BEMC

Bushfire Environmental Management Consultancy

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

BUSH FIRE ASSESSMENT REPORT

Special Fire Protection Purpose

Caravan Park (Blueys Beach) The Lakes Way, Charlotte Bay, NSW, 2428

Lot 110 / DP 1091944 Lot 1 / DP 1172370 Lot 112 / DP 1091944

Reference #:231311

FPA AUSTRALIA BRONZE MEMBER Fire Protection Association Australia

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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Title	Bush Fire Assessment Report – Special Fire Protection Purpose			
Description	Special Fire Protection Purpose Caravan Park (Blueys Beach) The Lakes Way, Charlotte Bay, NSW, 2428			
Created By	Duncan Scott-Lawson 0408 667 137 duncan@emconsultancy.com.au			
Prepared For:	Brett Phillips brett.phillips@landsas.com.au 0408 965 444			
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Abbreviations and Acronyms

AHIMS	Aboriginal Historic Information Management System
APZ	Asset Protection Zone
AS/NZS 1221:1997	Australian Standard – Fire hose reels
AS1596-2014	Australian Standard – The storage and handling of LP Gas
AS2419-2021	Australian Standard – Fire hydrant installations
AS2441:2005	Australian Standard – Fire hose reels installation
AS3745:2010	Australian Standard – Planning for emergencies in facilities
AS3959-2018	Australian Standard – Construction of buildings in bush fire prone areas
AS4083:2010	Planning for emergencies – Health care facilities
BAL	Bush fire Attack Level
BCA	Building Code of Australia
BFSS	Bush Fire Strategic Study
BPA	Bush fire Prone Area (Also Bush fire Prone Land)
BPL Map	Bush fire Prone Land Map
BPMs	Bush fire Protection Measures
BV	Biodiversity Values
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
FFDI	Forest Fire Danger Index
GFDI	Grass Fire Danger Index
ha	Hectare
HOC	Heat Of Combustion
IPA	Inner Protection Area
kJ/kg	Kilo Joules per Kilo gram
LGA	Local Government Area
LAT	Large Air Tanker
OPA	Outer Protection Area
PBP	Planning for Bush fire Protection
RF Act	*Rural Fires Act 1997*
RF Regs	*Rural Fires Regulations 2013*
RHG	Restricted Head Growth
SEED	Central Resource for Sharing and Enabling Environmental Data
SFR	Short Fire Run
SFPP	Special Fire Protection Purpose

1 EXECUTIVE SUMMARY

BEMC Pty Ltd was engaged by Brett Phillips to complete a Bush Fire Assessment Report (BFAR) on the proposed Special Fire Protection Purpose at Caravan Park (Blueys Beach) The Lakes Way, Charlotte Bay, NSW, 2428 **(Figure 1, page 9).** The proposed development includes 130 short-term sites, 70 camping sites, clubhouse and associated infrastructure.

BEMC has used Method 1 assessment pathway from PBP 2019 to undertake this assessment and to prepare the Bush Fire Assessment Report (BFAR).

Based upon the assessment, perusal of the site plan prepared by OGE Group Architects **(Appendix 1, page 28)**, and a site visit, it is recommended that development consent be granted subject to the following conditions to comply with PBP 2019:

Recommendation 1 - Asset Protection Zones
The tree density of the vegetation between the development and The Lakes Way to the west, and between the development and private property to the south is > than 15% (**Plate 5 and 6, page 42**). The shrub and ground cover under this tree density is currently managed. Together with the separation offered by The Lakes Way and the residential development, this level of clearance and ongoing management beneath the canopy will not support canopy fire. **Appendix 6 page 46** provides analysis to illustrate canopy removal is not required to meet the objectives of PBP and provides a positive outcome (capturing embers prior to them reaching the development) an no tree removal is required.

At the commencement of building works and in perpetuity the surface, near surface and elevated fire fuels in and around the proposed development as noted in **Figure 2 page 10** of this report, be maintained to inner protection area (IPA) standards as outlined within Appendix 4 of Planning for Bush Fire Protection 2019 and the NSW RFS document Standards for Asset Protection Zones. Tree canopy density not beyond 40% coverage at maturity.

A >67m APZ is provided in accordance with Table A1.12.1. All short-term sites are located in areas exposed to <10kW/m2 radiant heat exposure.

Primitive camping and glamping along the eastern boundary of the proposed development in areas >10kW/m^2.

The clubhouse is >500m^2 public assembly and does not meet the 10kW/m^2 radiant heat separation. The club house is exposed to <19kW/m^2 with a 32m separation.

Within stage 21 a 67m temporary APZ shall be established with within future stage 2. Within stage 2, a 67m temporary APZ shall be established with within future stage 3.

A suitably worded instrument, pursuant to section 88 of the Conveyancing Act 1919, shall be established for the provision of temporary asset protection zone (APZ) in accordance with this report. The name of authority empowered to release, vary, or modify the instrument shall be Mid Coast Council. The temporary APZ shall extinguish once the CC has been issued for future stages.

Recommendation 1 - Landscaping

A landscaping plan is required to illustrate:

- The ongoing maintenance of the shrub and ground vegetation between the development and The Lakes Way to the west, and between the development and private property to the south to ensure no shrub vegetation is established or allowed to grow and grasses are maintained <10cm in height. No tree removal is required in this area.
- Within the development area (blue outline on **Figure 2, page 10**):
  - Tree density shall be <30% and shrubs vegetation not located under tree canopy.
  - 1.5m separation is provided between the building-to-shrub/garden vegetative fuels with a smooth ground surface within this separation immediately adjacent to buildings.
- No flammable rough ground surfaces (bark/mulch gardens beds) within 6m of the building, stairs, or decks.

A Landscaping plan is required to illustrate compliance with the intent of APZ standards is required for the area identified in Figure 2 page 9. This Landscaping plan shall be endorsed by a BPAD level 3 bushfire consultant prior to Construction Certificate stage.

Recommendation 2 - Construction Standards

New construction of the tiny houses and cabins identified within 100m of the bushfire threat must comply with section 3 and section 5 (BAL 12.5) Australian Standard AS3959-2018 Construction of buildings in bush fire-prone areas or NASH Standard National Standard Steel Framed Construction in Bushfire Areas – 2021.

The club house is provided a separation to accommodate BAL 19 construction, although construction of the clubhouse must comply with section 3 and section 7 (BAL 29) Australian Standard AS3959-2018 Construction of buildings in bush fire-prone areas or NASH Standard National Standard Steel Framed Construction in Bushfire Areas – 2021.

No construction requirements for glamping or camping.

Recommendation 3 - Access

All access roads shall comply with:

- SFPP access roads are two-wheel drive, all-weather roads.
- Access is provided to all structures.
- The capacity of private property access 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.
- 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.
- 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.
- There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
- 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.

Perimeter road and road network throughout camping and glamping areas (yellow and black dash line as illustrated in **Figure 2, page 9**) shall comply with private property access:

- Minimum 4m carriageway width.
- In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay.
- A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.
- Provide a suitable turning area in accordance with 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 access by dedication of a road and not by right of way.

Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), 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.

All other roads shall be constructed to non-perimeter road requirements (solid yellow and black line as illustrated in **Figure 2, page 10**):

- Minimum 5.5m carriageway width kerb to kerb.
- Parking is provided outside of the carriageway width.
- Hydrants are located clear of parking areas.
- Roads 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.

Recommendation 4 - Water Supply

All above-ground water service pipes are metal, including and up to any taps

Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021;

Hydrants are not located within any road carriageway; and

Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.

Recommendation 5 - Emergency Management

The Bush Fire Emergency Management and Operation Plan shall:

- Be consistent with the NSW RFS document: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*.
- Be consistent with *Australian Standard AS 3745:2010 Planning for emergencies in facilities*.
- Incorporate S.72(9) from the EP&A Regs (2021) for entertainment venues.

- Be provided to the Local Emergency Management Committee for its information prior to occupation of the development.
- Establishes an Emergency Management Committee with responsibilities for decisions identified.
- Provides decision triggers to inform when to evacuate and all potential evacuation routes.
- Provides guidance on the appropriate management actions during elevation fire danger days.
- An appropriate refuge location should also be considered if bushfire prevents evacuation.
- Consider the amount of travel likely to be generated during an emergency evacuation; the capacity of the broader road network to facilitate safe emergency evacuation; limitations/constraints inherent in the road system; and management of potential traffic conflicts (such as emergency vehicles versus evacuating staff).
- The size and age group of the existing population within the locality and the number of other SFPP facilities within the locality.
- Compartmentalises the landscape into bushfire management zones with quantifiable bushfire risk treatment identified in each zone.
- Provide monitoring schedules, and triggers to undertake management and maintenance of Bush fire protection measures.

Finally, the implementation of the adopted measures and recommendations forwarded within this report comply with Planning for Bush fire Protection (2019) and will contribute to the amelioration of the potential impact of any bush fire upon the development, but they do not and cannot guarantee that the area will not be affected by bush fire at some time.

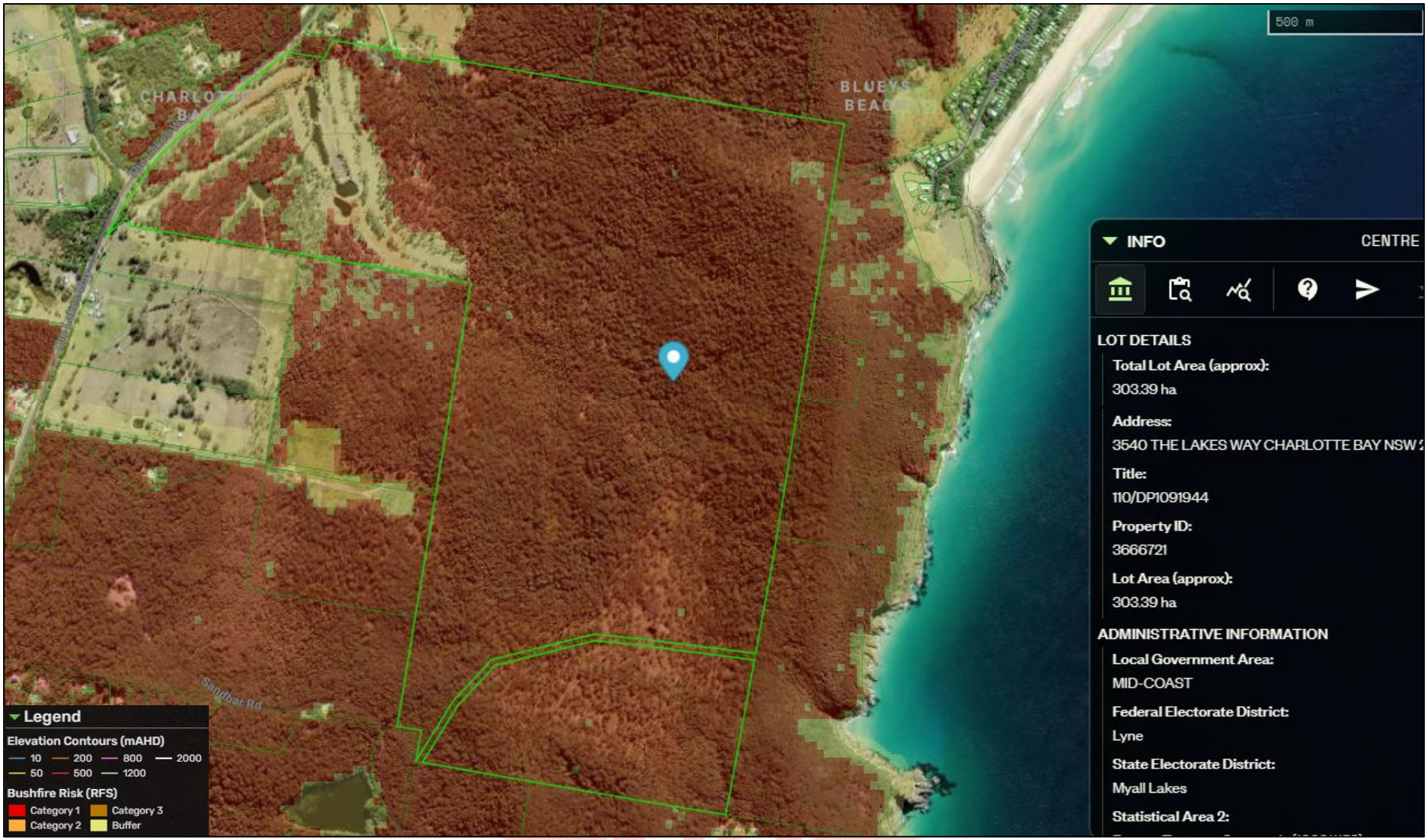

Figure 1 *Property Location of Lot 110 / DP 1091944 Lot 1 / DP 1172370 Lot 112 / DP 1091944 The Lakes Way, Charlotte Bay, NSW (Mecone Mosaic, 2023)*

