

Bush Fire Constraints and Opportunities Assessment

Proposed:
**Seniors Living /
Residential Development**

At:
**216 & 234 Pacific Highway,
Charmhaven**

Reference Number: 211618

Prepared For:
Capital Property Solution Pty Ltd

5th October 2021

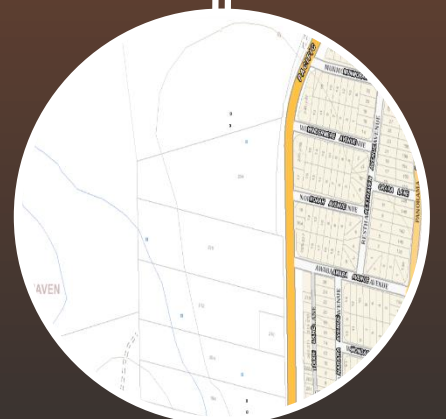
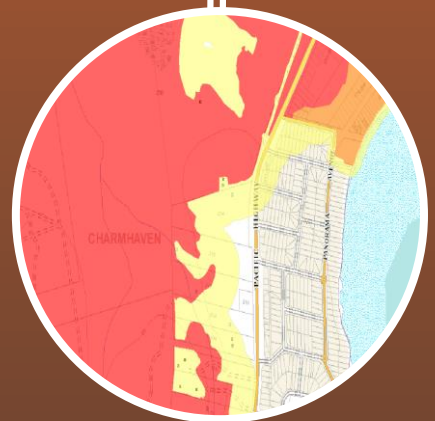
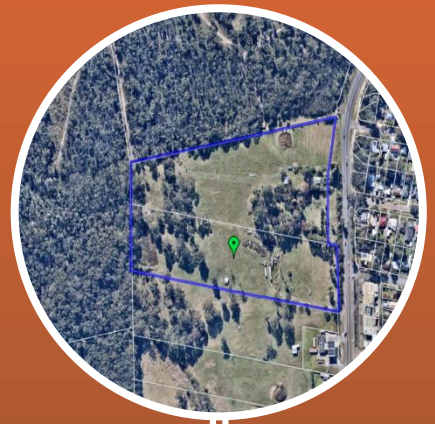


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List of Abbreviations

APZ	Asset Protection Zone
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
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection
RF Act	Rural Fires Act 1997
RFS	NSW Rural Fire Service
SFPP	Special Fire Protection Purpose
SEPP	State Environmental Planning Policy
SWS	Static Water Supply

1.0 Executive Summary

Building Code and Bushfire Hazard Solutions Pty Ltd has been engaged by Capital Property Solution Pty Ltd to provide advice on the likely bushfire protection measures (BPMs) that will be applicable to future Seniors Living and residential development at 216-234 Pacific Highway, Charmhaven.

This document is for planning purposes only and not suitable for submission as supportive documentation for any Development Application.

The subject site is depicted on Council's Bushfire Prone Land Map as partially containing Category 1 Vegetation and the 100 metre buffer zone from designated Category 1 Vegetation. Any future development application for a seniors living development will be considered Special Fire Protection Purpose (SFPP) and residential subdivision or multi-unit housing is captured under s100B of the *Rural Fires Act* 1997. Any future application must apply for a bushfire safety authority from the Commissioner of the NSW Rural Fire Service (RFS).

Any future application must include an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Planning for Bush Fire Protection.

The application of PBP will require satisfactory demonstration of the following BPMs:

- Asset Protection Zones
- Building Construction & Design
- Landscaping
- Emergency Management Arrangements
- Water Supply & Utilities
- Access Arrangements

An Asset Protection Zone (APZ) is an area between the development and the identified bushfire hazards and is generally the most significant BPM when it comes to site restrictions and viability of future development.

APZs for new SFPP are determined from the prescriptive tables in PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m² at the closest point of the available building footprint.

APZs for new residential subdivision or multi-unit housing are determined from the prescriptive tables in PBP or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m² at the closest point of the available building footprint.

The attached APZ Overlay depicts the impact of the minimum required APZs for new SFPP development and residential or multi-unit development on the subject site. Where future compliance is achieved with these setbacks and other Bushfire Protection Measures described herein generally the application would be considered to have a relatively low risk of refusal.

2.0 Introduction

The area subject to this assessment comprises of two allotments (Lot 1 DP 335574 and Lot 332 DP 18234) – 21- & 234 Pacific Highway, Charmhaven. This assessment assumes that all land within the site can be managed as an APZ - Inner Protection Area (IPA).

The subject site is depicted on Council's Bushfire Prone Land Map as partially containing Category 1 Vegetation and the 100 metre buffer zone from Category 1 Vegetation. The application of Planning for Bush Fire Protection and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' is therefore triggered for any future development application.

Any future seniors living development and / or residential subdivision will be captured under s100B of the *Rural Fires Act 1997* and subsequently must apply for a bushfire safety authority from the Commissioner of the NSW Rural Fire Service. The application must include an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Planning for Bush Fire Protection.

