

Bush Fire Assessment Report

Proposed:
Gosford Alive

At:
Gosford CBD NSW

Reference Number: 191032

Prepared For:
Lederer Group

4th September 2019



Prepared By:
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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Central Coast 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 – 2006
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to the Master Plan & Stage 1 approval for the construction of five (5) residential apartment buildings, car parking and associated works over two existing allotments known as 136-148 Donnison Street, Gosford (Lot 6 DP 598833 & Lot 1 DP 540292).

Central Coast Council's Bushfire Prone Land Map identifies the subject property as partially containing the 100 metre buffer zone from designated Category 1 Vegetation and therefore the application of Planning for Bush Fire Protection – 2006 (PBP) must apply in this instance.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide the Lederer Group 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 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 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2013, the RFS document known as 'Planning for Bush Fire Protection – 2006' for the purposes of bushfire hazard determination and Australian Standard AS3959 – 2009 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

Several company representatives have undertaken a site inspection of the subject property and the surrounding area. The Stage 1 Masterplan prepared by Buchan (ref 218255 / August 2019) has also been reviewed and relied upon for this report.

5.0 Legislative context

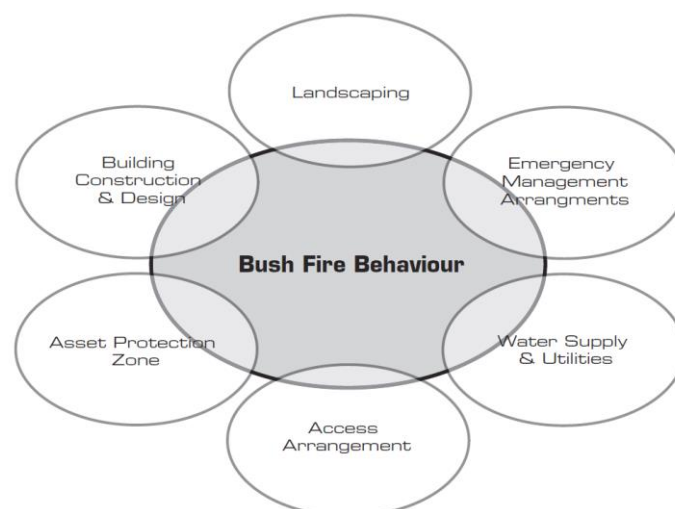
Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bush Fire Protection - 2006' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2009 'Construction of buildings in bushfire prone areas'.

Planning for Bush Fire Protection – 2006, (PBP) formally adopted on the 1st March 2007 and amended 3rd May 2010 (Appendix 3) provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development containing Category 1, 2 or 3 Vegetation and also inside a buffer zone radius of 100m from a Category 1 Vegetation or 30m buffer zone from a Category 2 or 3 Vegetation.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject development relates to the construction of five (5) residential apartment buildings, car parking and all associated infrastructure within two existing allotments. To accord with PBP the proposal is considered infill development under section 4.14 of the Environmental Planning and Assessment Act 1979, however as it relates to an increase density it has been assessed as if it is a residential subdivision.



6.0 Bushfire Assessment

6.01 Proposal

The development proposal relates to the approval of five (5) residential tower buildings, parking and associated infrastructure.

The subject site is zoned B4 – Mixed Use and comprises of two (2) existing allotments being;

136 – 146 Donnison Street
148 Donnison Street

Lot 6 DP 598833
Lot 1 DP 540292

6.02 Location

The subject site is bounded by Henry Parry Drive to the west, William Street to the north, Donnison Street to the south and Albany Street to the east. The southeastern corner of the site contains the 100 metre buffer zone from designated Category 1 Vegetation (refer to Image 03).

The vegetation identified as posing a bushfire hazard to the proposed development is within a fragment of Rumbalara Reserve to the southeast, beyond Donnison Street, and has no direct connectivity to the larger bushfire hazard within Rumbalara Reserve proper further east.



Image 01: Aerial image of the subject area (courtesy Nearmap.com)