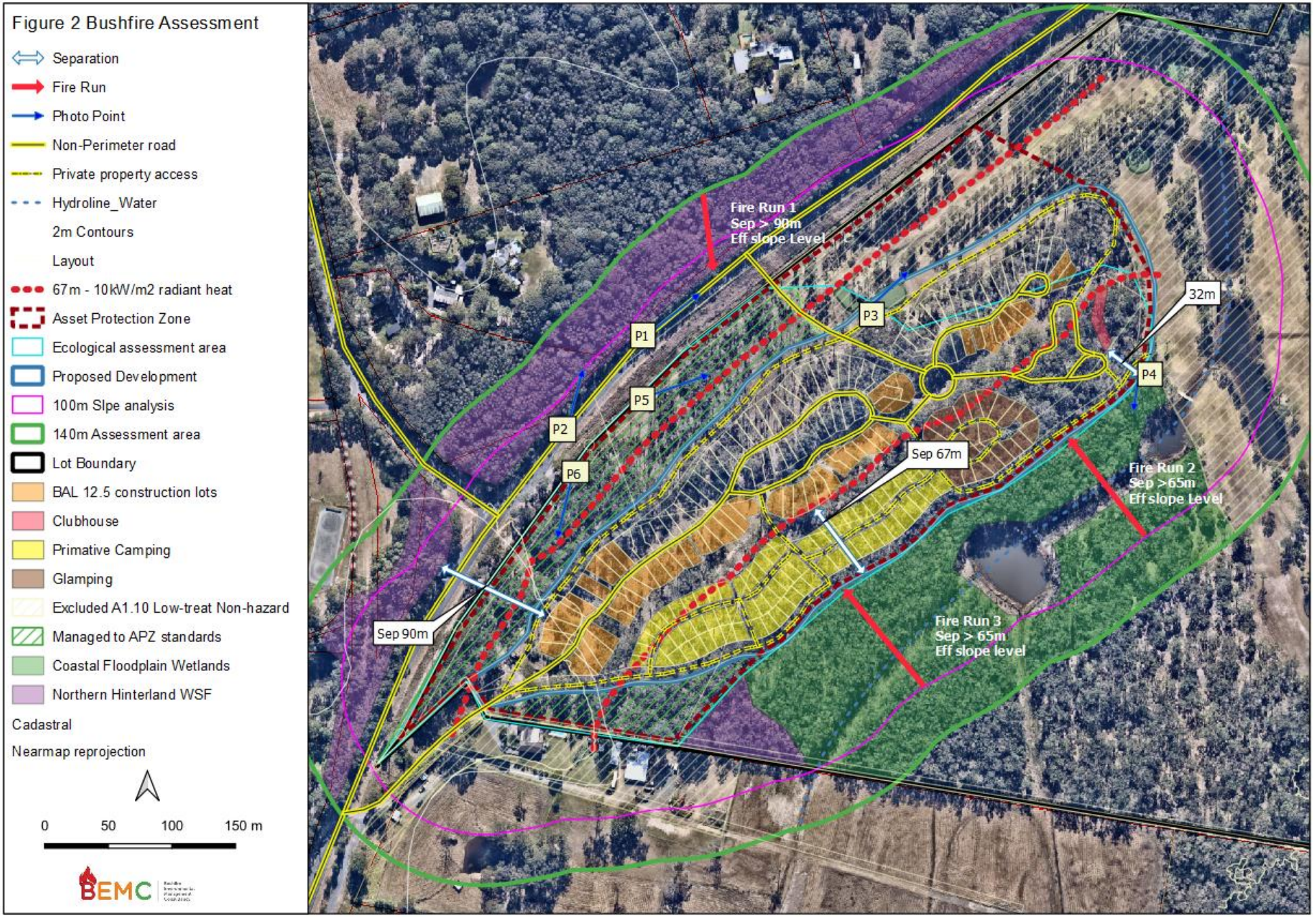
Figure 2 Bushfire Assessment
Separation
Fire Run
Photo Point
Non-Perimeter road
Private property access
Hydroline_Water
2m Contours
Layout
67m - 10kW/m2 radiant heat
Asset Protection Zone
Ecological assessment area
Proposed Development
100m Slpe analysis
140m Assessment area
Lot Boundary
BAL 12.5 construction lots
Clubhouse
Primative Camping
Glamping
Excluded A1.10 Low-treat Non-hazard
Managed to APZ standards
Coastal Floodplain Wetlands
Northern Hinterland WSF
Cadastral
Nearmap reprojection
0
50
100
150 m
BEMC
Fire Run 1
Sep > 90m
Eff slope Level
Fire Run 2
Sep >65m
Eff slope Level
Fire Run 3
Sep > 65m
Eff slope level
Sep 90m
Sep 67m
32m
P1
P2
P3
P4
P5
P6

2 INTRODUCTION

BEMC Pty Ltd was engaged by Brett Phillips to complete a Bush Fire Assessment Report (BFAR) to accompany a Development Application for the Special Fire Protection Purpose development located at The Lakes Way, Charlotte Bay, NSW (**Figure 1, page 9**).

The identification of bush fire prone lands (BPL Map) in NSW is required under s 10.3 of the *EP&A Act*. S. 4.14 of the *EP&A Act* requires development to compliance with Planning for Bushfire Protection, 2019 (PBP 2019) if any part of a development site is affected by bush fire hazard as indicated within the BPL Map.

It is clear from the investigation and assessment of proposal; the site is located within Bush fire Prone Land. This development falls within identified bush fire affected land within the Mid-Coast Council bush fire prone land map and the applicant is required to submit a bush fire assessment consistent with PBP 2019.

If the applicant determines that the project is integrated through the Development Application process, this document can support an application for *General Terms of Agreement* via a *Bush Fire Safety Authority* (BFSA) from NSW Rural Fire Service (RFS) as the report adheres to the requirements of s 45 of the *Rural Fires Regulation* 2013 (RF Regs), Appendix 1, A2.1, A2.1.1 of PBP 2019. The proposed development is not listed under s 46 of the Rural Fire Regulation 2013 (*RF Regs*) excluded from requirements for BFSA. The proposed development is listed under s 47 of the RF Reg as an additional Special Fire Protection Purpose (SFPP) development requiring a BFSA.

2.1 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development includes 130 short-term sites, 70 camping sites, clubhouse and associated infrastructure. As a result, the required objectives for Special Fire Protection Purpose Development have been considered in this assessment.

Table 1 *Description of Proposed development*

Boundaries	Rural land use in all directions.
Topography	Flat / Level
Type of development	SFPP – Caravan Park
Proposed dwellings	The proposed development includes 130 short-term sites, 70 camping sites, clubhouse and associated infrastructure.
Landscaping plan provided	No
Current land-use	Golf course and forested areas
Fire weather	Mid-Coast Council – FFDI - 80

2.2 OBJECTIVES OF ASSESSMENT

To assess the proposed development in consideration of s4.14 of the EP&A Act 1979, PBP 2019 and AS 3959:2018 to enable council to make a determination.

This report assesses whether the development meets the six objectives listed in section 1.1 of PBP 2019, which provide for the protection of human life and minimize impacts on property as follows:

1. Afford buildings and their occupants protection from exposure to a bush fire.
2. Provide for a defendable space to be located around buildings.

3. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
4. Ensure appropriate operation access and egress for emergency services personnel and residents is available.
5. Provide for ongoing management and maintenance of Bush fire Protection Measures (BPMs); and
6. Ensure the utility services are adequate to meet the needs of firefighters.

2.3 Specific Objectives of Special Fire Protection Purpose Developments

The aims and objectives listed in section 1.1 of PBP 2019 remain applicable to Special Fire Protection Purpose developments, however further consideration has been given to these types of developments to ensure Bush fire Protection Measures (BPMs) are fully incorporated at the design stage of the development. The specific objectives of Special Fire Protection Purpose developments outlined in section 6.2 of PBP 2019 are:

- Minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting.
- Provide an appropriate operational environment for emergency service personnel during firefighting and emergency management.
- Ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development, and
- Ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.

2.4 PBP 2019 Addendum

The 2022 edition of the National Construction Code (NCC 2022) contains amendments to its bush fire protection provisions. This includes a suite of new provisions for Class 9 Buildings in bush fire prone areas that accommodate certain types of vulnerable occupants. This Addendum aligns Planning for Bush Fire Protection 2019 (PBP 2019) with NCC 2022.There are no Class 9 buildings within the proposal affected by Specification 43.

For the purposes of PBP 2019 the follow SEPPs are considered:

- The Coastal Management SEPP has been repealed and consolidated into the State Environmental Planning Policy (Resilience and Hazards) 2021,

Primitive Camping

Primitive camping is covered by the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2021.

Short-term rental accommodation

The short-term sites as per the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation allow for the installation of moveable dwellings which can include a manufactured home.

3 BUSH FIRE STRATEGIC STUDY

Planning for Bushfire Protection (2019) is based on the worst-case scenarios for each of the bush fire behaviour elements of fire weather, vegetation, slope and assumes not human intervention. All development shall be assessed on an individual basis as broad-brush approaches of documents such as PBP 2019 may not be applicable in every instance.

A Bush Fire Risk Strategic Study (BFRSS) was prepared to inform the context of the Bush Fire Assessment Report (BFAR). The level of information gathered and analysis within the BFRSS depends upon the nature and scale of the development. The BFRSS provides a broad-brush approach to determine landscape wildfire risk in considerations of vegetation continuity, distribution, and proximity to development; human intervention; access and evacuation. This enables an assessment the *actual* bushfire risk, determine if strict adherence to PBP 2019 is warranted, and if a proposed development is appropriate in the bush fire hazard context.

