegetation in the event of a bushfire, and the required mitigation measures to be taken in the form of Asset Protection Zones (APZs) and building construction standards. These measures are detailed further in **Section 5** below.

4.2 Vegetation and Slope Analysis

The Subject Site and surrounds occur within the Greater Sydney Region, with existing vegetation subsequently classified with a Fire Danger Index (FDI) of 100 as per NSW Rural Fire Service (2017) NSW Local Government Areas FDI.

Site investigation showed that hazard vegetation present within 140m of the Subject Site boundary constitutes native vegetation and is classified as ‘Forest’ under the PBP. The Forest vegetation occurs to the west of the Subject Site along with remnant vegetation to the north that is part of the Stoney Ridge Reserve.

Vegetation communities present within the 140m surrounding the development and slope assessment within 100m from hazard vegetation are shown in **Table 2** and **Figure 4**.

Table 2 – Hazard Vegetation and Slope Assessment

Aspect	Hazard Vegetation (140m)	Effective Slope (100m)	Required Asset Protection Zone (m)
North	Remnant Vegetation	Downslope 0-5°	14
North East	-	-	-
East	-	-	-
South East	-	-	-
South	-	-	-
South West	Forest Vegetation	Downslope 5-10°	36
West	Forest Vegetation	Downslope 5-10°	36
North West	Forest Vegetation	Downslope 5-10°	36

Appendix A contains photos showing the vegetation types within the 140m vegetation assessment buffer around the Subject Site.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