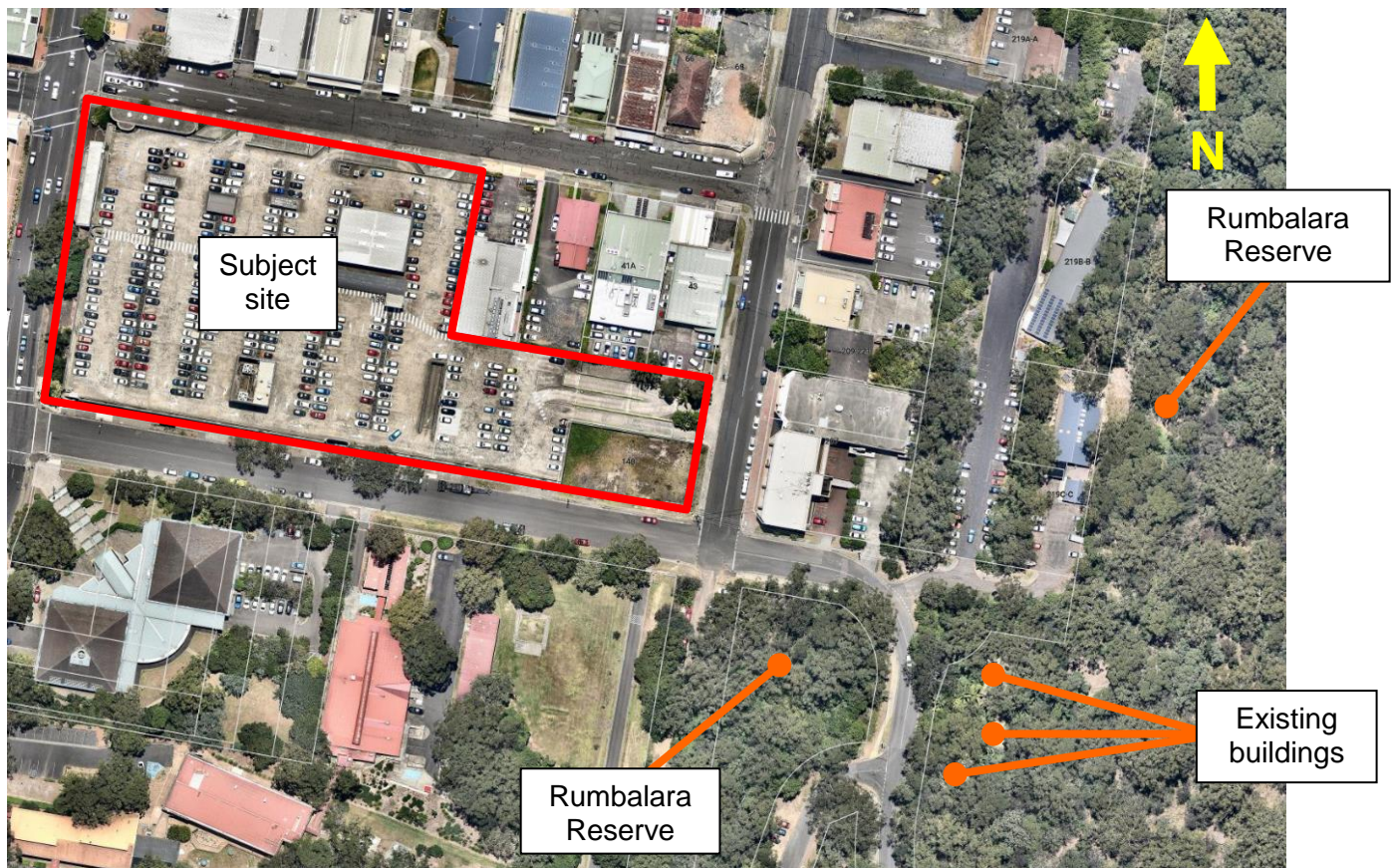


Image 02: Aerial image of the subject area (courtesy Nearmap.com)