Table 2 *Bush fire risk strategic study*

ELEMENT	Low Threat		Moderate Threat		High Threat		Extreme Threat	
Adjoining Lands	The proposed development and changing land use will have positive impacts on the ability of adjoining landowners to implement Bush fire Protection Measures		The proposed development and changing land use do not impact on the ability of adjoining landowners to implement Bush fire Protection Measures	√	The proposed development and changing land use do not impact on the ability of adjoining landowners to implement Bush fire Protection Measures		The proposed development will significantly impact on the wildfire risk profile of adjoining lands.	
Surrounding infrastructure	The proposed development does not significantly impact on community water, electricity, or gas services.		The proposed development is associated with community water, electricity, or gas services but will not have significant impact.	√	The proposed development impact on community water, electricity, or gas services.		The wildfire risk profile of significant infrastructure will increase due to this development.	
Emergency services	The proposed development does not significantly impact on the ability of emergency services to plan, prepare, respond, or recover prior, during or after a bush fire event.		The proposed development is located within 30-minute flight from a Large Air Tanker (LAT) airbase and within 30-minutes of multiple fire response units.	√	The proposed development is located more than 30-minute flight from a Large Air Tanker (LAT) airbase and only 1 or 2 fire response units within 30-minutes.		It is unlikely emergency services will respond to wildfire in this location during extreme and catastrophic events.	

ELEMENT	Low Threat		Moderate Threat		High Threat		Extreme Threat	
Access	Good, multiple route evacuation is possible and connects with the public road network in a direction away from the wildfire threat to shelter location.		More than one access or egress routes is provided from the property to a safer location which then can access the public road network with multiple access/egress routes o shelter location.	√	One access or egress routes is provided, which is <200m from the property to a safer location.		Only one access or egress route with no nearby safe location.	
Emergency egress	Seamless integration with existing settlement - no effect on evacuation.		Short bushland pinch points that may restrict access temporarily or carry fire across roads. Unlikely impact on evacuation.	√	Pinch points that are likely to restrict access along evacuation routes for short periods (15-30mins) and carry fire across roads.		Large areas of bushland or multiple pinch points along evacuation routes that could block evacuation routes for an extended time.	
Vegetation continuity	Forested vegetation beyond 140m form the site is scattered with low continuity due to built development.		Forested vegetation beyond 140m form the site is scattered and isolated, forming a dominate fast moving grassland and open woodland fire event.		Patches of forested vegetation associated riparian and isolated ridgelines beyond 140m from the site may result in localised fire event.	√	Continuous forested areas within mountainous terrain beyond 140m from the site will result in broadscale landscape emergency management operations.	
Vegetation connectiveness	Forested vegetation corridors beyond 140m are restricted and do not enable landscape fire to enter and move through the site by a continuous fire path.		Forested vegetation corridors beyond 140m from the site exist, although grasslands >100m provide separations between forested vegetation restricting the fire head progression of landscape fire.		Forested vegetation corridors beyond 140m from the site exist, although grasslands <100m provide separations between forested vegetation restricting the fire head progression of landscape fire.	√	Forested vegetation corridors beyond 140m from the site provide for passage of landscape fire to enter and move through the site.	
Vegetation Location	Wildfire can only approach from one direction surrounded by a suburban, township or urban area managed in a minimum fuel condition.		Wildfire can only approach from two directions and the site is within a suburban, township or urban area managed in a minimum fuel condition.		Wildfire can approach from several directions although gaps within forested vegetation or are present.	√	Wildfire can approach from several directions and have hours or days to grow and develop before impacting and/or site is surrounded by unmanaged vegetation.	
Separation	Hazard separation between extreme wildfire hazard and buildings of greater than 100m.		Hazard separation between extreme wildfire hazard and buildings of 50-100m		Hazard separation between extreme wildfire hazard and buildings of 30-50m		Hazard separation between extreme wildfire hazard and buildings of <30m	√

ELEMENT	Low Threat		Moderate Threat		High Threat		Extreme Threat	
Vegetation flammability	Within the dominated fire direction, the fire fuel is restricted to surface, partially managed and separated through land use practises.		Within the dominated fire direction, the fire fuel is highly aerated, with significant separations (>50m) between these patches with partially managed vegetation between.		Within the dominated fire direction, the fire fuel is highly aerated, with <50m between these patches with partially managed vegetation between		Within the dominated fire direction, the fire fuel is highly aerated, continuous continuity vertically and horizontally with flammable species.	√
Wildfire Behaviour	Extreme Wildfire behaviour at the site is not possible given the broader landscape.		Extreme Wildfire behaviour at the site is unlikely given the broader landscape.		Extreme Wildfire behaviour at the site is likely given the broader landscape.	√	Extreme Wildfire behaviour at the site is very likely given the broader landscape.	
TOTAL					**Wildfire provides HIGH threat to this proposal**	√		

Where a **HIGH** threat is determined strict compliance with PBP 2019 is warranted. In these cases, meeting the broad aims and objectives and the specific objectives of rural residential infill and increased residential developments of PBP 2019 through providing separation between the wildfire threat and building, strict application of bushfire construction measures with access and water supplies to facilitate emergency management is required.

4 BUSH FIRE HAZARD ASSESSMENT

This section details the site assessment methodology in Appendix 1 of PBP2019 and includes the requirements of s44 of the RF Regs. It provides detailed analysis of the vegetation, slope, vegetation exclusions and downgrades to quantify the required Bush fire Protection Measures (BPMs).

4.1 FIRE DANGER INDEX

This assessment utilises Mid-Coast Council area with a FFDI 80.

4.2 ASSESSMENT METHODOLOGY

The assessment of the vegetation, slope and other bush fire characteristics within and surrounding the site has been carried out with the aid of the following:

- Nearmap, sixmap aerial photograph interpretation.
- Kogan 6*25 laser distance finder.
- Photo theodolite application supported by contour and LiDAR DEMs terrain profiles.
- SEED Portal - Sharing and Enabling NSW Environmental Data portal.
- Reference to regional vegetation community mapping, and
- Site assessment in August 2023.

4.3 VEGETATION ASSESSMENT

In accordance with PBP 2019, an assessment of the vegetation over 140m in all directions from the building was undertaken. Consideration is provided to any clearing, re-vegetation or landscaping likely to occur to obtain the worst-case scenario and derived maximum fuel loads.

Vegetation that may be considered a bush fire hazard was identified and classification based on available fuel loads for sub-formations are provided through vegetation fuel monitoring project administered by the University of Wollongong, University of Melbourne and CSRO Ecosystems Science and Bush fire Dynamics and Applications. The results of this research are commonly referred to as the '*NSW Comprehensive Fuel Loads'*.

Stream order watercourses (Strahler system - *Water Management (General) Regulation 2018*) have been identified within the 140m assessment area. This vegetation is not proposed to be impacted by bushfire protection measures.

The area is identified within the Areas of Regional Koala Significance (ARKS).

Biodiversity Development Assessment Report completed by Anderson Environmental Planning for the proposed caravan park at Lot 110 DP 1091944 and Lot 1 DP 1091944 at 3540 The Lakes Way, Charlotte Bay in March 2024 has been completed. **Figure 3, page 13** from this report is provided below.

4.3.1 Vegetation classification, exclusions, and downgrades

An analysis of the vegetation in and around the site has determined that no vegetation exclusions or down grades are included in this assessment**.**

The existing vegetation between the proposed development and The Lakes Way is illustrated in **Plate 5** and **6, page 42.** The ground and shrub layer of this vegetation is proposed to be maintained to <10cm height and not form a bushfire threat, although the canopy density will remain >15%.

Biodiversity Development Assessment Report completed by Anderson Environmental Planning for the proposed caravan park at Lot 110 DP 1091944 and Lot 1 DP 1091944 at 3540 The Lakes Way, Charlotte Bay in March 2024 indicates the vegetation in and around the site as PCT 4020 - Coastal Creekflat Layered Grass-Sedge Swamp Forest; PCT 3435 - Hunter Coast Lowland Flats Damp Forest; PCT 4020 - Coastal Creekflat Layered Grass-Sedge Swamp Forest with small areas of PCT 3435 - Hunter Coast Lowland Flats Damp Forest and non-native vegetation**.**

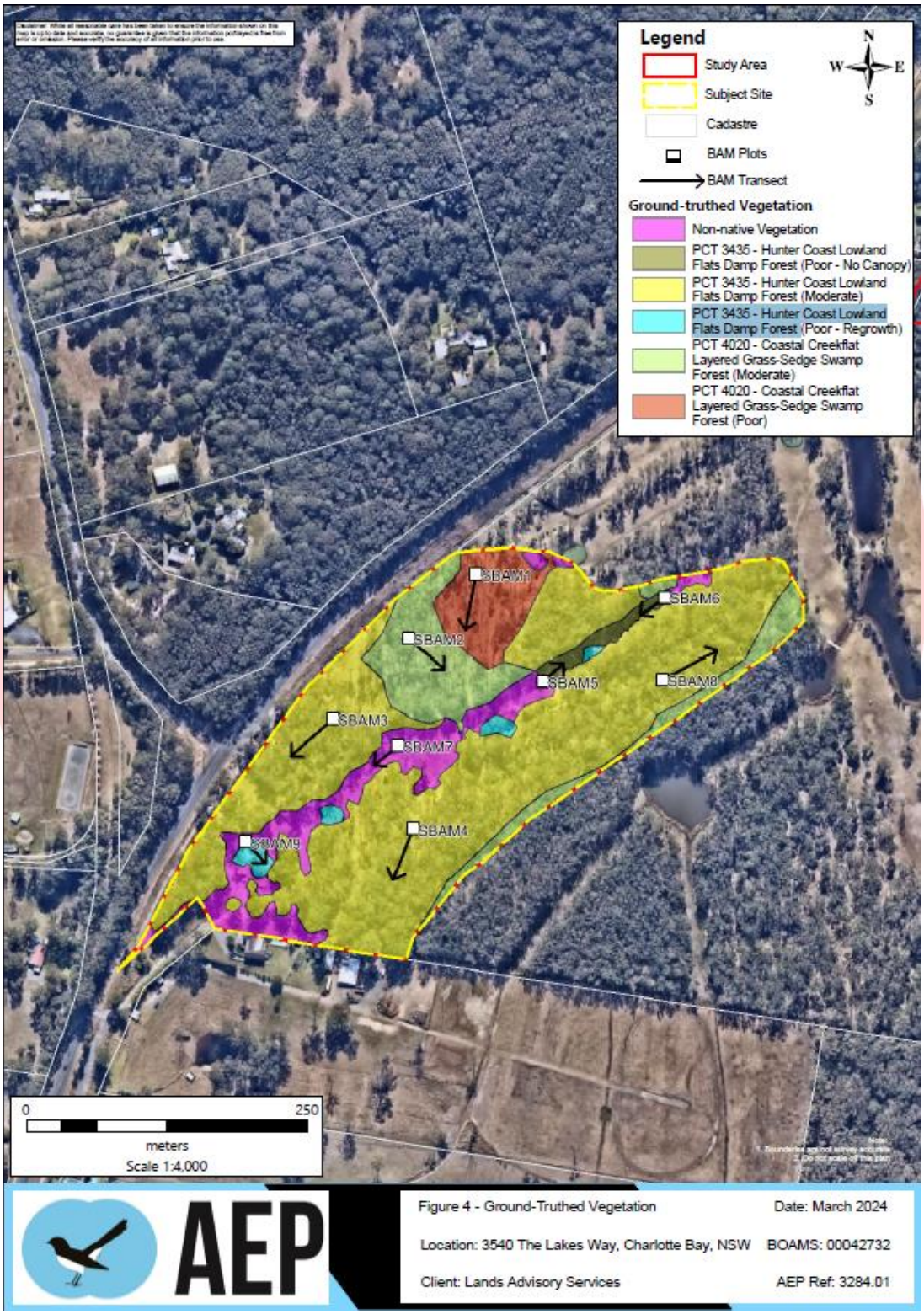

Figure 3 *Vegetation in and around the site (Extract figure 4 AEP Biodiversity report)*

4.3.2 Predominant Vegetation Classification

Vegetation in and around the site is classified *Forest* in accordance with PBP2019.