The application of Planning for Bush Fire Protection will require satisfactory demonstration of the following bushfire protection measures (BPMs):

- Asset Protection Zones
- Building Construction & Design
- Landscaping
- Emergency Management Arrangements
- Water Supply & Utilities
- Access Arrangements

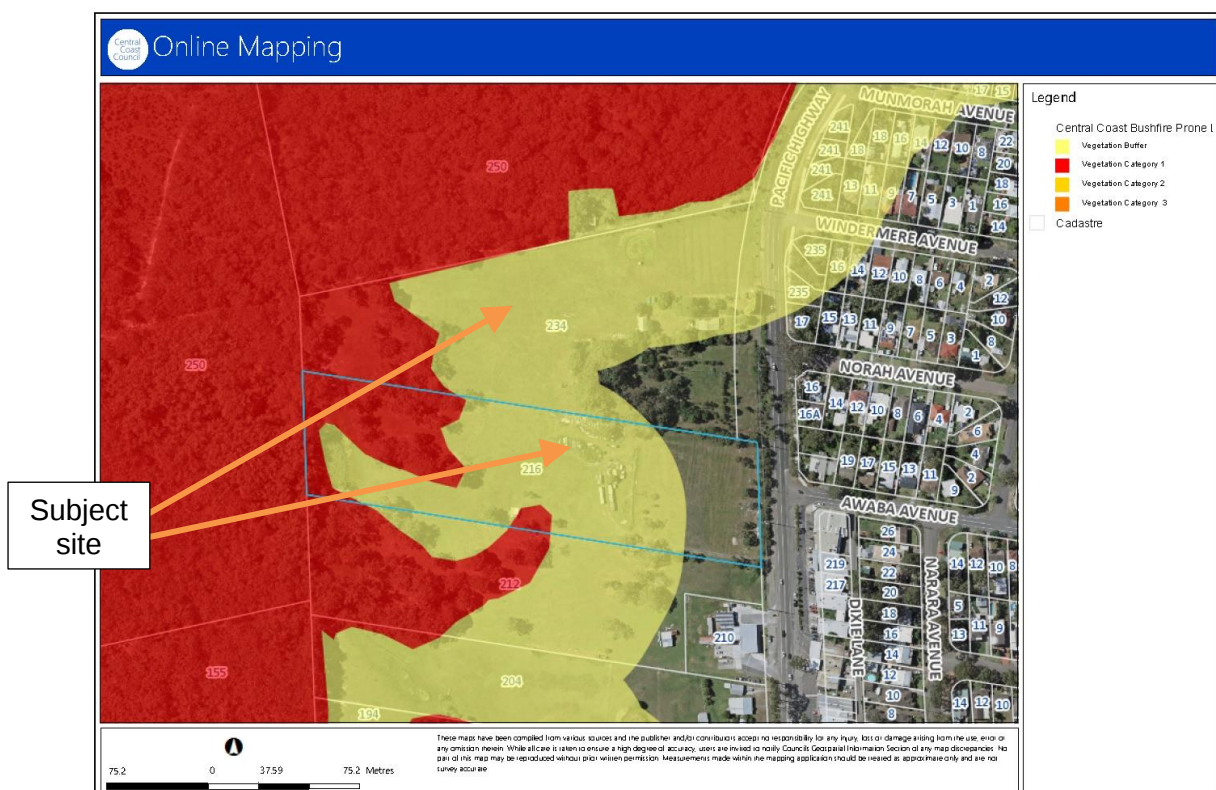


Figure 01: Extract from Council's Bush Fire Prone Lands Map

3.0 Purpose

The purpose of this report is to outline the likely required bushfire mitigation measures that would be applicable for a future seniors living development at 216 & 234 Pacific Highway, Charmhaven.

This document is for information purposes only and not suitable for submission as supportive documentation for any Development Applications.

4.0 Location

The subject site comprises of two allotments (Lot 1 DP 335574 and Lot 332 DP 18234) – 21- & 234 Pacific Highway, Charmhaven.

The subject site is located within Central Coast Councils local government area and is zoned RU6 'Transition'.

The subject site has street frontage to the Pacific Highway to the east and abuts similar private allotments to the north and south and vegetated allotments to the west.



Figure 02: Aerial view of the subject area (C/- Nearmap.com)

5.0 Asset Protection Zones

An Asset Protection Zone (APZ) is an area between the development (in this instance available building envelopes) and the identified bushfire hazard. The APZ is an area where the fuels are maintained to a minimum to prevent the spread of fire between the hazard and the building / asset.

There are minimum required APZs for Special Fire Protection Purpose (SFPP) developments. These minimum required APZs must demonstrate the calculated radiant heat impact will not exceed 10kW/m^2 at the closest point of the available building footprint.

There are also minimum required APZs for Residential Subdivision or multi-unit housing developments. These minimum required APZs must demonstrate the calculated radiant heat impact will not exceed 29kW/m^2 at the closest point of the available building footprint.

The depth of the APZ is determined by the vegetation structure (within the hazard for a distance of 100m), effective slope (within the hazard for a distance of 100 metres) and the type of development (residential subdivision, multi-unit housing or Special Fire Protection Purpose).