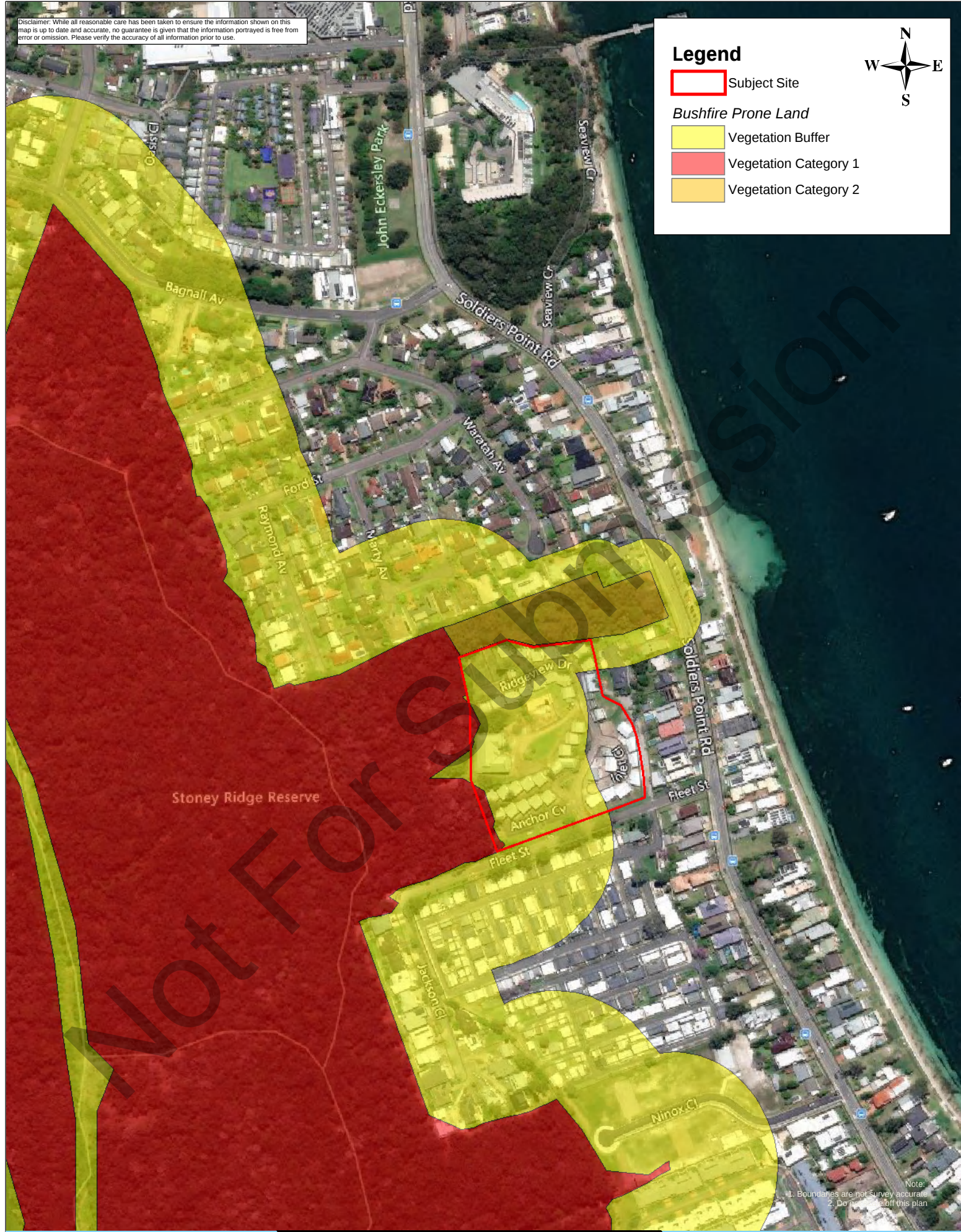
 Subject Site

Bushfire Prone Land

 Vegetation Buffer

 Vegetation Category 1

 Vegetation Category 2



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Figure 3 - Bushfire Prone Land Map

Date: Sept 2024

Location: 4 Fleet St, Salamander Bay, NSW

Client: Wanda Beach Estate Pty Ltd

AEP Ref: 5075

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Subject Site
- Approved 50m APZ
- 100m Slope Assessment
- 140m Vegetation Assessment
- Rainforest/Remnant Vegetation
- Forest Vegetation
- Existing Approved Firetrail
- Proposed changes to firetrail
- Existing area of firetrail to be upgraded
- 2m Contour



0 150
metres

Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



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Figure 4 - Slope and Vegetation Assessment

Date: Sept 2024

Location: 4 Fleet St, Salamnader Bay, NSW

Client: Wanda Beach Estate Pty Ltd

AEP Ref: 5075

4.3 PBP Performance Criteria Assessment – Infill Development

PBP 2019 refers to residential infill development as development of land by the erection of, alteration or addition to, a dwelling which does not require the spatial extension of services including public roads, electricity, water or sewerage and is within an existing lot. Under EP&A Act s4.14, all development on BFPL must comply with PBP 2019. The consent authority must be satisfied that the development conforms to PBP, if not it must consult with the Commissioner of the NSW RFS. Infill developments will be considered in accordance with the acceptable solutions and performance criteria specified in section 7.4 (refer to **Table 3**). As the proposal leads to an increase in residential density further consideration is needed under section 8.2.1 of PBP 2019 (refer to **Table 4**).

Table 3 – Performance Criteria Measures for Infill Development

Performance Criteria	Acceptable Solutions	Assessment
Asset Protection Zones		
APZs are provided commensurate with the construction of the building;	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	A 50m APZ has been previously approved, implemented and provided directly to the west of the proposed development and is under the ownership of the same group as the proposed development. An APZ off the vegetation to the north is not possible to achieve given the currently present dwellings. All new buildings are located outside of the required APZs. APZs are located on land with slopes less than 18 degrees. Refer Figure 5 There are registered fire trails within the vegetation to the west that are maintained and provide access to the hazard vegetation to the west as well as the APZ area.
APZs are managed and maintained to prevent the spread of a fire to the building	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	
The APZ is provided in perpetuity	APZs are wholly within the boundaries of the development site. APZ are located on lands with a slope less than 18 degrees.	
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are wholly within the boundaries of the development site. APZ are located on lands with a slope less than 18 degrees.	
Home-based child care: the building must not be exposed to radiant heat levels exceeding 29kW/m ² (1090K).	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in PBP Appendix 1.	N/A
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Property access roads are two-wheel drive, all weather roads.	Access from existing public road, Fleet Street and all internal roads are two-wheel drive, all weather roads. There are registered fire trails within the vegetation to the west that are maintained and provide access to the hazard vegetation to the west as well as the APZ area on the western side of the development.