4.4 Separation Assessment

The separation between the proposed building envelope and the classifiable vegetation that creates bush fire threat is one of the significant BPMs to reduce the risk of bush fire impacting on the development. The land within the separation must conform to the standards of an Asset Protection Zone (APZ) to be accepted within the separation areas.

The separations between the classifiable vegetation and the proposed dwellings are provided in **Table 3, page 19,** illustrated in **Figure 2, page 10.**

4.5 Slope Assessment

This section details the site assessment methodology in Appendix 1 of PBP2019 to assess the effective slope (under classified vegetation) and site slope (slope between the vegetation and proposed development) within 100m of the proposed building envelope.

The effective and site slopes used within this assessment are provided in **Table 3 page 19**, illustrated in **Figure 2, page 10**.

4.5.1 Effective and Site Slope Assessment

The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux.

The effective slope is the slope of the ground under the hazard (vegetation). The slope between the vegetation and the proposed building envelope is the site slope. When identifying the effective and site slopes, it may be found that there are a variety of slopes covering different distances. The effective slope is the slope under the vegetation which will most significantly influence the bush fire behaviour for each aspect.

The topography of the site and surrounds has been assessed to identify the maximum slope present under the classified vegetation (hazard). Slope data has been calculated from a 1m LiDAR Digital Elevation Model (DEM). The source data sets have been captured to standards that are generally consistent with the Australian ICSM LiDAR Acquisition Specifications with require a fundamental vertical accuracy of at least 0.30m (95% confidence) and horizontal accuracy of at least 0.80m (95% confidence). The slope arrows indicated in **Figure 4, Page 19** represent the slope calculated across the length of the arrow utilising LiDAR data within ERSI software. These values help determine the vegetation that poses a bush fire threat and significantly influences fire behaviour. **Figure 4** illustrates the analysis of the LiDAR DEMs terrain profiles to determine the slope of the potential fire runs towards the site.

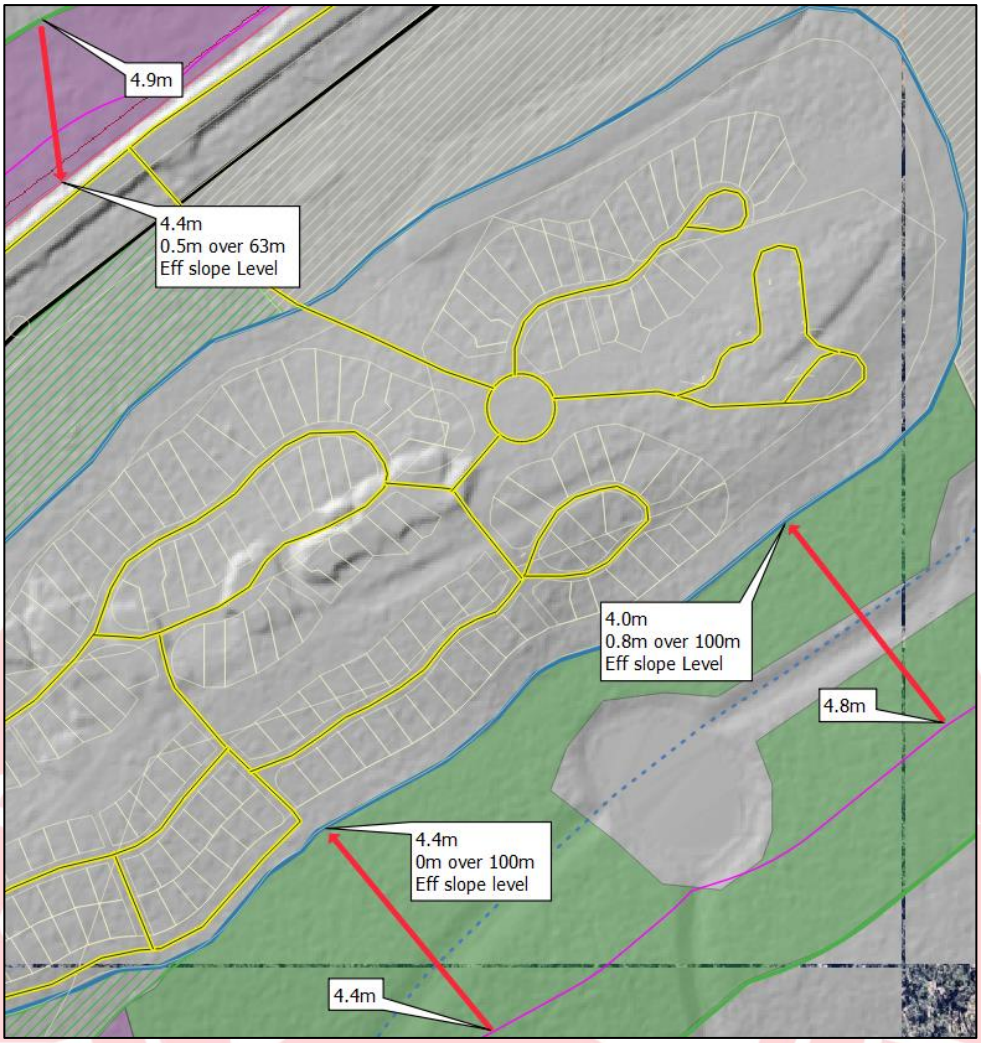

Figure 4 *LiDAR 1m DEMS slope analysis*

Outcomes of the Bushfire Attack Level assessment implementing Method 1 PBP 2019 are outlined in **Table 3, below**.

Table 3 *Outcomes for the property with respect to Bush fire Hazard Assessment (Method 1 PBP 2019)*

Elements	Method (unit)	Fire Run 1
Vegetation	NSW Comprehensive Fuel Loads	Forest
Provided Separation	Site -Laser finder (m)	Various
Effective slope	Site visit – Theodolite (°)	Level
Fire Danger Index	Council Area	80
OUTPUTS Table A1.12.6		
BALFZ		<15m
Separation to Achieve BAL40		15m-<20m
Separation to Achieve BAL29		20m-<29m
Separation to Achieve BAL19		29m-<40m
Separation to Achieve BAL12.5		40m-<100m
Separation to Achieve 10kW/m^2 at 1200K at FFDI 100		67m

5 ADDITIONAL S. 45 REQUIREMENTS

S. 45 of the RF Reg indicates the assessment requirements for s 100B RF Act developments to obtain a bush Fire Safety Authority. This section illustrates the remaining elements identified within S. 45 of the RF Reg that are not covered within bush fire hazard assessment process (section 3 and 4 of this report) or within the performance criteria of PBP 2019 (section 6 of this report).

5.1 CL (2) (E) AND (F) S.45 RF REGS - THREATENED SPECIES, POPULATIONS AND COMMUNITIES

A search on the NSW Government Central Resource for Sharing and Enabling Environmental Data for significant environmental values was completed.

Biodiversity Development Assessment Report completed by Anderson Environmental Planning for the proposed caravan park at Lot 110 DP 1091944 and Lot 1 DP 1091944 at 3540 The Lakes Way, Charlotte Bay in March 2024 ha assessed the threatened species, populations, and communities.

A search of the Aboriginal Historic Information Management System (AHIMS) was completed on the 8th August 2023 which indicated the development area is not known to have any Aboriginal significance.

The output of the search is provided in **Appendix 5, page 45.**

There will be no additional impacts on cultural heritage values**.**

5.2 CL (2) (G) ADDITIONAL BUSH FIRE ASSESSMENT

The capacity of nearby public roads to handle increased volumes of traffic when a bush fire emergency occurs.

The surrounding public road system is two-way, sealed with multiple routes to safer places away from the bush fire threat. This designed will be able to accommodate the elevated level of traffic created by this development.

Whether or not nearby public roads that link with the fire trail network have two-way access.

No linkages between the public road system and fire trails exist within the assessment area.

The adequacy of sprinkler systems and other fire protection measures to be incorporated into the development.

There are no bushfire spray systems or fire protection measure proposed outside the performance criteria for subdivisions.

Registered fire trails on the property.

No registered fire trails are located on the property.

6 BUSHFIRE ASSESSMENT AND PERFORMANCE MEASURES

This section assesses Bushfire Performance Measures (BPMs) for the proposed development at The Lakes Way, Charlotte Bay, NSW in consideration of the acceptable solutions required for each performance criteria within PBP 2019. Outcomes are outlined in Table 4, below. Where acceptable solutions are not met details of the performance-based solution are provided.

Table 4 *Planning for bush fire protection compliance (PBP 2019*) – Chapter 6 - *Special Fire Protection Purpose (SFPP) developments on bush fire prone lands.*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION	COMPLIANCE for The Lakes Way, Charlotte Bay, NSW
APZs	Radiant heat levels of greater than 10kW/ m² (calculated at 1200K) will not be experienced on any part of the building.	• The building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1.	**COMPLIES - ACCEPTABLE SOLUTION** A >67m APZ is provided in accordance with Table A1.12.1. Refer to variation for primitive camping and glamping along the eastern boundary of the proposed development. The clubhouse is >500m^2 public assembly and does not meet the 10kW/m2 radiant heat separation. The club house is exposed to <19kW/m2 with a 32m separation. All short-term sites are located in areas exposed to <10kW/m^2 radiant heat exposure. Within stage 21 a 67m temporary APZ shall be established with within future stage 2. Within stage 2, a 67m temporary APZ shall be established with within future stage 3. A suitably worded instrument, pursuant to section 88 of the Conveyancing Act 1919, shall be established for the provision of temporary asset protection zone (APZ) in accordance with this

			report. The name of authority empowered to release, vary, or modify the instrument shall be Mid Coast Council. The temporary APZ shall extinguish once the CC has been issued for future stages.
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	• APZs are located on lands with a slope less than 18 degrees.	**COMPLIES - ACCEPTABLE SOLUTION** The APZ on this site is wholly within the site boundaries and is not located on land >18 degrees slope.
	APZs are managed and maintained to prevent the spread of fire to the building.	• The APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site.	**COMPLIES - ACCEPTABLE SOLUTION** The APZ on this site is wholly within the site boundaries. The tree density of the vegetation between the development and The Lakes Way to the west, and between the development and private property to the south is > than 15% **(Plate 5 and 6, page 42).** The shrub and ground cover Under this tree density is currently managed. Together with the separation offered by The Lakes Way and the residential development, this level of clearance and ongoing management beneath the canopy will not support canopy fire. **Appendix 6 page 46** provides analysis to illustrate canopy removal is not required to meet the objectives of PBP and provides a positive outcome (capturing embers prior to them reaching the development) an no tree removal is required.
	The APZ is provided in perpetuity.	• APZ are wholly within the boundaries of the development site; and • Other structures located within the APZ need to be located further than 6m from the refuge building.	**COMPLIES - ACCEPTABLE SOLUTION** The APZ is not wholly within the site boundaries, although complies with section 3.2 of PBP 2019 and is not located on land >18 degrees slope.
	VARIATION: Camping and primitive camping: no performance criteria applicable.	• N/A	**COMPLIES - ACCEPTABLE SOLUTION** Asset Protection Zones are not required for Camping and primitive camping.