The vegetation identified as posing a bushfire hazard to the subject site is within unmanaged adjoining allotments to the north and west and grassland within neighbouring allotments to the south.

The vegetation posing a hazard to the north and west within the 140 metre assessment area was found to comprise of trees 5-15 metres in height with a >50% canopy cover and an understorey of shrubs, sedges and grasses.

The neighbouring allotments to the south were found to consist primarily of horse paddocks subject to grazing. At the time of our site inspection and in considering historic aerial imagery, the ongoing management of the grassland within the neighbouring allotments cannot be guaranteed and therefore in applying a conservative assessment, the properties to the south have been determined to be a grassland hazard.

For the purpose of assessment we have assessed the vegetation to the north and west as Forest.

This assessment has assumed that all grounds within the subject site can be and will continue to be managed as an APZ. To ensure ongoing management of these areas the NSW RFS may request the implementation of a formal management agreement or plan of management.

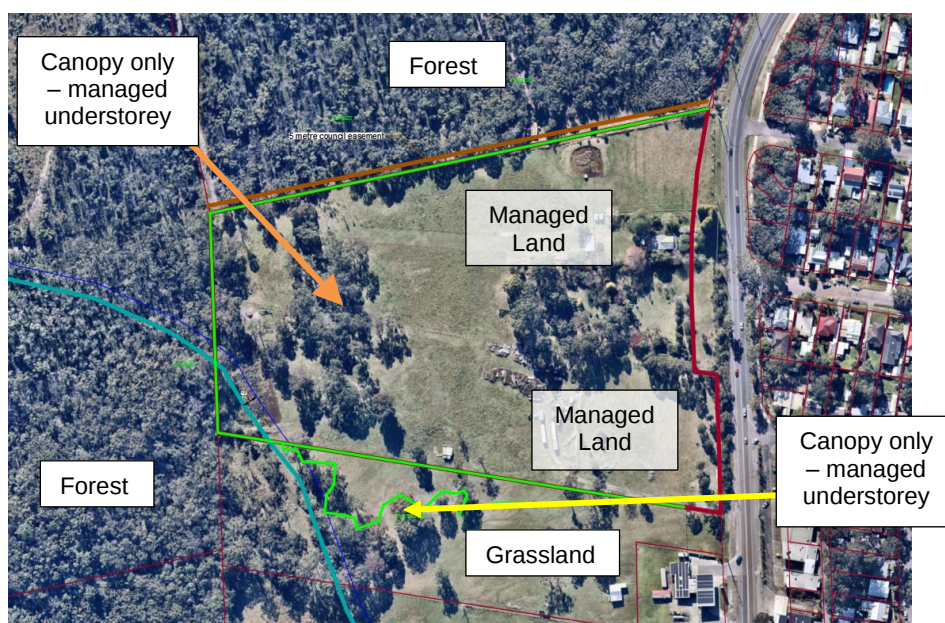


Figure 03: Vegetation assessment

6.0 Slope Assessment

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from within the bushfire hazard.

The effective slope was determined using 1 metre LiDar contour mapping of the subject area in conjunction with site observations.