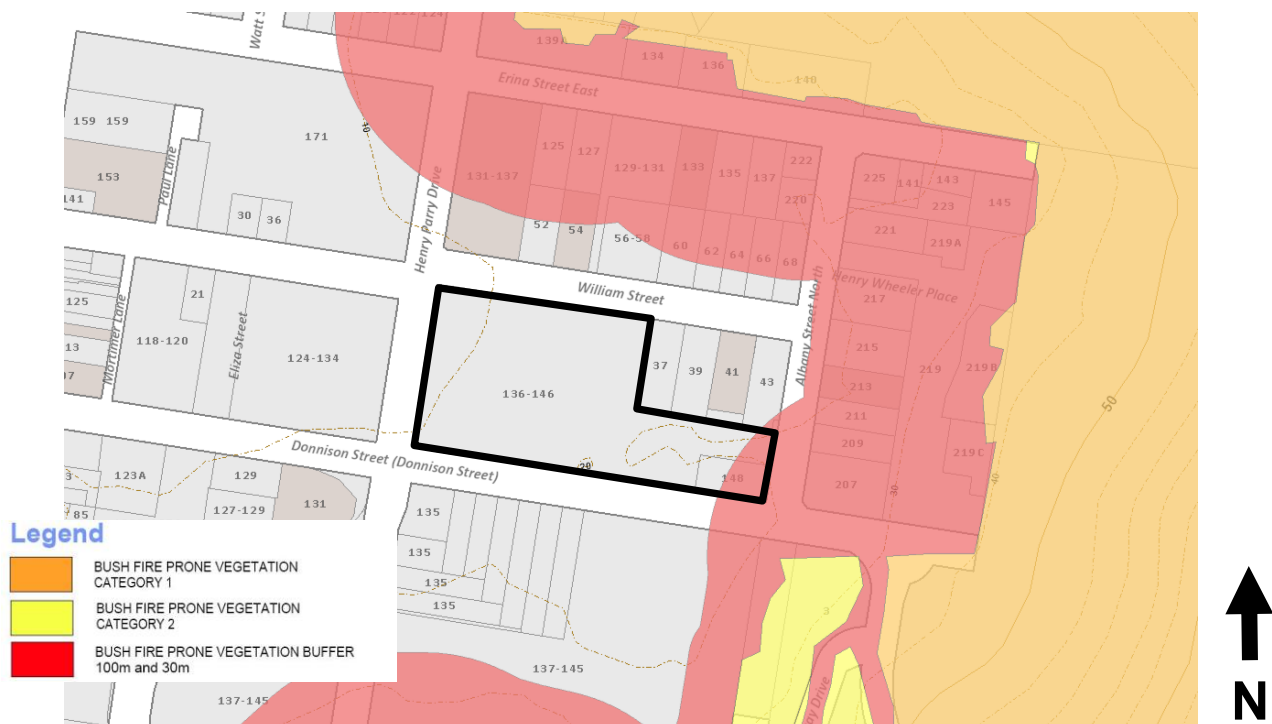


Image 03: Excerpt from Central Coast Council Electronic Mapping System © 2018
Bushfire Prone Land Map

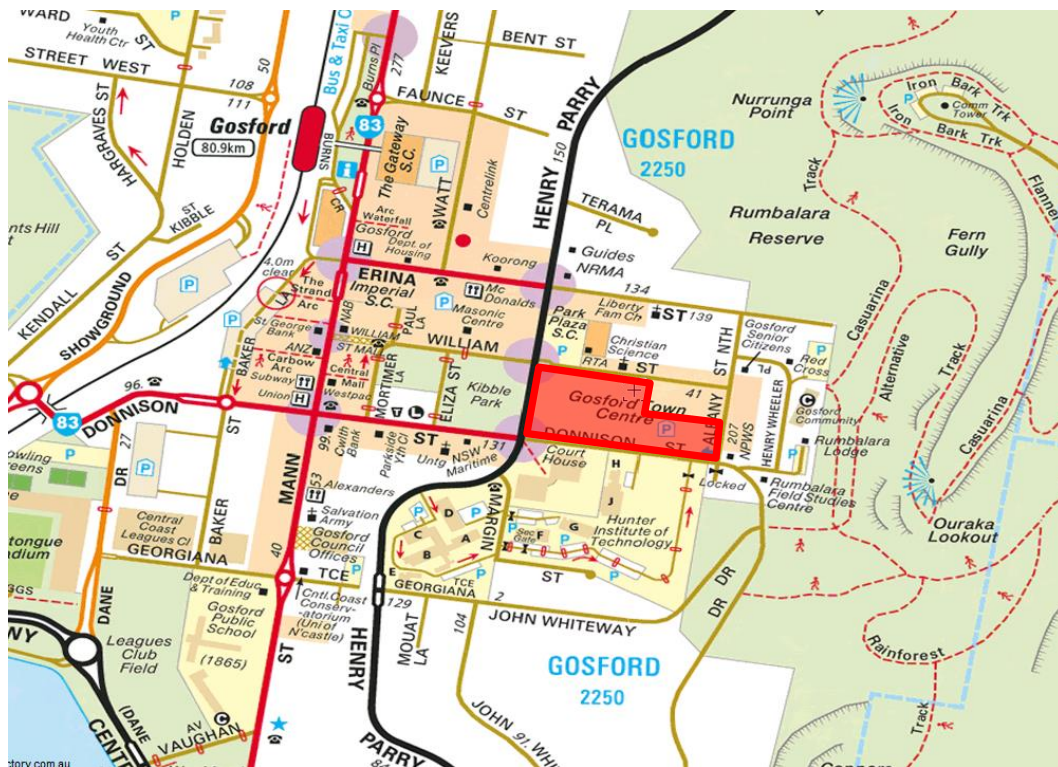


Image 04: Excerpt from Street-directory.com.au

6.03 Vegetation

The vegetation identified as being the hazard is within a small fragment of Rumbalara Reserve to the southeast and Rumbalara Reserve proper to the east. The vegetation posing a hazard to the southeast and east was found to consist of trees 15 - 20 metres in height with a 30 - 50% foliage cover and an understorey of herbs, ferns, shrubs and some weed varieties.

The vegetation to the southeast within the Reserve between the Albany Street road reserve and John Whiteway Drive posed marginally greater than a 50 metre fire run from the east, and due south where the fire run and fire development period is longer the fire development would be insipient due to the size of the vegetation due south being less than 1 hectare in size. Two roads and several buildings fragment the hazard and separate it from the fully structured forest within Rumbalara Reserve proper further to the east.

While in our opinion this fragmented area does not have the fuel loading of a true forest hazard and is a shape and size that could be considered a remnant hazard, we also consider that given the scale of the development the potential, however small, for a fire front emanating from Rumbalara Reserve and impacting westward across John Whiteway Drive must be considered.

We have therefore used a forest structure as a margin of safety to ascertain the minimum required Asset Protection Zones and subsequent Bushfire Attack Levels from this aspect. In considering this scenario we have however adopted a 50 metre vegetation width / fire front to reflect the actual exposed interface. Furthermore the slope from west to east within the hazard (being the slope any fire impacting across John Whiteway Drive would traverse) has been used in the assessment.