Performance Criteria	Acceptable Solutions	Assessment
The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	Sufficient road capacity surfaces on internal access and Fleet St is to be provided.
There is appropriate access to water supply.	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021;	Hydrants are to be provided in accordance with the relevant clauses of AS 2419. 1:2021; Additional hydrants are proposed at the western side of the development.
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	N/A – no static water proposed
Firefighting vehicles can access the dwelling and exit the property safely.	At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;	Dwellings are located less than 200 metres from a public through road. The internal road (Ridgeview Drive) in the north has a turning area provided. The southern internal (Anchor Cove) road has a gate proposed at the western edge that can be used in the case of an emergency to exit onto Fleet St. The local RFS is to be provided with a key or other way of opening this gate. The central internal road (Angel Close) is a dead end with a turning area proposed that meets the requirements in Appendix 3.3 of PBP 2019. This road is to be clearly signposted as a dead end with limited turning capacity.
	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.	There are dwellings within the proposed development that are more than 70m from the nearest public access road. Each dwelling will be accessible by internal paved roads.
	In circumstances where this cannot occur, the following requirements apply: minimum 4m carriageway width; in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a	The internal carriageway is generally 4.5m in width throughout though there are some constrictions down to 3.5m in width constrained by existing cabins. These constrictions are limited in length and interspersed by wider areas.

Performance Criteria	Acceptable Solutions	Assessment
	minimum trafficable width of 6m, at the passing bay; a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; property access must provide a suitable turning area in accordance with PBP Appendix 3; curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; the minimum distance between inner and outer curves is 6m; the crossfall is not more than 10 degrees; maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.	Inner curves are to be delivered to a minimum radius of 6m. The distance between the inner and outer curve is approximately 5.5m, though roll top kerbing throughout and setback from buildings allows for additional room to manoeuvre. Crossfall is not to exceed 3 degrees and the maximum grade of the road should be less than 10 degrees given the slopes associated with the site. A vertical clearance of 4m is to be provided at all times along the roads.
	Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.	Some short constrictions apply based on the layout of the previous dwellings that already exist within the site. These constrictions are less than 30m in length before opening out again to the 4.5m general road width.
Water Supply		
An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available; and	The development will be serviced by reticulated water.
	A static water supply is provided where no reticulated water is available.	N/A
Water supplies are located at regular intervals; and	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021;	Fire hydrant spacing, design and sizing will comply with the relevant clauses of AS 2419.1:2021; an additional three hydrants are to be installed on the western side of the proposed subdivision.
	Hydrants are not located within any road carriageway; and	Hydrants are not to be located within any road carriageway.

Performance Criteria	Acceptable Solutions	Assessment
The water supply is accessible and reliable for firefighting operations.	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	As the development is constrained by existing dwellings no perimeter roads are proposed, thus no ring system is installed.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.	Fire hydrant flows and pressures are to comply with the relevant clauses of AS 2419.1:2021.
The integrity of the water supply is maintained.	All above-ground water service pipes external to the building are metal, including and up to any taps.	All 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 fire fighting purposes in areas where reticulated water is not available.	Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d;	N/A – development is serviced by reticulated water.
Electricity Services		
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground;	It is proposed that all electrical transmission lines will be installed underground.
Gas Services		
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	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;	N/A - No gas connections are proposed within the development.
	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.	

Performance Criteria	Acceptable Solutions	Assessment
Construction Standards		
The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with PBP Tables A1.12.5. Construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).	The newly proposed structures are to be built according to the BAL constructions requirements shown in Figure 5 .
Proposed fences and gates are designed to minimise the spread of bush fire.	Fencing and gates are constructed in accordance with PBP section 7.6.	Fencing and gates within 6m of structures or within BAL 29 areas are to be built of non-combustible material.
Proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.	Any Class 10a building built within 6m of a residential structure is to be built to the same BAL rating as the residential structure.
Home-based child care: the proposed building can withstand bush fire attack in the form of wind, localised smoke, embers and expected levels of radiant heat.	APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure; and The existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.	N/A – no home-based childcare is proposed.
Landscaping		
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);	Landscaping plan complies with the NSW RFS 'Asset protection zone standards' (PBP 2019 Appendix 4).
	A clear area of low-cut lawn or pavement is maintained adjacent to the house;	Landscaping is to be kept away from residential structures to a distance of 1m.
	Fencing is constructed in accordance with section 7.6; and	Fences in BAL 29 areas or within 6m of a residential structure are to be built of non-combustible materials.