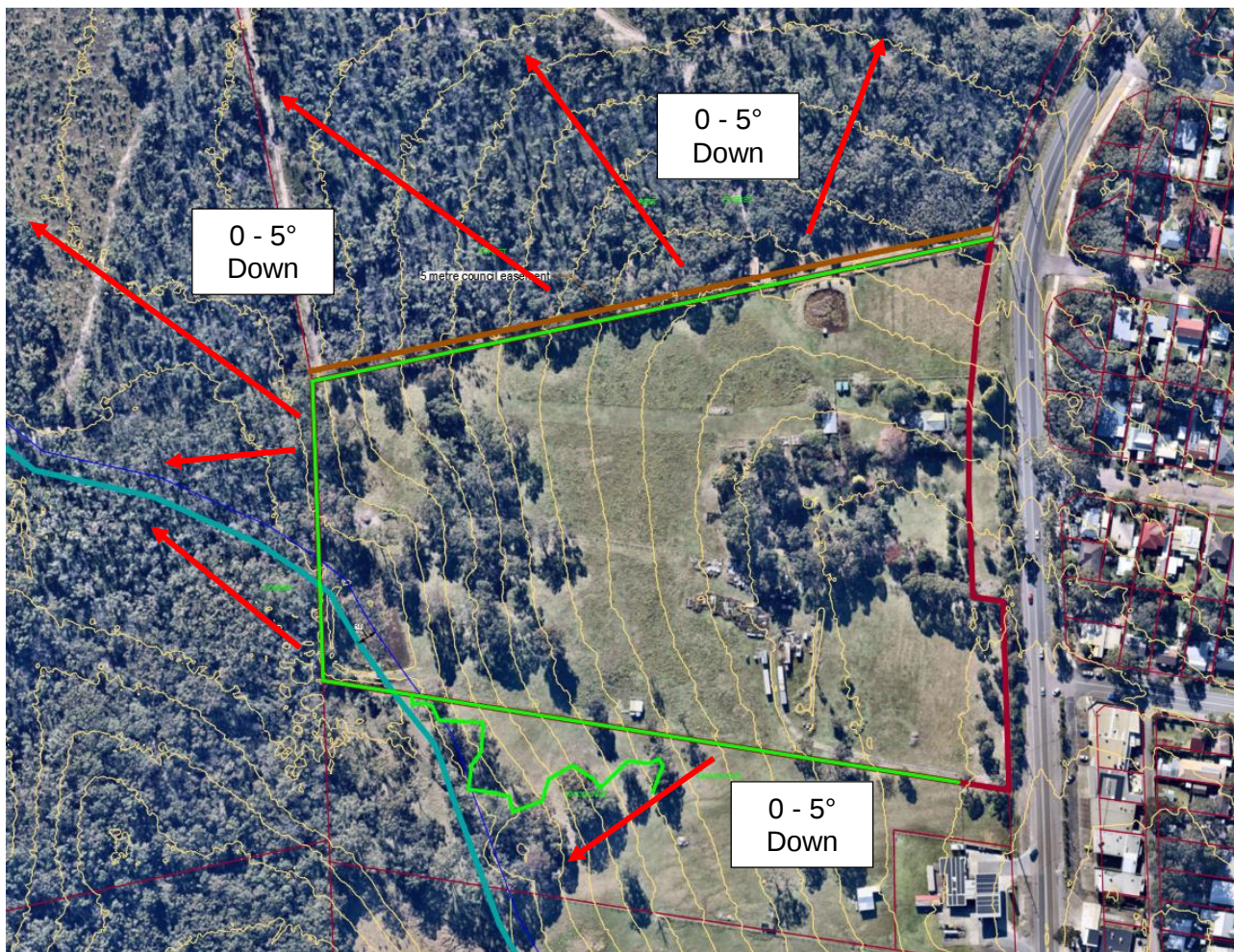


Figure 04: 1 metre LiDar contours of the subject area

Constraints: Special Fire Protection Purpose (SFPP)

Asset Protection Zones for new SFPP development are determined from the prescriptive tables in PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m² at the closest point of the available building footprint.

The attached 'APZ Overlay' depicts the minimum required Asset Protection Zones for new SFPP development under Planning for Bush Fire Protection 2019. The minimum required APZs have been determined from the prescriptive tables within PBP to be **79 metres** to the north and west and 40 metres to the south.

In this instance the resultant minimum required Asset Protection Zones for new SFPP development can be accommodated while having development opportunity within the site. As shown on the

attached overlay the APZ is located entirely within the subject site and includes existing managed lands.

Where future compliance is achieved with these setbacks generally the application would be considered to have a relatively low risk of refusal.

Constraints: Residential development (Subdivision / Multi-unit housing)

Asset Protection Zones for new residential development are determined from the prescriptive tables in PBP or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m² at the closest point of the available building footprint.

The attached 'APZ Overlay' depicts the minimum required Asset Protection Zones for residential development under Planning for Bush Fire Protection 2019. The minimum required APZs have been determined from the prescriptive tables within PBP to be **29 metres** to the north and west and 12 metres to the south.

In this instance the resultant minimum required Asset Protection Zones for residential development can be accommodated while having development opportunity within the site. As shown on the attached overlay the APZ is located entirely within the subject site and includes existing managed lands.

Where future compliance is achieved with these setbacks generally the application would be considered to have a relatively low risk of refusal.

Opportunities – Maximising the APZ:

Non-habitable (Class 10) structures are permitted within the APZs, these include car parking, play equipment, active open space, swimming pools, tennis courts and the like.

Opportunities – Higher density outside APZs:

The minimum required Asset Protection Zones for new SFPP development are the same regardless of density. In this regard higher density development could be introduced outside the new SFPP Asset Protection Zones to achieve higher yield.

Additionally, multi-unit housing within the area outside the Residential APZs could provide for a higher yield

7.0 Access

Planning for Bush Fire Protection addresses design considerations for internal roads for properties determined to be bushfire prone.

There is opportunity to satisfy the access requirements by way either demonstrating compliance with the Acceptable Solutions or Performance Criteria (alternate solution). It is strongly encouraged that in the first instance compliance with the Acceptable Solutions is targeted.

The SFPP access requirements under PBP - 2019 include;

GENERAL REQUIREMENTS

Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.

- SFPP access roads are two-wheel drive, all-weather roads;
- access is provided to all structures;
- traffic management devices are constructed to not prohibit access by emergency services vehicles;
- access roads must provide suitable turning areas in accordance with Appendix 3; and
- one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression
- 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.
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
- hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; and
- there is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available.