CONSTRUCTION	The proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	• A construction level of BAL-12.5 or greater under AS 3959 and section 7.5 of PBP is applied.	**COMPLIES - ACCEPTABLE SOLUTION** The proposed club house is provided a BAL 19 separation, although a BAL 29 construction standard will be applied in accordance with AS 3959 or NASH Standard and section 7.5 of PBP 2019. All cabins and tiny houses are located in areas exposed to <10kW/m2 radiant heat exposure. Cabins and tiny houses located within 100m of the bushfire treat (illustrated in **Figure 2, page 9**) shall be constructed to BAL 12.5 construction level in accordance with AS 3959 or NASH Standard and section 7.5 of PBP 2019.
	VARIATION: Camping and primitive camping: No performance criteria applicable.	• N/A	**COMPLIES - ACCEPTABLE SOLUTION** Construction Levels are not required for Camping and primitive camping.
ELECTRICITY	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; 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.	**COMPLIES - ACCEPTABLE SOLUTION** All electricity services are placed underground. OR The existing electrical supply to the local area is via overhead electrical transmission. Periodic inspection should be undertaken to ensure the lines into the private property are not fouled by the growth of trees. Landscaping and vegetation should be maintained to comply with Energy Australia 'Vegetation Safety Clearances' (NS179, April 2002).
GAS	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.	**COMPLIES - ACCEPTABLE SOLUTION** Any reticulated or bottled gas shall be installed and maintained in accordance with the below requirements as outlined in Table 7.4a of PBP:

		• 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. • 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; • Polymer-sheathed flexible gas supply lines are not used; and • Above-ground gas service pipes are metal, including and up to any outlets	•Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used. •All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. •Connections to and from gas cylinders are metal. •Polymer-sheathed flexible gas supply lines are not used; and •Above-ground gas service pipes are metal, including and up to any outlets.
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.	• Landscaping is in accordance with Appendix 4; and • Fencing is constructed in accordance with section 7.6.	**MADE CONDITION OF CONSENT** A landscaping plan is required to illustrate: •The ongoing maintenance of the shrub and ground vegetation between the development and The Lakes Way to the west, and between the development and private property to the south to ensure no shrub vegetation is established or allowed to grow and grasses are maintained <10cm in height. No tree removal is required in this area. •Within the development area (blue outline on **Figure 2, page 10**): •Tree density shall be <30% and shrubs vegetation not located under tree canopy. •1.5m separation is provided between the building-to-shrub/garden vegetative fuels with a smooth ground surface within this separation immediately adjacent to buildings. •No flammable rough ground surfaces (bark/mulch gardens beds) within 6m of the building, stairs, or decks. •

ACCESS (GENERAL) REQUIREMENTS)	Firefighting vehicles are provided with safe, all-weather access to structures and hazardous 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.	**MADE CONDITION OF CONSENT** • 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
	VARIATION: Primitive camping: Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	• Access is provided in accordance with the property access requirements of Table 5.3b.	**Refer to TABLE 5.3b PROPERTY ACCESS:** Firefighting vehicles can access the dwelling and exit the property safely.
	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.	**MADE CONDITION OF CONSENT** 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
	There is appropriate access to water supply	• 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.	**MADE CONDITION OF CONSENT** 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. There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

PERIMETER ROADS	Perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	• Are two-way sealed roads. • Minimum 8m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width. • Hydrants are located clear of parking areas. • 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.	**PERFORMANCE SOLUTION** Due to the low bushfire treat and separation provided, a fire trail will be provided around the perimeter of the that will meet private property access requirements.
NON-PERIMETER ROADS	Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	• Minimum 5.5m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width. • Hydrants are located clear of parking areas. • Roads 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.	**MADE CONDITION OF CONSENT** All roads no constructed to private property standard shall be constructed to non-perimeter road requirements. • Minimum 5.5m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width. • Hydrants are located clear of parking areas. • Roads 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.

PROPERTY ACCESS	**TABLE 5.3b PROPERTY ACCESS: Only required for variations** Firefighting vehicles can access the dwelling and exit the property safely.	• 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. In circumstances where this cannot occur, the following requirements apply: • Minimum 4m carriageway width. • In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay. • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. • Provide a suitable turning area in accordance with 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 access by dedication of a road and not by right of way.	**MADE CONDITION OF CONSENT** Perimeter road and road network throughout camping areas (as illustrated in **Figure 2, page 10**) shall comply with private property access: • Minimum 4m carriageway width. • In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay. • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. • Provide a suitable turning area in accordance with 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 access by dedication of a road and not by right of way. *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.*

WATER SUPPLIES	Adequate water supplies is provided for firefighting purposes in installed and maintained.	• Reticulated water is to be provided to the development where available, OR • A 10,000 litres minimum static water for firefighting purposes is provided for each occupied building where no reticulated water is available.	**MADE CONDITION OF CONSENT** Reticulated water supplied for firefighting purposes.
	VARIATION to above only: Caravan and camping grounds/ Primitive camping: An adequate water supply for firefighting purposes is installed and maintained.	• Either a reticulated water supply is provided or a 10,000 litres minimum water supply on site.	**COMPLIES - ACCEPTABLE SOLUTION** Reticulated water supplied for firefighting purposes.
	Water supplies are located at regular intervals. The water supply is accessible and reliable for firefighting operations.	• Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021; • Hydrants are not located within any road carriageway; and • Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.	**MADE CONDITION OF CONSENT** • Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021; • Hydrants are not located within any road carriageway; and • Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.
	Flows and pressure are appropriate	• Fire hydrant flows and pressures comply with Table 2.2 of AS 2419.1:2021.	**N/A** This report has not tested or determined if the fire hydrant flow and pressures to comply with Table 2.2 of AS 2419.1:2017.
	The integrity of the water supply is maintained.	• All above-ground water service pipes are metal, including and up to any taps.	**MADE CONDITION OF CONSENT** All above-ground water service pipes are metal, including and up to any taps.
	Water supplies are adequate in areas where reticulated water is not available	• A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; a 65mm Storz outlet with a ball valve is fitted to the outlet. • Ball valve and pipes are adequate for water flow and are metal. • Supply pipes from tank to ball valve have the same bore size to ensure flow volume. • Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank.	**N/A** Reticulated water supplied for firefighting purposes.

		• A hardened ground surface for truck access is supplied within 4m of the access hole. • Above-ground tanks are manufactured from concrete or metal. • Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F AS 3959). • Unobstructed access is always provided. • Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; and • Underground tanks are clearly marked. • All exposed water pipes external to the building are metal, including any fittings. • Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump and are shielded against bush fire attack, any hose and reel for firefighting connected to the pump shall be 19mm internal diameter. • Fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels and installed in accordance with the relevant clauses of AS 2441:2017 Installation of fire hose reels.	
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.	**MADE CONDITION OF CONSENT** There are no bush fire emergency procedures for the proposed development. A Bush Fire Emergency Management and Evacuation Plan is prepared that complies with the requirements of Table 6.8d within PBP2019 prior to the issuing of an occupation certificate. The Bush Fire Emergency Management and Evacuation Plan shall: • Be provided to the Local Emergency Management Committee for its information prior to occupation of the development. • Be consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan. • Be consistent with Australian Standard AS 3745:2010 Planning for emergencies in facilities; and

		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	• A Emergency Planning Committee is established to consult with staff in developing and implementing an Emergency Procedures Manual. • Detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted. • Consider the amount of travel likely to be generated during an emergency evacuation; the capacity of the broader road network to facilitate safe emergency evacuation; limitations/constraints inherent in the road system; and management of potential traffic conflicts (such as emergency vehicles versus evacuating members of the public).
	VARIATION to above only: **Caravan and camping grounds:** A Bush Fire Emergency Management and Evacuation Plan is prepared. **VARIATION to above only:** **Primitive camping:** A Bush Fire Emergency Management and Evacuation Plan is prepared.	• A Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and AS 3745:2010. • For proposals in isolated or remote areas which involve large travel distances through bush fire prone vegetation, the following issues should be determined and addressed: ○ The amount of travel likely to be generated during an emergency evacuation. ○ The capacity of the broader road network to facilitate safe emergency evacuation. ○ Limitations/constraints inherent in the road system; and ○ Management of potential traffic conflicts (such as emergency vehicles versus evacuating members of the public). • The Bush Fire Emergency Management and Evacuation Plan must consider a mechanism for the early relocation of occupants on days when adverse fire weather is notified, or adverse fire activity occurs in the local government area in which the development operates.	**MADE CONDITION OF CONSENT** There are no bush fire emergency procedures for the proposed development. A Bush Fire Emergency Management and Evacuation Plan is prepared that complies with the requirements of Table 6.8d within PBP2019 prior to the issuing of an occupation certificate. The Bush Fire Emergency Management and Evacuation Plan shall: • Be provided to the Local Emergency Management Committee for its information prior to occupation of the development. • Be consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan. • Be consistent with Australian Standard AS 3745:2010 Planning for emergencies in facilities; and • Consider the amount of travel likely to be generated during an emergency evacuation; the capacity of the broader road network to facilitate safe emergency evacuation; limitations/constraints inherent in the road system; and management of potential traffic conflicts (such as emergency vehicles versus evacuating members of the public).

		Note: A copy of the Bush Fire Emergency Management and Evacuation Plan shall be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	
	Appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan.	• An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual; and • Detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.	**MADE CONDITION OF CONSENT** There are no bush fire emergency procedures for the proposed development. The Bush Fire Emergency Management and Evacuation Plan shall: •A Emergency Planning Committee is established to consult with staff in developing and implementing an Emergency Procedures Manual. •Detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.

7 CONCLUSION AND RECOMMENDATIONS

It is clear from this investigation and assessment that the site is located within Bush fire Prone Land. An assessment in accordance with Appendix 1 of PBP2019 has been undertaken. This BFAR found the classifiable vegetation of *Forest* as described by PBP 2019 level to the north-west and south-east in creates a bush fire threat.

In accordance with the provisions of PBP 2019, the recommendations outlined within this assessment will reduce the risk of damage and/or harm in the event of a bush fire event to acceptable levels. Compliance with the below recommendations can be achieved or practically implemented without substantial change to the proposed layout or construction methodology. It is recommended that development consent be granted subject to the following conditions:

Asset Protection Zones

The tree density of the vegetation between the development and The Lakes Way to the west, and between the development and private property to the south is > than 15% (**Plate 5 and 6, page 42**). The shrub and ground cover under this tree density is currently managed. Together with the separation offered by The Lakes Way and the residential development, this level of clearance and ongoing management beneath the canopy will not support canopy fire. **Appendix 6 page 46** provides analysis to illustrate canopy removal is not required to meet the objectives of PBP and provides a positive outcome (capturing embers prior to them reaching the development) an no tree removal is required.

At the commencement of building works and in perpetuity the surface, near surface and elevated fire fuels in and around the proposed development as noted in **Figure 2 page 10** of this report, be maintained to inner protection area (IPA) standards as outlined within Appendix 4 of Planning for Bush Fire Protection 2019 and the NSW RFS document Standards for Asset Protection Zones. Tree canopy density not beyond 40% coverage at maturity.

A >67m APZ is provided in accordance with Table A1.12.1. All short-term sites are located in areas exposed to <10kW/m2 radiant heat exposure.

Primitive camping and glamping along the eastern boundary of the proposed development in areas >10kW/m^2.

The clubhouse is >500m^2 public assembly and does not meet the 10kW/m^2 radiant heat separation. The club house is exposed to <19kW/m^2 with a 32m separation.