Performance Criteria	Acceptable Solutions	Assessment
	Trees and shrubs are located so that: the branches will not overhang the roof; the tree canopy is not continuous; and any proposed windbreak is located on the elevation from which fires are likely to approach.	There are to be no branches or trees overhanging structures, tree canopy is to have breaks of 2-5m minimum.
Emergency Management		
a Bush Fire Emergency Management and Evacuation Plan is prepared.	Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; NSW RFS Schools Program Guide; Australian Standard AS 3745:2010 Planning for emergencies in facilities; and Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable). the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants. Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	While not specific to all infill developments it is recommended that a Bush Fire Emergency Management and Evacuation Plan be prepared for this development to ensure that evacuation planning is undertaken and, where required, help is provided to leave in the case of a bushfire emergency.

Table 4 – Assessment for existing dwelling under Section 8.2.1

Performance Criteria	Assessment
APZs based on radiant heat threshold of 29kW/m ²	The location of the new dwellings are all located in areas that would have a radiant heat threshold of 29kW/m ² or less. However, the location of some of the existing dwellings cannot conform to a radiant heat threshold of 29kW/m ² or apply additional APZs, given the remnant bushland located to the north of the development.
Construction provisions	Given the location of the existing dwellings it is recommended that the dwellings in the north of the development are upgraded to improve ember protection where this is not already in place. This can be achieved by enclosing all openings or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable this would include any subfloor areas,

Performance Criteria	Assessment
	openable windows, vents, weepholes and eaves. External doors should be fitted with draft excluders. This will result in a better bushfire outcome than if the development were not to proceed.
Improved Water availability	Two additional hydrants are to be installed on the western side of the development between the hazard vegetation and new structures providing increased water access and fire fighting ability in these areas than is currently available. Water pressures are to be examined against the Australian Standard as a condition of consent and, where found lacking, upgraded as part of the development.
Access, Egress and evacuation	Access to all dwellings is provided by internal roads as outlined in Table 3. The development will improve the current ability to move within and egress from the site with upgrades to roads and an additional egress point maintained in the southwest. A Bushfire Emergency Management Plan is recommended as part of the conditions of consent. The BEMP details actions to be taken in the case of a bushfire including evacuation triggers, sheltering locations and actions to be taken on a community scale to prepare for a bushfire. The BEMP is to also outline community involvement with Bushfire Emergency Management planning and implementation.

5.0 Bushfire Hazard Determination

5.1 Construction Standards – AS 3959-2018

As outlined above, the identification of proximate hazards post development has resulted in the need for an APZ, and hence consideration of related construction standards. APZs are not wholly achievable in the proposed development. The proposed development will conform to the Australian Standard 3959-2018 Construction of buildings in bushfire prone areas and will be built to appropriate BAL construction standards, with the provision of defendable space against the hazard.

The Australian Standard 3959-2018 Construction of buildings in bushfire prone areas, details six (6) levels of construction standards that are required for buildings, depending upon the expected impact of a bushfire from adjacent areas. These Bushfire Attack Levels (BALs) are measured from the edge of the hazard and incorporate vegetation type and slopes (see above) to determine the relevant distance for each BAL rating (and associated construction standard).

The relationship between the expected impact of a bushfire and the BAL rating is provided in **Table 5** below.

Table 5 – BAL Construction Standard

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction standard under AS 3959-2021
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	BAL - 29
40	29 to 40	BAL – 40
Flame Zone	≥40	BAL – FZ (Not deemed to satisfy provisions)

The BAL construction standards that apply to the proposed new dwellings is listed below.

TH26 - TH33 are to be built to **BAL - 19** standards as a minimum.

Any new external works on Ex Cabin 1 and Ex Cabin 2 as part of renovations are to meet **BAL 19** standards.

All other Ex Cabins being renovated and new town houses should be constructed to meet a minimum **BAL 12.5** standard.

Figure 5 depicts the BAL construction standards applicable for the proposed development.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Subject Site
-  Approved 50m APZ
-  Internal APZ (not met for existing dwellings)

Required Bushfire Attack Levels

-  BAL - 12.5
-  BAL - 19
-  BAL - 29
-  BAL - 40
-  BAL - FZ



1. Boundaries are not survey accurate
2. Do not scale off this plan



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Figure 5 - Required Bushfire Attack Levels

Date: Sept 2024

Location: 4 Fleet St, Salamnader Bay, NSW

Client: Wanda Beach Estate Pty Ltd

AEP Ref: 5075

6.0 Other Considerations

The following analysis applied to the Subject Site in reference to environmental features present.