PERIMETER ROADS

- there are two-way sealed roads;
- minimum 8m carriageway width kerb to kerb;
- parking is provided outside of the carriageway width;
- hydrants are to be located clear of parking areas;
- there are through roads, and these are linked to the internal road system at an interval of no greater than 500m;
- curves of roads have a minimum inner radius of 6m;
- the maximum grade road is 15 degrees and average grade of not more than 10 degrees;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

NON- PERIMETER ROADS

- minimum 5.5m carriageway width kerb to kerb;
- parking is provided outside of the carriageway width;

- hydrants are located clear of parking areas;
- there are through roads, and these are linked to the internal road system at an interval of no greater than 500m;
- curves of roads have a minimum inner radius of 6m;
- the maximum grade road is 15 degrees and average grade of not more than 10 degrees;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

The Residential Access requirements include the following:

- property access roads are two-wheel drive, all-weather roads;
- perimeter roads are provided for residential subdivisions of three or more allotments;
- subdivisions of three or more allotments have more than one access in and out of the development;
- traffic management devices are constructed to not prohibit access by emergency services vehicles;
- maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient;
- all roads are through roads;
- dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are
- clearly sign posted as a dead end;
- where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road;
- where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system;
- and one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression
- the capacity of perimeter and non-perimeter road surfaces and bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
- hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and
- there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

The preferred design option of the NSW Rural Fire Service is that perimeter roads are provided (Loop roads with no dead-ends) and multiple egress routes. The minimum carriageway for perimeter roads is 8 metres, this applies to both SFPP and Residential development.

The Acceptable Solution for internal roads is that all roads are through roads, and that these are linked to the internal road system at an interval of no greater than 500 metres.

The complete Acceptable Solutions under PBP - 2019 have been attached to this report.

8.0 Services

Water Supply:

Any future development must comply with the water supply requirements detailed in Planning for Bush Fire Protection. These requirements can be achieved in two ways, being:

- reticulated water is to be provided to the development, where available.
- a static water supply is provided where no reticulated water is available.

Given the scale of the proposal it would be considered likely that any future development will be serviced by a hydrant system. In this regard the following are the relevant Acceptable Solutions applicable for reticulated water supplies:

- fire hydrant spacing, design and sizing comply with the Australian Standard AS 2419.1:2005, and
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression, and
- reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads, and
- fire hydrant flows and pressures comply with AS 2419.1:2005, and
- all above-ground water service pipes external to the building are metal, including and up to any taps.

Planning for Bush Fire Protection also addresses the installation of services (i.e. electricity and gas) within bushfire prone areas. The following are the requirements for the relevant services.

Electricity:

- where practicable, electrical transmission lines are underground, and
- where overhead, electrical transmission lines are proposed as follows:
 - lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas, and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in *ISSC3 Guideline for Managing Vegetation Near Power Lines*

Gas:

- 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, and
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side, and
- connections to and from gas cylinders are metal, and
- if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion, and
- polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not used, and
- above-ground gas service pipes external to the building are metal, including and up to any outlets.

9.0 Construction

The provision of the minimum required Asset Protection Zones for new SFPP (no closer) under PBP - 2019 result in a Bushfire Attack Level of BAL 12.5 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018.

The minimum required Asset Protection Zones for new residential development under PBP - 2019 result in a Bushfire Attack Level of BAL 29 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018.

Further downgrades in the required construction level can be applied where the setbacks to the bushfire hazards are increased from any bushfire hazard.

10.0 Development Risks

Bushfire protection measures can have a significant impact on development costs, viability and timing. Understanding the relevant specifications and requirements of Planning for Bush Fire Protection at the due diligence phase is essential to ensure that the development can be delivered on time, within budget and with the desired yield.

Yield:

We have identified that the proposed site is viable under PBP - 2019 provided the minimum required Asset Protection Zones do not result in an unacceptable environmental impact.

Timing of development:

It is of our opinion that should the proposed development comply with the detail contained herein then we will be in a position to put forward a favourable report for a Development Application. Furthermore by satisfying Acceptable Solutions contained herein the risk of extended delays caused by requests for additional information during the assessment phase is minimised as the proposal will be able to demonstrate compliance with the prescriptive requirements of PBP.

Where the proposal seeks to demonstrate compliance with PBP via an alternative solution this can lead to extended assessment periods by the NSW Rural Fire Service to facilitate their verification process.

End Product:

The bushfire protection measures applied to the proposal at the master planning level are unlikely to result in a significant cost increase.

11.0 Conclusion

In this instance the subject site is depicted on Central Coast Council's Bushfire Prone Land Map as containing designated Category 1 Vegetation and the associated 100 metre buffer zone from Category 1 Vegetation. The application of Planning for Bush Fire Protection and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' is therefore triggered for any future development.

Any future Special Fire Protection Purpose development and / or residential subdivision or multi-unit development must demonstrate compliance with the bushfire protection measures detailed herein.

Comments provided are based on advice received from the NSW Rural Fire Service and the requirements of the *Environmental Planning and Assessment Act 1979*, the *Rural Fires Act 1997*, the *Rural Fires Regulations 2013*, *Planning for Bush Fire Protection 2019*, and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018.

It is of our opinion that should the proposed development comply with the detail contained herein then we will be in a position to put forward a favourable report for a Development Application.

Should you have any further questions please do not hesitate in contacting myself.