Within stage 21 a 67m temporary APZ shall be established with within future stage 2. Within stage 2, a 67m temporary APZ shall be established with within future stage 3.

A suitably worded instrument, pursuant to section 88 of the Conveyancing Act 1919, shall be established for the provision of temporary asset protection zone (APZ) in accordance with this report. The name of authority empowered to release, vary, or modify the instrument shall be Mid Coast Council. The temporary APZ shall extinguish once the CC has been issued for future stages.

Landscaping

A landscaping plan is required to illustrate:

- The ongoing maintenance of the shrub and ground vegetation between the development and The Lakes Way to the west, and between the development and private property to the south to ensure

no shrub vegetation is established or allowed to grow and grasses are maintained <10cm in height. No tree removal is required in this area.

- Within the development area (blue outline on **Figure 2, page 10**):
  - Tree density shall be <40% and shrubs vegetation not located under tree canopy.
  - 1.5m separation is provided between the building-to-shrub/garden vegetative fuels with a smooth ground surface within this separation immediately adjacent to buildings.
- No flammable rough ground surfaces (bark/mulch gardens beds) within 6m of the building, stairs, or decks.

A Landscaping plan is required to illustrate compliance with the intent of APZ standards is required for the area identified in **Figure 2 page 10**. This Landscaping plan shall be endorsed by a BPAD level 3 bushfire consultant prior to Construction Certificate stage.

Construction Standards

New construction of the tiny houses and cabins identified within 100m of the bushfire threat must comply with section 3 and section 5 (BAL 12.5) Australian Standard AS3959-2018 Construction of buildings in bush fire-prone areas or NASH Standard National Standard Steel Framed Construction in Bushfire Areas – 2021.

The club house is provided a separation to accommodate BAL 19 construction, although construction of the clubhouse must comply with section 3 and section 7 (BAL 29) Australian Standard AS3959-2018 Construction of buildings in bush fire-prone areas or NASH Standard National Standard Steel Framed Construction in Bushfire Areas – 2021.

No construction requirements for glamping or camping.

Access

All access roads shall comply with:

- SFPP access roads are two-wheel drive, all-weather roads.
- Access is provided to all structures.
- The capacity of private property access 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.
- 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.
- 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.
- There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
- 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.

Perimeter road and road network throughout camping and glamping areas (yellow and black dash line as illustrated in **Figure 2, page 9**) shall comply with private property access:

- Minimum 4m carriageway width.

- In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay.
- A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.
- Provide a suitable turning area in accordance with 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 access by dedication of a road and not by right of way.

Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), 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.

All other roads shall be constructed to non-perimeter road requirements (solid yellow and black line as illustrated in **Figure 2, page 9**):

- Minimum 5.5m carriageway width kerb to kerb.
- Parking is provided outside of the carriageway width.
- Hydrants are located clear of parking areas.
- Roads 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.

Water Supply

- All above-ground water service pipes are metal, including and up to any taps
- Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021;
- Hydrants are not located within any road carriageway; and
- Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.

Emergency Management

The Bush Fire Emergency Management and Operation Plan shall:

- Be consistent with the NSW RFS document: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*.
- Be consistent with *Australian Standard AS 3745:2010 Planning for emergencies in facilities*.
- Incorporate S.72(9) from the EP&A Regs (2021) for entertainment venues.
- Be provided to the Local Emergency Management Committee for its information prior to occupation of the development.
- Establishes an Emergency Management Committee with responsibilities for decisions identified.
- Provides decision triggers to inform when to evacuate and all potential evacuation routes.
- Provides guidance on the appropriate management actions during elevation fire danger days.
- An appropriate refuge location should also be considered if bushfire prevents evacuation.

- Consider the amount of travel likely to be generated during an emergency evacuation; the capacity of the broader road network to facilitate safe emergency evacuation; limitations/constraints inherent in the road system; and management of potential traffic conflicts (such as emergency vehicles versus evacuating staff).
- The size and age group of the existing population within the locality and the number of other SFPP facilities within the locality.
- Compartmentalises the landscape into bushfire management zones with quantifiable bushfire risk treatment identified in each zone.
- Provide monitoring schedules, and triggers to undertake management and maintenance of Bush fire protection measures.

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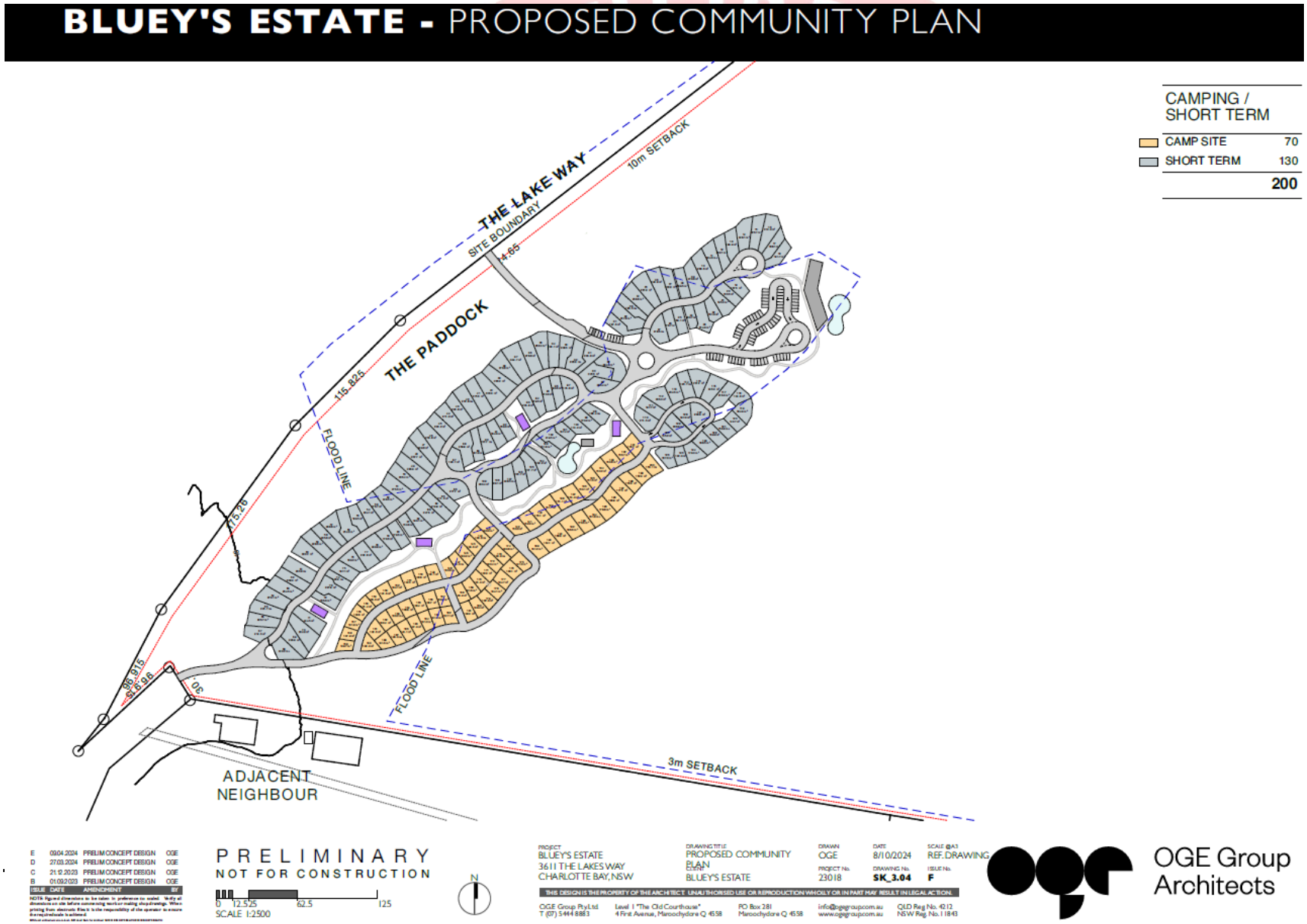
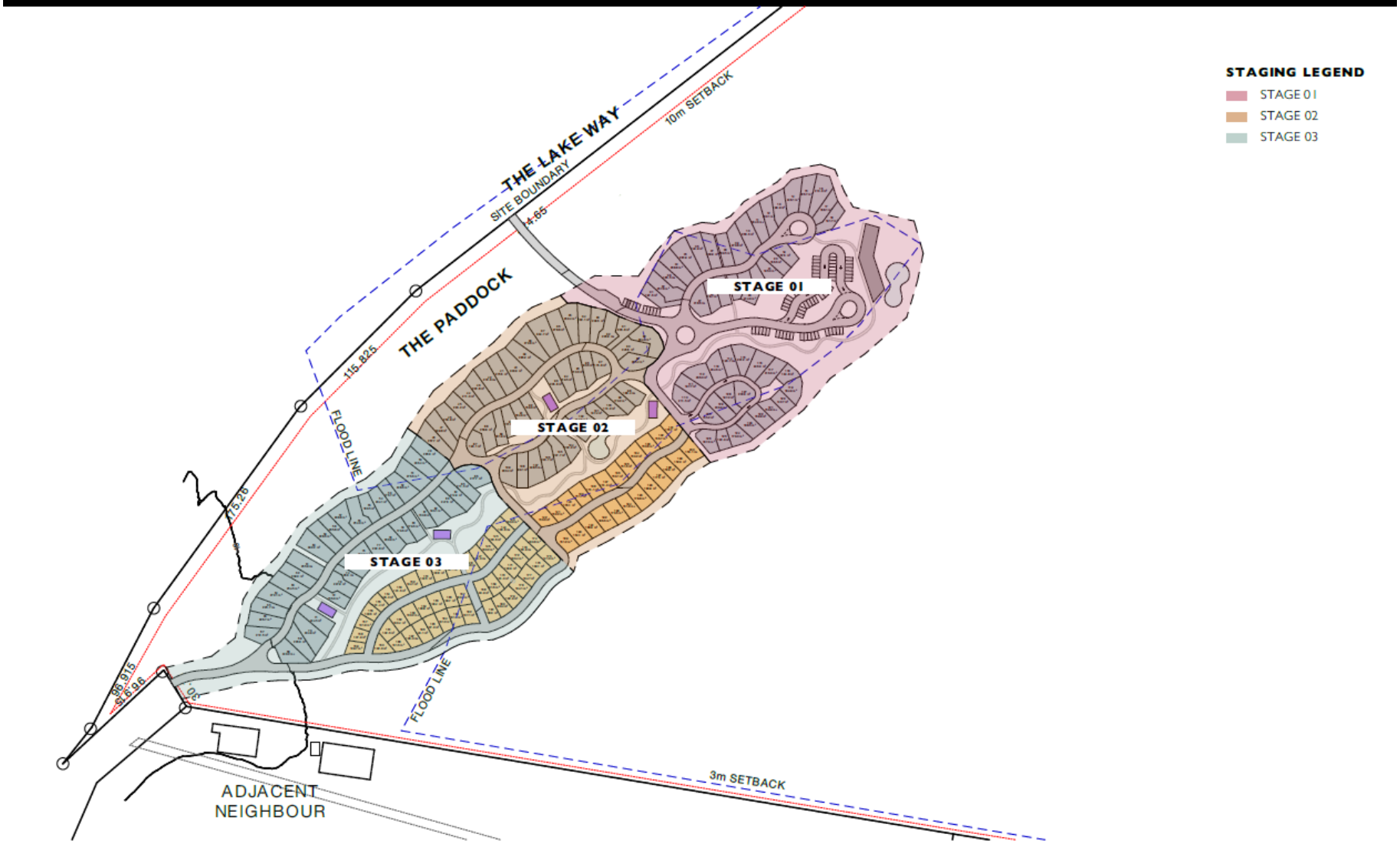
9 APPENDIX 1 DEVELOPMENT PLANS



BLUEY'S ESTATE - PROPOSED STAGING PLAN



ISSUE	DATE	AMENDMENT	BY
E	09.04.2024	PRELIM CONCEPT DESIGN	OGE
D	27.03.2024	PRELIM CONCEPT DESIGN	OGE
C	21.12.2023	PRELIM CONCEPT DESIGN	OGE
B	01.09.2023	PRELIM CONCEPT DESIGN	OGE

NOTE: Figured dimensions to be taken in preference to scaled. Verify all dimensions on site before commencing work or making shop drawings. When printing from electronic files it is the responsibility of the operator to ensure drawings are printed at the correct scale.