Photograph 01: View southeast at the intersection of Donnison Street and Albany Street of the hazard interface

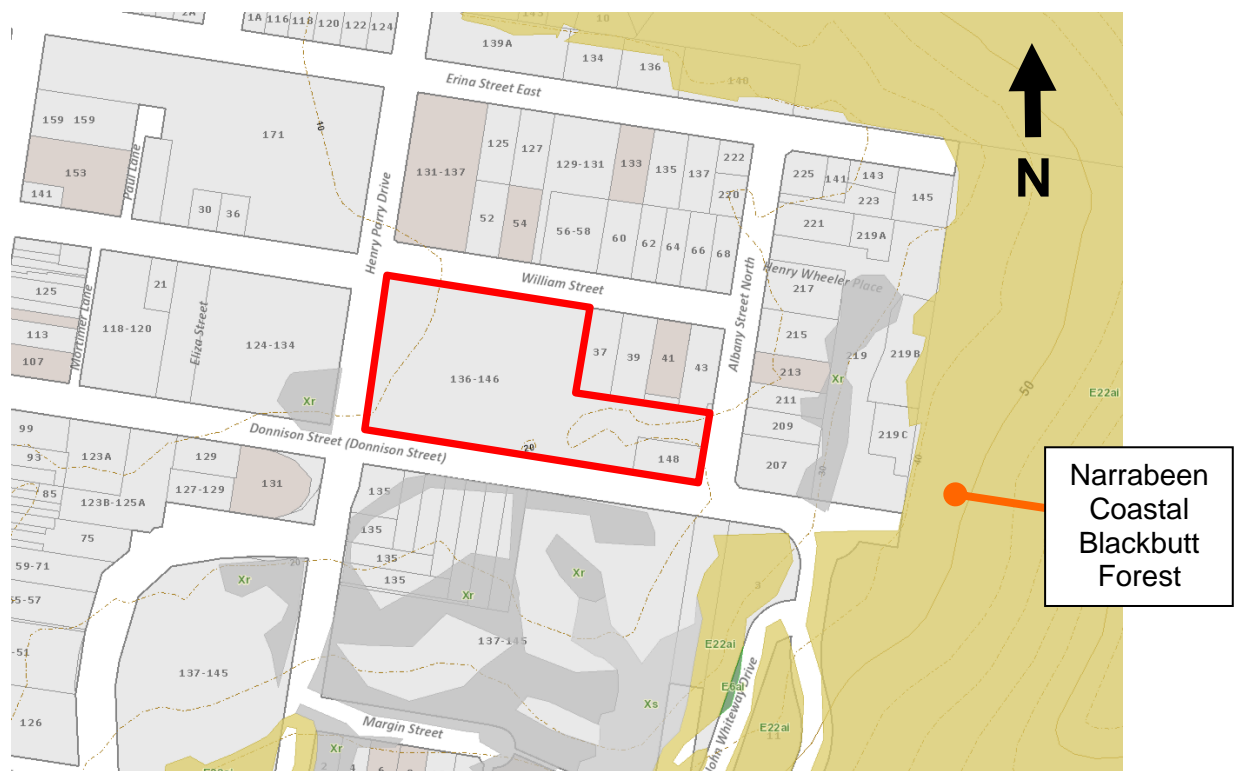


Image 05: Excerpt from Central Coast Council Electronic Mapping System © 2018 BELLS Vegetation

6.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour within the hazard must be assessed for at least 100 metres from the proposed building footprint. The slope was measured onsite using an inclinometer and verified from topographic imagery of the area.

It should be noted that the fire run directly from the south within the hazard would be considered a remnant (< 1 ha) and as previously discussed a higher threat being from a forest to the east has been considered. Therefore the slope within the hazard directly away from the proposed development and toward Rumbalara Reserve to the east has been applied.

The slope that would **most significantly** influence bushfire impact was determined to be:

- 12.9 degrees upslope within the hazard to the southeast

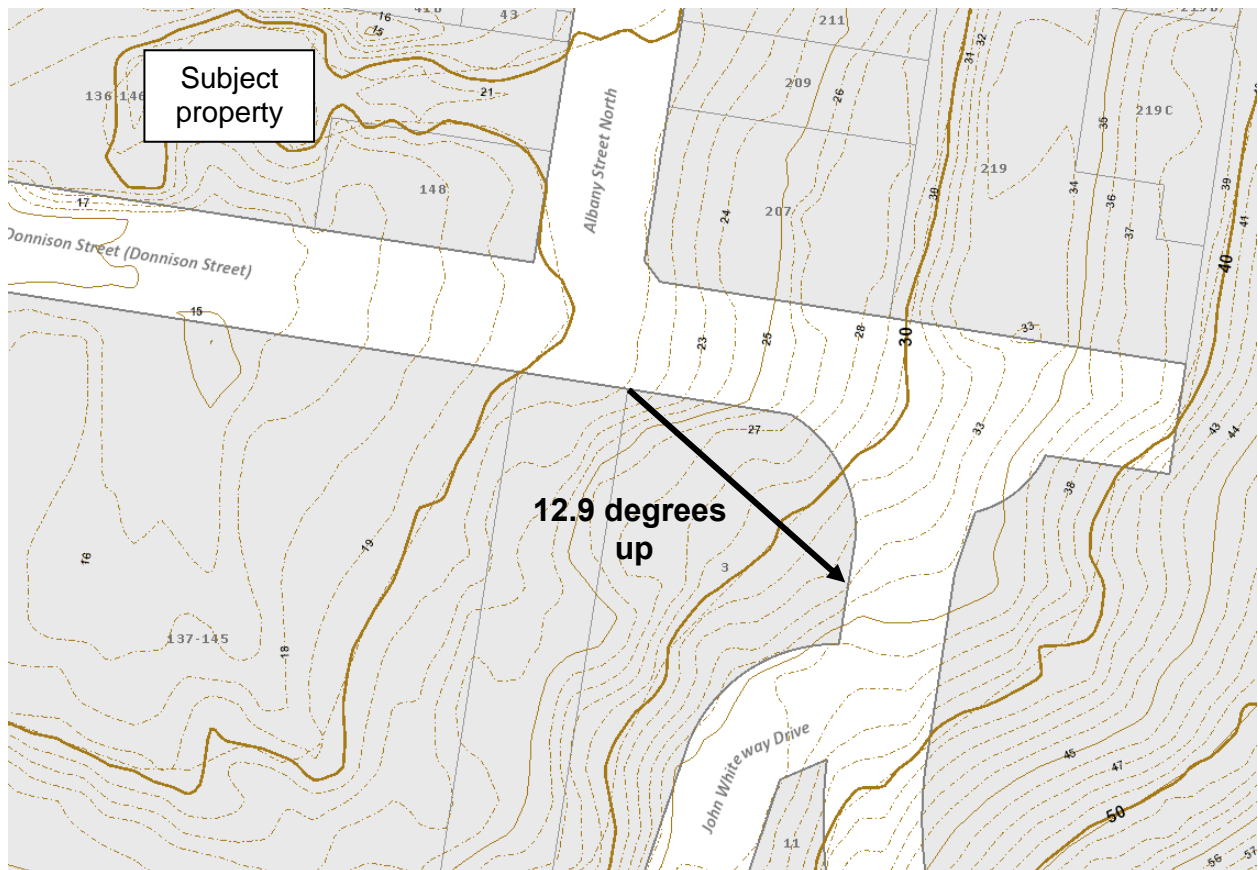


Image 06: Extract from Central Coast Councils Electronic Mapping System 2016

6.05 Asset Protection Zones

The development proposal includes an increase in density and therefore in accordance with Planning for Bush Fire Protection 2006 minimum required Asset Protection Zones for residential subdivisions must be applied to the proposed residential apartment blocks.

The minimum required Asset Protection Zones were determined from Table A2.4 of PBP to be 20 metres.

The proposed Asset Protection Zones are:

- 180 metres to tower 1
- 160 metres to tower 2
- 133 metres to tower 3
- 96 metres to tower 4
- 37 metres to tower 5

The proposal exceeds the minimum required Asset Protection Zones as determined from Appendix 2 of Planning for Bush Fire Protection 2006.

All Asset Protection Zones within the subject property will be maintained in accordance with the NSW Rural Fire Service's document 'Standards for Asset Protection Zones'. This will allow for gardens (including native trees and shrubs) in the APZ managed as clumps or islands, covering of no more than 20% of the area.



Subject
property

Photograph 02: View northwest from Donnison Street toward the subject site of the existing external APZ

6.06 Fire Fighting Water Supply

The proposed buildings will be connected to the reticulated town's water mains for their domestic and commercial needs. Existing in ground hydrants are available along Henry Parry Drive, Donnison Street, William Street, Albany Street, John Whiteway Drive and surrounding streets for the replenishment of attending fire services.

The proposed development will include any necessary upgrades to the water main into the subject site to supply new hydrant systems, hose reels and internal sprinkler systems. The sizing, spacing and pressures of the hydrant system must comply with AS2419.1-2005.

The existing and proposed water supply is considered adequate for the replenishment of attending fire services.

6.07 Property Access – Fire Services & Evacuation

The subject site has street frontage to Henry Parry Drive to the west, William Street to the north, Donnison Street to the south and Albany Street to the east. Access to all buildings is via underground car parking and there are no internal roads proposed as part of this development.

The proposal will also include a shareway between William Street and Donnison Street. This shareway will provide a 6 metre carriageway.

The surrounding public road infrastructure was found to exceed the carriageway requirements for Public Roads as detailed in section 4.1.3(1) of Planning for Bush Fire Protection 2006.

Persons seeking to egress the proposed towers are able to do so via the existing road infrastructure away from the hazard interface.

Fire services have free pedestrian access around the proposed building footprints. Attending fire crews can access the bushfire hazard via John Whiteway Drive for hazard reduction or fire suppression activities without the need to enter the subject site.