Prepared by
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Disclaimer:

Quote from Planning for Bush Fire Protection 2006, 'Any representation, statement opinion, or advice expressed or implied in this publication is made in good faith on the basis that the State of New South Wales, the NSW Rural Fire Service, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.'

Similarly the interpretations and opinions provided by Building Code and Bushfire Hazard Solutions in regard to bushfire protection are also given in the same good faith.

List of Referenced Documents

- a) Environmental Planning and Assessment Act 1979
- b) Rural Fires Act 1997
- c) "Planning for Bush Fire Protection" - NSW Rural Fire Services 2019
- e) "Construction of buildings in bushfire-prone areas" - AS 3959 – 2018 (as amended)
- f) "Central Coast Council's Bushfire Prone Land Map"
- g) Acknowledgements to:
 - Central Coast Council – Online Mapping
 - SixMaps © NSW Government
 - Geoscience Australia
 - Nearmap

Attachments

Attachment 01: SFPP & Residential APZ Overlay

Attachment 02: Access requirements PBP - 2019

The site is constrained by vegetation within neighbouring allotments.

This overlay assumes all grounds within the site can be managed.

The setback distances required under table A1.12.1 for SFPP development and Table A1.12.5 for residential development of PBP could increase if a riparian setback is required from the identified watercourse within the western portion of the site.

The site is also identified on the Biodiveristy Mapping site (NW corner).

The setback to the north includes a 5 metre Council easement within the neighbouring allotment to the north.

Additionally, a conservative assessment has been applied in relation to the ongoing management of the vegetation within the neighbouring allotment to the south.



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LEGEND

- MINIMUM SETBACK SFPP
- 1m CONTOUR (GEOSCIENCE AUST)
- MINIMUM SETBACK RESIDENTIAL

BUSHFIRE SFPP & RESIDENTIAL CONSTRAINTS OVERLAY



REFERENCE NO.	211618	LOT 332 DP18234 & LOT 1 DP 335574			
ADDRESS	216-234 PACIFIC HIGHWAY, CHARMHAVEN NSW				
DATE.	22/07/2021		DRAWN BY	IT	SCALE: NTS
REVISION	C	REVISION DATE	03/10/2021		MGA20C/56
CLIENT	CAPITAL PROPERTY SOLUTION P/L				

APPENDIX 3

ACCESS

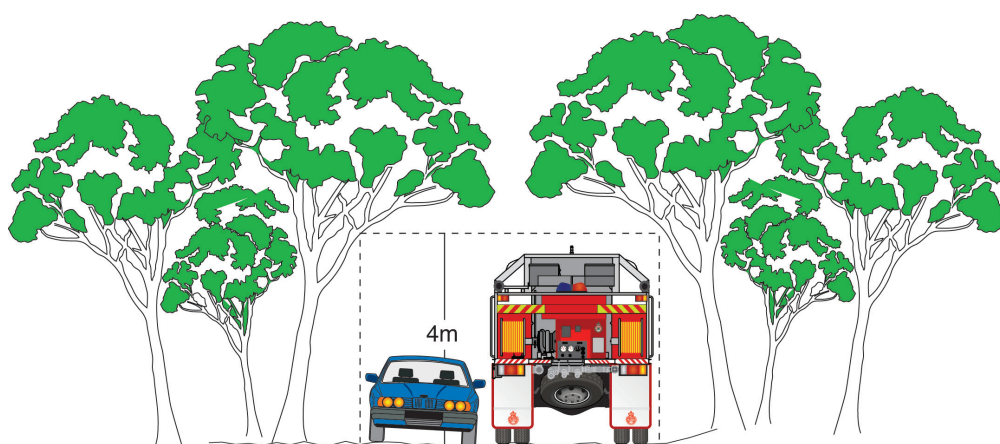
This appendix provides design principles for emergency service vehicle access.

A3.1 Vertical clearance

An unobstructed clearance height of 4 metres should be maintained above all access ways including clearance from building construction, archways, gateways and overhanging structures (e.g. ducts, pipes, sprinklers, walkways, signs and beams). This also applies to vegetation overhanging roads.

Figure A3.1

Vertical clearance.



A3.2 Vehicle turning requirements

Curved carriageways should be constructed using the minimum swept path as outlined in Table A3.2.