PRELIMINARY
NOT FOR CONSTRUCTION

0 12.5 25 62.5 125
SCALE 1:2500

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PROJECT: BLUEY'S ESTATE, 3611 THE LAKES WAY, CHARLOTTE BAY, NSW
DRAWING TITLE: PROPOSED STAGING PLAN
CLIENT: BLUEY'S ESTATE
DRAWN: OGE
DATE: 8/10/2024
SCALE @A3: REF. DRAWING
PROJECT No.: 23018
DRAWING No.: SK_3.05
ISSUE No.: F

OGE Group Pty Ltd
T (07) 5444 8883
Level 1 "The Old Courthouse"
4 First Avenue, Maroochydore Q 4558
PO Box 281
Maroochydore Q 4558
info@ogegroup.com.au
www.ogegroup.com.au
QLD Reg No. 4212
NSW Reg No. 11843

OGE Group Architects

10 APPENDIX 2 PLATES (PHOTOGRAPHS)

Plates 1 – 6 depict the elements in and around the site that are considered within the bush fire hazard assessment. The classified vegetation, separations, effective and site slope are identified in **Table 3, page 19** and displayed in **Figure 2, page 10**.

Plate 1 *(P1) Access along The Lake Way*

Plate 2 *(P2) Vegetation to the west of The Lake Way*

Plate 3 *(P3) Golf course to the north*

Plate 4 *(P4) Example of the vegetation to the south-east*

Plate 5 *(P5) Vegetation between The Lake Way and development*

Plate 6 *(P6) Vegetation between The Lake Way and development*

11 APPENDIX 3 NSW SHARING AND ENABLING ENVIRONMENTAL DATA

12 APPENDIX 4 BIODIVERSITY MAP

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Biodiversity Offset Scheme (BOS) applies to a clearing or development proposal. You can use the Threshold Tool in the map viewer to generate a BV Threshold Report for your nominated area. The report will calculate results for your proposed development footprint and determine whether or not you will need to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

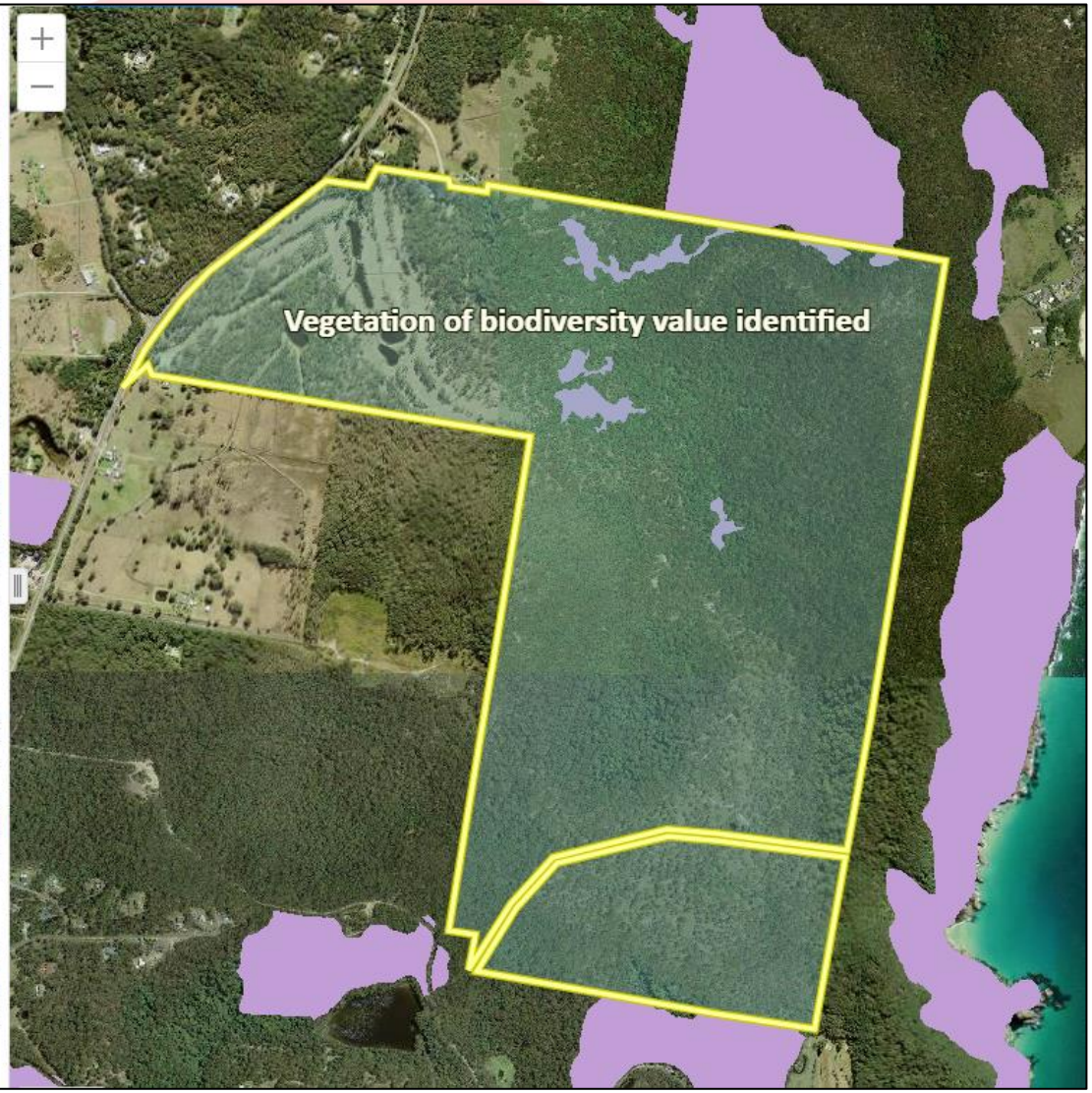
This report can be used as evidence for development applications submitted to councils, native vegetation clearing not requiring development consent in urban areas and areas zoned for environmental conservation under State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new?

For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide. or contact the Map Review Team at map.review@environment.nsw.gov.au or on 02 8000 0258.



13 APPENDIX 5 AHIMS SEARCH

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Blueys
Client Service ID : 807353

Duncan Scott-Lawson

Date: 08 August 2023

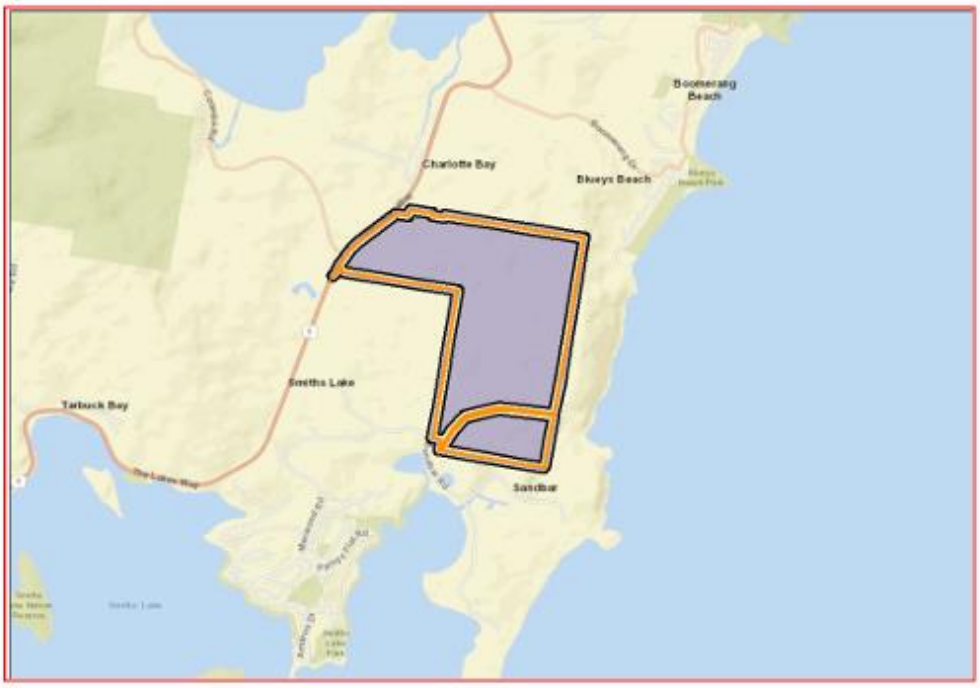
PO Box 182
Salamander Bay New South Wales 2317
Attention: Duncan Scott-Lawson

Email: duncan@emconsultancy.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 110, DP:DP1091944, Section : - with a Buffer of 50 meters, conducted by Duncan Scott-Lawson on 08 August 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

14 APPENDIX 6 APZ COMPLIANCE WITH INCREASED CANOPY

The following research was undertaken to determine the requirements to promote and sustain canopy fire in consideration of the canopy density within the OPA of the proposed design.

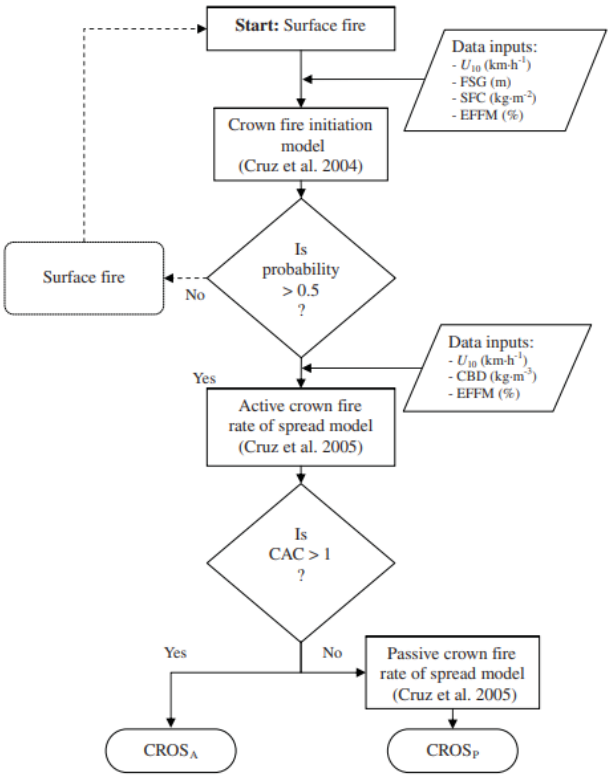
Crown fires are normally originated from surface fires spreading either along the bark of the tree trunks or direct flame contact to low branches with leaves and needles (Moinuddin and Sutherland, 2020). Ruiz-González and Álvarez-González (2011) defines three limiting factors (surface fire intensity, horizontal heat flux, and spread rate) and two stages in the process (initiation and propagation) and also established three different classes (passive, active, and independent) of crown fire. In this analysis the assumption is an active crown fire is progressing towards the site from the west and threatening to burn into the provided APZ (tree density at maturity).