NSW Fire & Rescue are the combat agency for bushfires and property protection in this locality and they will be assisted by the NSW Rural Fire Service as needs be.

We are of the opinion that the existing and proposed access arrangements are suitable for fire service access and occupant evacuation.

6.08 Viable Construction Method

The objectives of Planning for Bush Fire Protection – 2006 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2006 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009. Regardless new development of this scale within the Flame Zone would not be supported.

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2009
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 proposed tower 5 was determined from bushfire design modelling (report attached) consistent with Method B of AS3959 – 2009 to be 'BAL 12.5'.

The highest Bushfire Attack Level to proposed tower 4 was determined from Table 2.4.2 of AS3959 – 2009 to be 'BAL 12.5'.

Proposed towers 4 & 5 are therefore required to comply with BAL 12.5 under section 3 and section 5 of AS3959 – 2009 and the additional construction requirements detailed in the addendum to Appendix 3 of PBP.

All other proposed towers (1-3) are located greater than 100 metres from the hazard interface and as such incur a BAL Low determination. There are no bushfire specific construction requirements for towers 1-3.

7.0 Broader Bushfire Considerations

This section will discuss the bushfire risk posed to the subject development and resilience of the proposed buildings to the mechanisms of bushfire impact, evacuation and emergency management.

In assessing the bushfire threat to the site and its structures it is important to have a holistic approach and assess the risk of a bushfire occurring and impacting the subject property. It is also important to include the risk the site poses to neighbouring properties.

The nearest bushfire hazard (Rumbalara Reserve) is located to the east of the site with another hazard (Presidents Hill Lookout) located almost 300 metres to the west. Traditionally bushfires are at their worst on hot dry days and these are usually associated with hot airflow from inland Australia to the west and supported by north westerly breezes. Any fire occurring within Rumbalara Reserve under these conditions would be directed east away from these sites towards the coast.

The previous bushfire history of an area gives an assessor an indication into the frequency of fire occurrence which subsequently allows the likelihood of a fire occurring to be determined. Previous fire history can include prescribed burns or hazard reductions and wildfires or unplanned fires.

At the time of inspection there were no physical signs (i.e. charring or regrowth) of previous bushfires in the south-eastern and eastern hazards in this vicinity. We have found fire history mapping for the area indicates the only recorded wildfires to the east within Rumbalara Reserve occurred in 2001/02.

The traditional fire path could allow for potential spotting within the subject area from fires within Presidents Hill Lookout, however it is important to note that under this north/north-westerly fire path which is heavily influenced by prevailing weather conditions (i.e. winds) fire development and progression from within the south-eastern hazard (being the closest) would be encouraged away from the subject development.

8.0 Community Resilience Practice Note 2/12

The NSW RFS have also released a document **Community Resilience Practice Note 2/12 Planning Instruments and Policies** which identifies additional heads of consideration for high rise high density development.

- Location – high-rise buildings should not be located along ridges or along slopes with significant fire runs:

The development is located on the flat in a valley between two ridgetops.

- Existing infrastructure – when highrise developments are proposed their impact during potential bush fire emergencies needs to be considered, particularly in terms of evacuating occupants along the road network and the availability of water supplies available for high-rise fire fighting:

Given that towers 4 & 5 are within an area determined to be BAL 12.5 and all other buildings are within an area determined to be BAL Low no late emergency relocation of occupants would be considered necessary or appropriate. Early (orderly) relocation before a bushfire event or safe refuge onsite would be the best options for any bushfire emergency management plans for this development.

Similarly persons in the retail sections or visiting the site could also take safe refuge onsite should the need arise, with areas onsite meeting the setback criteria for neighbourhood safer places. Alternatively persons seeking to egress the proposed towers are able to do so via the existing road infrastructure away from the hazard interface.

Regardless the surrounding public road infrastructure was found to exceed the carriageway requirements for Public Roads as detailed in section 4.1.3(1) of Planning for Bush Fire Protection 2006.

Attending fire crews can access the hazard for hazard reduction or fire suppression activities without the need to neither enter the subject site nor cross paths with avenues of access and egress to the proposed development.

The proposed development will include any necessary upgrades to the water main into the subject site to supply new hydrants system, hose reels and internal sprinkler systems. The sizing, spacing and pressures of the hydrant system must comply with AS2419.1-2005.

The existing and proposed water supply is considered adequate for the replenishment of attending fire services.

- External facades – external facades may result in increased exposure to radiant heat and also convection columns. Specialised modelling may be needed and APZs may need to be increased over and above those specified to account for this:

The National Construction Code 2019 (formally Building Code of Australia) objective in relation to construction in bushfire prone areas is to safeguard occupants from injury and protect buildings. This can be achieved with compliance to the relevant Bushfire Attack Level under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

The highest Bushfire Attack Level to the development (towers 4 & 5) was determined to be BAL 12.5. Proposed towers 4 & 5 can satisfy the requirements for BAL 12.5 as described in section 3 and 5 of AS3959 – 2009. The highest radiant heat impact was determined to be 5.18 kW/m² at a peak elevation of receiver of 3.34 metres. Most parts of the development (towers 1-3) are within an area determined to be BAL Low.