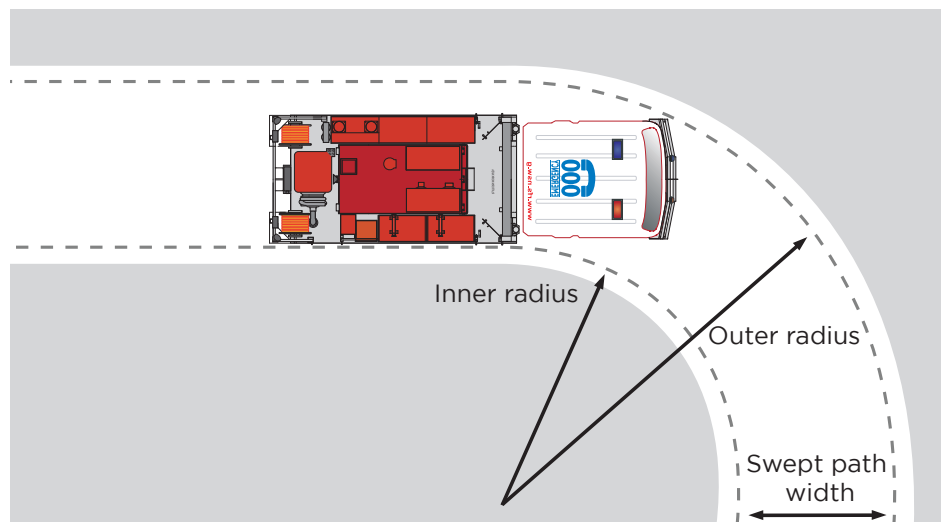
Table A3.2

Minimum curve radius for turning vehicles.

Curve radius (inside edge in metres)	Swept path (metres width)
< 40	4.0
40 - 69	3.0
70 - 100	2.7
> 100	2.5

Figure A3.2a

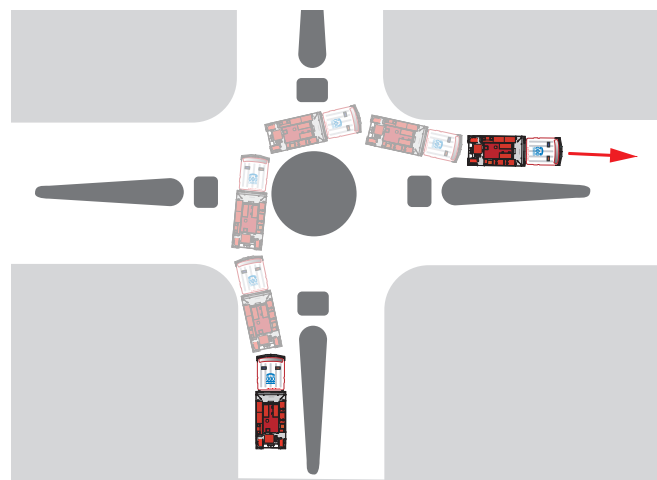
Swept path width for turning vehicles.



The radius dimensions given are for wall to wall clearance where body overhangs travel a wider arc than the wheel tracks (vehicle swept path). The swept path shall include an additional 500mm clearance either side of the vehicle.

Figure A3.2b

Roundabout swept path.



Example of a swept path as applied to a roundabout. The distance between inner and outer turning arcs allows for expected vehicle body swing of front and rear overhanging sections (the swept path).

A3.3 Vehicle turning head requirements

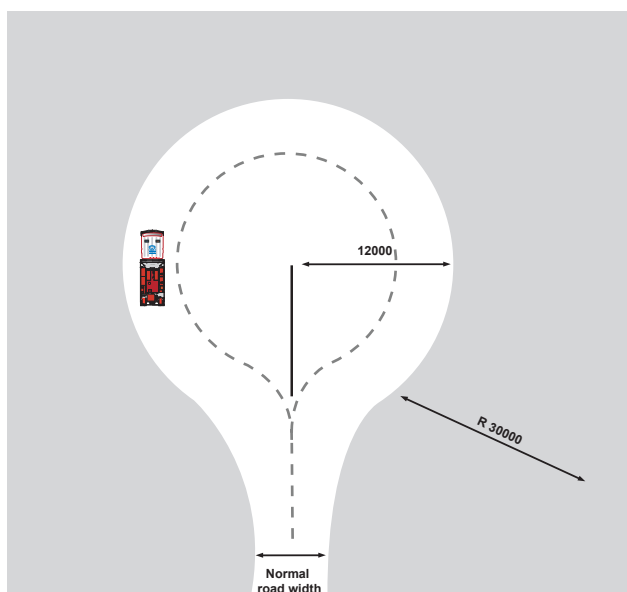
Dead ends that are longer than 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

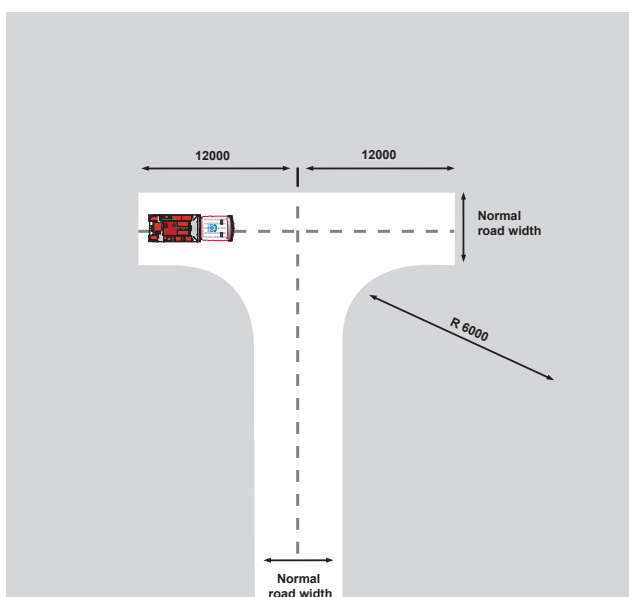
Figure A3.3

Multipoint turning options.