Table 6 – Other Site Constraints

Item	Comments
Riparian Corridors	There are no riparian corridors within the Subject Site or Study Area
State Environmental Planning Policy (Resilience and Hazards) 2021	No Coastal Wetlands or Littoral Rainforest are located within the Subject Site. The vegetation to the north is mapped Littoral rainforest and part of the site is mapped as a Proximity Area for Littoral Rainforest.
State Environmental Planning Policy (Biodiversity Conservation) 2021	The proposed development does not involve removal of any native vegetation. Thus, it is considered that no aspect of the SEPP is triggered.
Areas of geological interest	None present
Environmental protection zones or steep lands (>18°)	None present within the Subject Site or surrounds
Land slip or flood prone areas	None present
National Parks estate or various other reserves	None present within the Subject Site
Threatened species matters	As there is no native vegetation removal it is considered unlikely that threatened species would be impacted.
Aboriginal Heritage	None known to be present within the Subject Site

7.0 Conclusion

Investigations undertaken for this Bushfire Threat Assessment report have revealed that the proposed infill development will be affected by hazard vegetation to the north, north east, north west, west and south west of the Subject Site.

The location of the Subject Site is in an existing residential area with required APZs unable to be achieved within the property boundaries. An approved and established APZ is present to the west of the development under the control of the owner of the proposed development. New dwellings are located outside of the required APZ and these dwellings are to be built to conform to the Australian Standard 3959-2018 '*Construction of buildings in bushfire prone areas*' as outlined in this report in Section 5.1 and shown in **Figure 5**.

External works on renovated Ex Cabins are to also meet the required BAL construction standards as outlined in Section 5.1 of this report.

Existing structures within BAL – FZ and BAL – 40 areas are to be retrofitted with BAL – 40 or higher rated bushfire shutters on the northern glazing at a minimum and ember protection while other existing structures outside of the BAL – FZ and BAL – 40 areas are to be retrofitted with ember protection.

Access is provided off Fleet St onto internal roads, there are three main internal roads, northern, middle and southern. The northern road, which is a continuation of Ridgeview Road, has a turning area that allows for RFS vehicle to turn around quickly. The southern road, Anchor Cove, has a dead end with a gate that can provide emergency access out onto Fleet St. The middle road (Angel Close) is a dead-end road that has a turning head provided along with signage posted at the entrance to this road identifying that it is a dead-end road.

Emergency access to the western side of the development can also be achieved by registered fire trails through the vegetation to the west. It is considered that the proposed access and egress arrangements are appropriate given the constraints of the site for firefighting logistics. Evacuation logistics and safe haven are to be identified within the Bushfire Emergency Management Plan.

The existing reticulated water supply system will be tested as part of the development and upgraded if required to ensure it is fit to service the proposed infill development in accordance with AS2419.1 – 2021. Two additional hydrants are proposed on the western side to provide for water supply and fire fighting capabilities in the APZ to the west if fire fighters cannot access the existing fire trails.

When applied, these measures should provide adequate protection to life and property within the proposed development in the event of a bushfire occurring in the immediate locality. Despite all these measures it can never be guaranteed that the site and residents and structures will not at some stage be affected by a bushfire event.

8.0 References

NSW Government (1979). *Environmental Planning & Assessment Act 1979*. NSW Government. Sydney.

NSW Government (2021). *Planning Portal*. www.planningportal.nsw.gov.au. Accessed April 2022.

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Standards Australia (2021). *AS-2419.1 Fire Hydrant System Design, Installation and Commissioning*. Council of Standards Australia, 2021.

Appendix A – Study Area Photos



Above: Approved 50m APZ provided to the west of the proposed development.

Below: Caravan Park located to the South of the proposed development.





Above: Small corridor of Littoral Rainforest vegetation to the north looking across the old tennis court and existing dwelling.

Below: Residential dwellings located to the east of the proposed development





Above: Current dilapidated dwellings located in the southwest of the site.

Below: Access from Anchor Cove to Fleet street to be upgraded.





Above: Southern road (Angel Close) looking east

Below: Current entry roads looking east towards upgraded roads and renovated cabins.





Above: Proposed location of turnaround point at middle of APZ on western side of the site.

Below: Current firetrail access to the west of the site.





Above: Sharp bend for firetrail access – proposal would offer a straight entry onto firetrail

Below: Current firetrail access to northern section of the site.





Above: Current Firetrail access up to middle of the site

Below: Current landscaping within the development and dilapidated buildings that would be renovated as part of the proposal leading to better bushfire outcomes.