Further to compliance with AS3959 the proposed development will be constructed to a higher standard as it relates to a high rise development. Of note is:

Concrete floor and roof slabs;

Concrete or masonry external walls and concrete or masonry internal walls between units;

The buildings will have internal fire separation (compartmentalisation) and even if one or more units are compromised there will remain safe refuges inside the units until the bushfire passes and the outside area becomes tenable;

The tower buildings will have an internal sprinkler system;

The buildings will be constructed to Type A construction (National Construction Code 2019).

- Potential for entrapment - the risk associated with occupant egress is higher in high-rise buildings than for lower-rise structures and therefore the potential for entrapment during a bushfire emergency should be addressed.

The term evacuation often infers the rapid movement of persons in times of a direct emergency where little time is available. In terms of bushfire emergencies this action is against all current teachings and policies. Where we refer to evacuation within this dialogue we draw a distinction between the coordinated relocation of residents by emergency services (evacuation) and rushed late and last minute movement of people during or at times of imminent bushfire impact (late evacuation). The term relocation of occupants occurs where there is adequate time to calmly prepare and remove occupants to predetermined safer locations.

Considerable review and critique has been documented on human behaviour, fire service response, evacuation attempts, and the “Stay or Go” policy over many years and by many agencies. Most recently these matters have been significantly reviewed during and following the Royal Commission into Victoria’s 2009 bushfires. Without oversimplifying our research and these detailed reports the general thread is that last minute *late evacuation* is dangerous, not recommended, and not the promoted policy or procedure of fire authorities.

The 2009 Victorian Bushfires Royal Commission Interim Report found:

“last-minute evacuation is dangerous; it is better for people to remain with adequately prepared homes than to be relocated; and large-scale evacuations are problematic”

The Australasian Fire and Emergency Service Authorities Council (AFAC) is the industry body for fire, land management and emergency service organisations in Australia and New Zealand. Their membership includes the NSW Rural Fire Service.

The 2010 AFAC Position on Bushfires and Community Safety paper expresses AFAC’s position on the safety and protection of people and community assets from bushfires, providing guidance on good practice for managing community safety and increasing resilience.

This position is based on emergency risk management principles and available evidence and experience, including the findings of a number of public enquiries and research, and may change following further research into bushfires. Recently, the findings of the Victorian Bushfires Royal Commission have influenced this position.

The AFAC position is that people have two options, leaving early or staying and defending. Their position is that leaving early is always the safest option. Their advice to emergency organisations is that people living in bushfire prone areas should make their own decisions on how they will respond to a bushfire emergency.

They advise that large scale evacuation is not the default option, although on days where the Fire Danger Index (FDI) approaches 100 it may be the safest option and fire agencies may recommend evacuation of all those present before fires even occur, acknowledging that last minute relocation or evacuation is dangerous and planned orderly evacuation well ahead of the fire is always preferred.

In relation to the evacuation of the occupants it is important to note that this development has the ability to educate its occupants through the provision of a Bushfire Emergency Management Plan, which would complement the NSW Rural Fire Service policy of 'Leave Early or Stay and Defend'. This would also compliment the ongoing public education and awareness campaign undertaken by both the NSW RFS and NSW Fire and Rescue.

Given the significance of appropriate evacuation it would not be unreasonable to include in consent conditions a requirement for a Bushfire Emergency Management Plan to be provided for any building within 100 metres of a bushfire hazard.

A Bush Fire Evacuation Plan would be expected to include the following:

- (1) under what circumstances will the building be evacuated.
- (2) where will all persons be evacuated to.
- (3) roles and responsibilities of persons coordinating the evacuation.
- (4) roles and responsibilities of persons remaining with the building after evacuation.
- (5) a procedure to contact the NSW Rural Fire Service District Office and NSW Fire & Rescue and inform them of the evacuation and where they will be evacuated to.

This plan would be established prior to occupancy and would reflect the NSW Rural Fire Service policy of 'Leave Early or Stay and Defend'. As this development will form a body corporate, reliance on the implementation and revision of this plan can be seen as being better than that of a residential subdivision or sole occupancy dwelling. This is because it can be formally controlled by the body corporate and could involve the establishment of a separate subcommittee for bushfire matters if necessary.

Emergency management planning for the Gosford area is the responsibility of Central Coast Councils Local Emergency Management Officer (LEMO) under the provisions of the Local Government Act. Any relocation or evacuation will be undertaken with the coordination/communication of the LEMO and Incident Management Team including consultation with the NSW RFS at that time.

Given the low risk aspect and low radiant heat expected to this development it is unlikely that on days of Catastrophic fire weather days the RFS or Fire and Rescue NSW would recommend the early and orderly relocation of all residents from the development site. It would be almost impossible (and unnecessary) for fire services to coordinate a timely mass relocation, rather occupants would be encouraged to stay within the building as the bushfire front impacts. The risk of entrapment of occupants isn't a consideration that needs any additional recommendations to address.