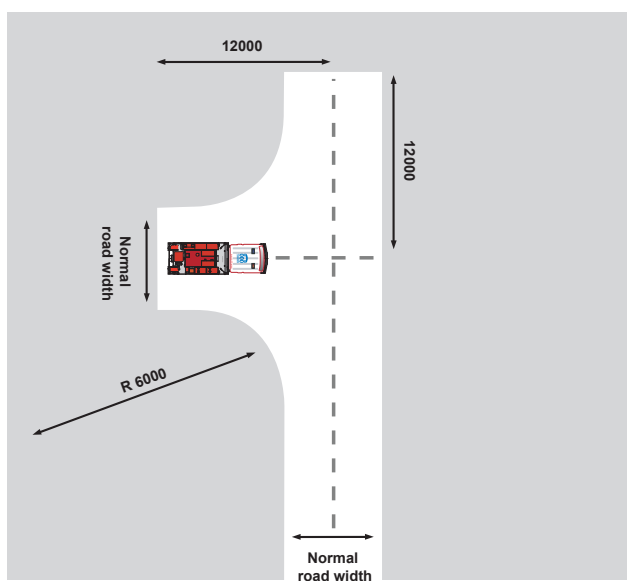
Type A



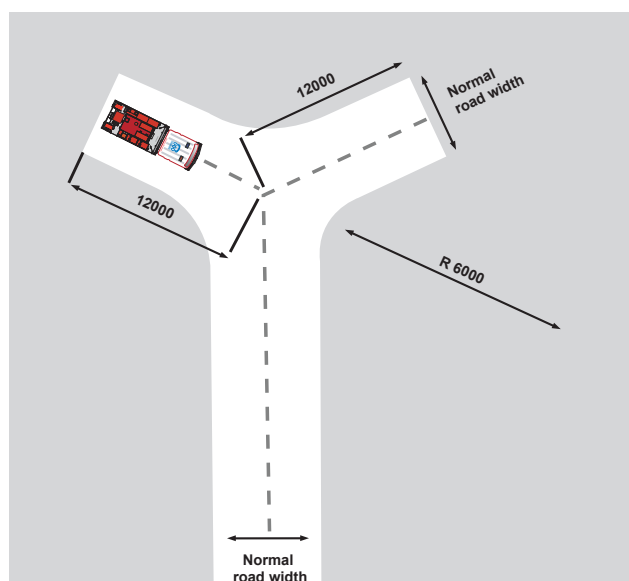
Type B



Type C



Type D



A3.4 Passing bays

The construction of passing bays, where required, shall be 20m in length and provide a minimum trafficable width at the passing point of 6m.

Figure A3.4

Passing bays can provide advantages when designed correctly. Poor design can and does severely impede access.



A3.5 Parking

Parking can create a pinch point in required access. The location of parking should be carefully considered to ensure fire appliance access is unimpeded. Hydrants shall be located outside of access ways and any parking areas to ensure that access is available at all times.

Figure A3.5

Hydrants and parking bays.

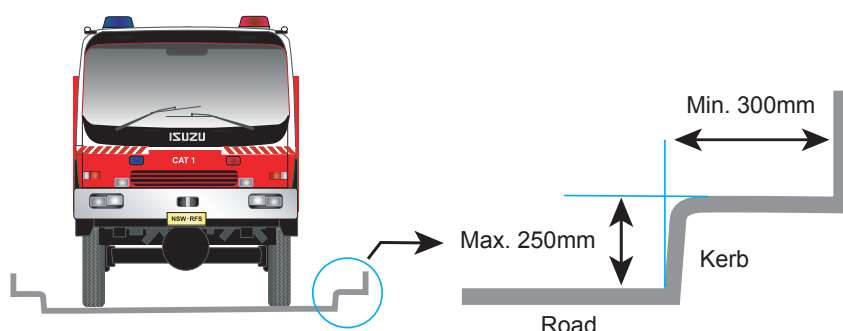


A3.6 Kerb dimensions

All kerbs constructed around access roads should be no higher than 250mm and free of vertical obstructions at least 300mm back from the kerb face to allow clearance for front and rear body overhang.

Figure A3.6

Carriageway kerb clearance dimensions.



A3.7 Services

Hydrant services should be located outside the carriageway and parking bays to permit traffic flow and access. Setup of standpipes within the carriageway may stop traffic flow. Hydrant services shall be located on the side of the road away from the bush fire threat where possible.

A3.8 Local Area Traffic Management (LATM)

The objective of LATM is to regulate traffic an acceptable level of speed and traffic volume within a local area.

Traffic engineers and planners should consider LATM devices when planning for local traffic control and their likely impact on emergency services. LATM devices by their nature are designed to restrict and impede the movement of traffic, especially large vehicles.

Where LATM devices are provided they are to be designed so that they do not impede fire vehicle access.