In summary it is of our opinion that the proposed development not only satisfies the technical requirements of Planning for Bush Fire Protection 2006 but also satisfactorily addresses the broader issues raised by the RFS relating to residential high rise development within bushfire prone areas.

In favour of this development application I note that;

- The building will be constructed to the bushfire requirements specified within the NCC 2019 and AS 3959 – 2009.
- Onsite access, services and local water supply can comply with the requirements of Planning for Bush Fire Protection 2006.
- The buildings will have internal fire separation (compartmentalisation) and even if one or more units are compromised there will remain safe refuges inside the units until the bushfire fire passes and the outside area becomes tenable.
- Strata managed development has advantages over sole occupancy subdivision in that occupants can be regularly informed and educated, Bushfire Emergency Management Plans can be enforced and regularly reviewed and the grounds/landscaping management can be formalised by a plan of management including regular inspections for compliance with Asset Protection Zone requirements.
- The tower buildings will have an internal sprinkler system.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2006 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' - 2009. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

General / Master Plan

1. That the layout, access provisions and building footprints comply with the Stage 1 Masterplan prepared by Buchan (ref 218255 / August 2019).

Asset Protection Zones

2. That all grounds not built upon within the subject site east of Tower 4 be maintained as an Asset Protection Zone as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 2 of Planning for Bush Fire Protection 2006.

Construction Towers 4 & 5

3. That Towers 4 & 5 are to comply with section 5 (BAL 12.5) Australian Standard AS3959-2009 "Construction of buildings in bush fire-prone areas" and section A3.7 Addendum Appendix 3 of "Planning for Bush Fire Protection".

Emergency Management Plan

4. That a Bushfire Emergency/Evacuation Plan is to be prepared for Towers 4 & 5 in accordance with the NSW Rural Fire Service Guidelines for the Preparation of Emergency/Evacuation Plan and comply with Australian Standard AS 3745 - 2010 'Emergency Control Organisation and Procedures for Buildings Structures and Workplaces for Residential Accommodation'.

Water Supply

5. That the sizing, spacing and pressure of the proposed hydrant system is to comply with AS2419.1-2005.

10.0 Conclusion

Given that the property is deemed bushfire prone under Central Coast Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2006 and of the construction requirements of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' – 2009.

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 Master Plan & Stage 1 approval for the construction of five (5) residential apartment buildings, car parking and associated works over two existing allotments known as 136-148 Donnison Street, Gosford (Lot 6 DP 598833 & Lot 1 DP 540292).

The proposed development exceeds the minimum required Asset Protection Zones as detailed in Appendix 2 of Planning for Bush Fire Protection 2006 for the residential development.

The proposed water supply and access provisions are considered adequate.

In accordance with the bushfire safety measures contained in this report, and in 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.

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11.0 Annexure 01

List of Referenced Documents

- a) Environmental Planning and Assessment Act - 1979
- b) Rural Fires Act 1997 as amended
- c) 'Planning for Bush Fire Protection'- 2006 - NSW Rural Fire Services & Planning NSW
- d) 'Construction of buildings in bushfire-prone areas' - AS 3959 – 2009 (as - amended) – Standards Australia
- e) 'Central Coast (formally Gosford) Council's Bushfire Prone Land Map'
- f) Stage 1 Masterplan prepared by Buchan (ref 218255 / August 2019)
- g) Acknowledgements to:
NSW Department of Lands – SixViewer
Street-directory.com.au
Central Coast Council's Electronic Mapping

Attachments

- Attachment 01: Bushfire Design Modelling (Tower 5)
- Attachment 02: s4.14 Compliance Certificate



NBC Bushfire Attack Assessment Report V2.1

AS3959 (2009) Appendix B - Detailed Method 2

Print Date: 5/09/2019

Assessment Date: 15/05/2019

Site Street Address: 136-148 Donnison Street, Gosford

Assessor: Stuart McMonnies; Building Code & Bushfire Hazard Solutions Pty Ltd

Local Government Area: Gosford

Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001

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: Forest

Vegetation Group: Forest and Woodland

Vegetation Slope: 12.9 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 20

Overall Fuel Load(t/ha): 25

Site Information

Site Slope 2 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 37

Fire Inputs

Veg./Flame Width(m): 50

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

Category of Attack: LOW

Peak Elevation of Receiver(m): 3.34

Level of Construction: BAL 12.5

Fire Intensity(kW/m): 12729

Radiant Heat(kW/m2): 5.18

Flame Angle (degrees): 80

Flame Length(m): 9.41

Maximum View Factor: 0.086

Rate Of Spread (km/h): 0.99

Inner Protection Area(m): 37

Transmissivity: 0.791

Outer Protection Area(m): 0



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:	136-148 Donnison Street, Gosford
DESCRIPTION OF PROPOSAL:	Residential Development
PLAN REFERENCE: (relied upon in report preparation)	Stage 1 Masterplan prepared by Buchan (ref 218255 / August 2019)
BAL RATING:	BAL 12.5 <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:	191032
REPORT DATE:	5 th September 2019
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 2006*.

Signature:  Date: 5th September 2019