The minimum conditions necessary to initiate and propagate crown fires are assumed to be strongly influenced by the stand structural variables canopy bulk density (CBD) and canopy base height (CBH) (Ruiz-González and Álvarez-González, 2011) although Scott and Reinhardt (2001) report the lack of continuity from surface to canopy fuel stratum and also the available fuel for combustion in the aerial layer are critical for the continuation of canopy fire. Cruz *et al.* (2003) indicated that CBH (surface to canopy fuel stratum) is the vertical distance between the surface and the live canopy fuel layer and Pimont etal (2008) report radiative transfer (ground to canopy) is one of the most important heat transfers involved in fire propagation. This is supported by Moinuddin and Sutherland (2020) who suggest the requirements for heat release rate of a surface fire propagates under the crown fire and supplies energy to support the burning of the crown and surface fires have a well-defined frontal location (the contour of boundary temperature at the surface where pyrolysis will commence). Crown fires do not have such a well-defined frontal location due to the spatial heterogeneity and diffuse nature of the fuel within the canopy.

Moinuddin and Sutherland (2020) reports the crown fire is supported by the surface fire. The ability of the fire to emitted thermal energy being transmitted through the canopy gaps is dependent on the heat from the surface fire. The fire, after the crown fire is established, has quasi-steady heat release rate which is dependant on the heat release rate of the surface fire, which is dependent on surface and elevated fuel load, and the canopy base height.

Cruz *et. al,* 2005 reports thresholds canopy base height and canopy bulk density are necessary for crowning fires and that even under severe burning conditions active crown fire spread is not possible. Cruz and Alexander (2006) provide the following flow chart for predicting crown fires, significantly to presence of a surface fire is critical to the ongoing crown fire and is identified as a trigger for crown fire propagation. This is also supported by Dupuy and Morvan (2005).

Thomas *et al.* (2015) examined the foliage shape and size coupled with distribution within the canopy are important theoretical factors affecting crown fire rate of spread. Canopy fuels has been researched by the University of Wollongong - Centre for Environmental Risk Management of Bushfire although is limited to Dry and Wet Sclerophyll forest, not forested wetland (Keith Class) that are present within the site. Literature review completed by the author for this report found no data on the leaf mass per unit area (LMA) or the canopy bulk density (CBD) of *Melaluca quinqenervia*.



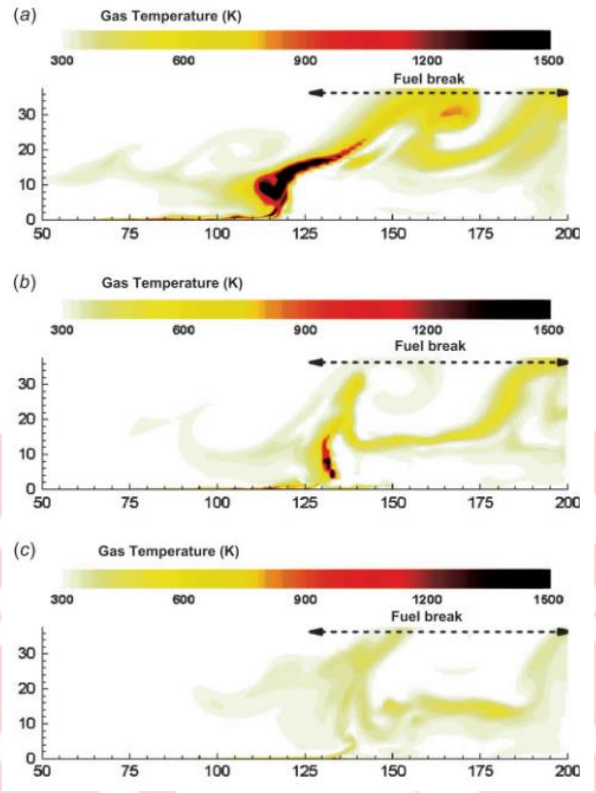
Extract from Cruz and Alexander 2006 - Figure 1

Moinuddin and Sutherland (2019) reports Crown fires originated from surface fires spreading either along the bark of the tree trunks or direct flame contact to low branches with leaves, transitioning from a forest floor fire to a crown fire leading to a quasi-steady rate of spread after an initial development period. Dupuy and Morvan (2005) examined the effect of fire breaks on canopy fires and found within the canopy of the fire break thermal degradation of the canopy fuel appeared several metres in front of the main fire front, through flame tilt supported by wind velocities, where only half of the canopy biomass was consumed prior to the canopy fire falling out due to the lack of supportive convectional heat by burning ground and shrub fuels is an extract from illustrates Dupuy and Morvan (2005) illustrating the temperature field of the gas of a crown fire towards a fire break.

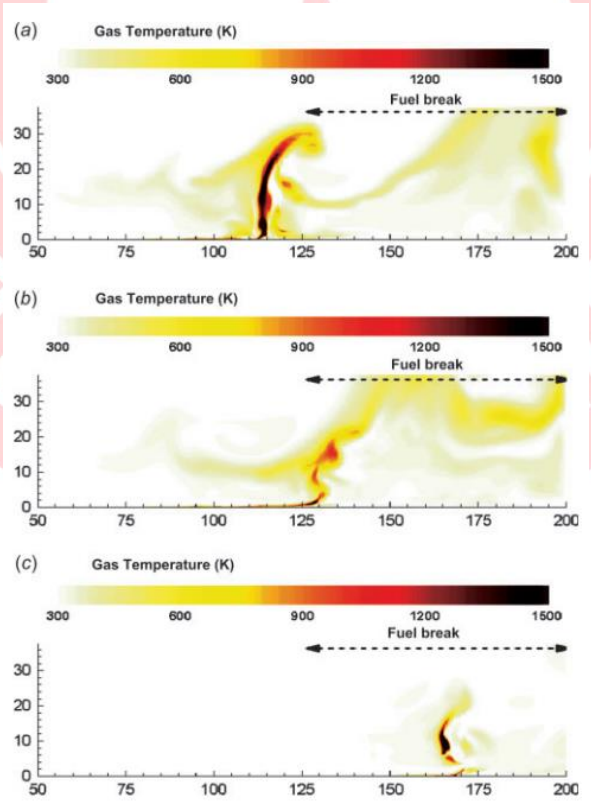
The treatment of the fire break with no change to canopy density and surface fuel volumes were at 400m^3/ha (5cm ground fuels and 3m base canopy height). Canopy density was reduced to 25% and surface fuel volumes were at 2800m^3/ha (shrub layer managed to 35cm height) are illustrate in the following figures.

This research that demonstrated how quickly (within 10m) the fire falls out of the canopy on arrival to a fire break, although canopy scorching continues. The critical outcome of this research is that the canopy fire will progress into the APZ for a short distance (approx. 10m) before dropping out of the canopy and the most important factor is the ground and shrub growth volumes not the canopy density.

It is noted that the surface fuel volumes were at 400m^3/ha, where in the proposed design the surface fuel volumes are approaching 0m^3/ha providing further redundancies in the potential fire behaviour.



Temperature field of the gas (no canopy management with 400m³/ha surface and elevated fuel management)



Temperature field of the gas (Canopy management to 25% with 2800m³/ha surface and elevated fuel management)

It is commonly accepted that a ground-based fire within the surface, near surface and elevated fuels are required under a canopy with canopy bulk density and canopy base height above thresholds to provide buoyant plume dynamics for canopy fire to propagate. Once the energy transfer (gain) from the surface fire into the crown is lost (through the removal of surface, near surface and elevated fuels) the crown fire can no-long propagate and falls out of the canopy (Cruz *et. al.* 2006).

Ignition within APZ potential

A landscape fire in the surrounding unmanaged vegetation will create ember/fire brands that may land within the APZ and start a spot fire. For the spot fire to grow, fuel conditions need to assist the growth and a series of favourable fire growth parameters need to be achieved. These parameters include the fuel dryness; amounts of ground fuel, near-surface fuels, elevated fuel, base canopy height; adequate canopy density and wind velocities.

The site has actively growing grasses, minimum debris (leaf and twig) and no near-surface fuels, elevated fuels with a basal canopy height of 5-8m.

Development of fire from an ember (point ignition) involves a growth stage prior to reaching equilibrium state which will spread at a reduced rate, resulting in less energy release, shorter flames and reduced radiant heat exposure.

Existing empirical models (used within bushfire) focus on equilibrium rate of spread within bushfire fire behaviour with limited consideration of fire growth. The growth phase to have critical importance (Sullivan *et al*.,2014) as there are a range of factors required to support this stage and wildfire suppression is effective during this stage.

Planning legislation uses design fires for a fully established fire which can result in unnecessary construction expense and ecological impact due to design fires that do not consider the growth stage (Ecological impacts are principle to this project). Chandler *et al.* (1983) supports this identifying that fire prediction systems should be used with caution in the initial stages of a fire since they will over predict spread rates and do not provide for increasing fire intensity.

Gould et al. (1996) testing the actual rate of spread of point ignitions of summer fires in dry sclerophyll forest with a 50 percent canopy cover for a medium to high intensity fire against modelled rate of spread calculations and found the modelled rate of spread to be 6 to 9 times greater than the actual, providing adequate redundancies in the modelling.

Gould *et al*. (2007) and Sullivan *et al*. (2014) analysis the time for a fire growth in Australia forest to reach equilibrium rate of spread, resulting in 45mins or several hours for growth from spot ignition.

A spot ignition within the proposed APZ would not be able to grow to a canopy fire due to the lack of surface, near-surface and elevated ladder fuels required to enable canopy fire growth. Furthermore the time period required for this growth will most likely be impeded due to human intervention as fire hydrants have been placed through the APZ/building interface to support suppression operations.

16 APPENDIX 7 BUSHFIRE PROTECTION MEASURES AND INFORMATION

The following information on building survivability and the application of Bushfire Protection Measures should be considered continually for the life of the development. These measures facilitate meeting the aims and objectives of PBP 2019 and mitigating bushfire risk and are provided to inform the client.

Why do buildings burn during bush fires?

Research has been undertaken to over the last decades to analysis and determine the elements that determine the survivability of a building during a bush fire event. As the research is validated, these elements are incorporated into planning documentation that guides construction in bush fire prone areas, such as Australian Standard 3959 and NSW RFS Planning for Bushfire Protection.

Research has illustrated that there are three ways a bush fire impacts a building:

1. Direct flame contact,
2. Radiant heat from the bush fire, and
3. Embers generated by the bush fire.

Most people expect direct flame contact to be the biggest risk to homes in a bush fire, but this is not the case. Over 80% of house loss during bush fires occurs because of ember attack; the burning firebrands of bark, leaves and twigs with winds drive away from the main fire front. They find weaknesses in houses such as gaps, cracks to combustible construction materials and can quickly lead to ignition of the building.

Significantly, vegetation that is established adjacent to the building and within the Asset Protection Zone following the construction of the building, which provides fuel for burning embers to ignite and increase the ignitability of the building. It is critical that the Asset Protection Zone are maintained throughout the life of the property, so that wildfire is not encouraged closer to the building.

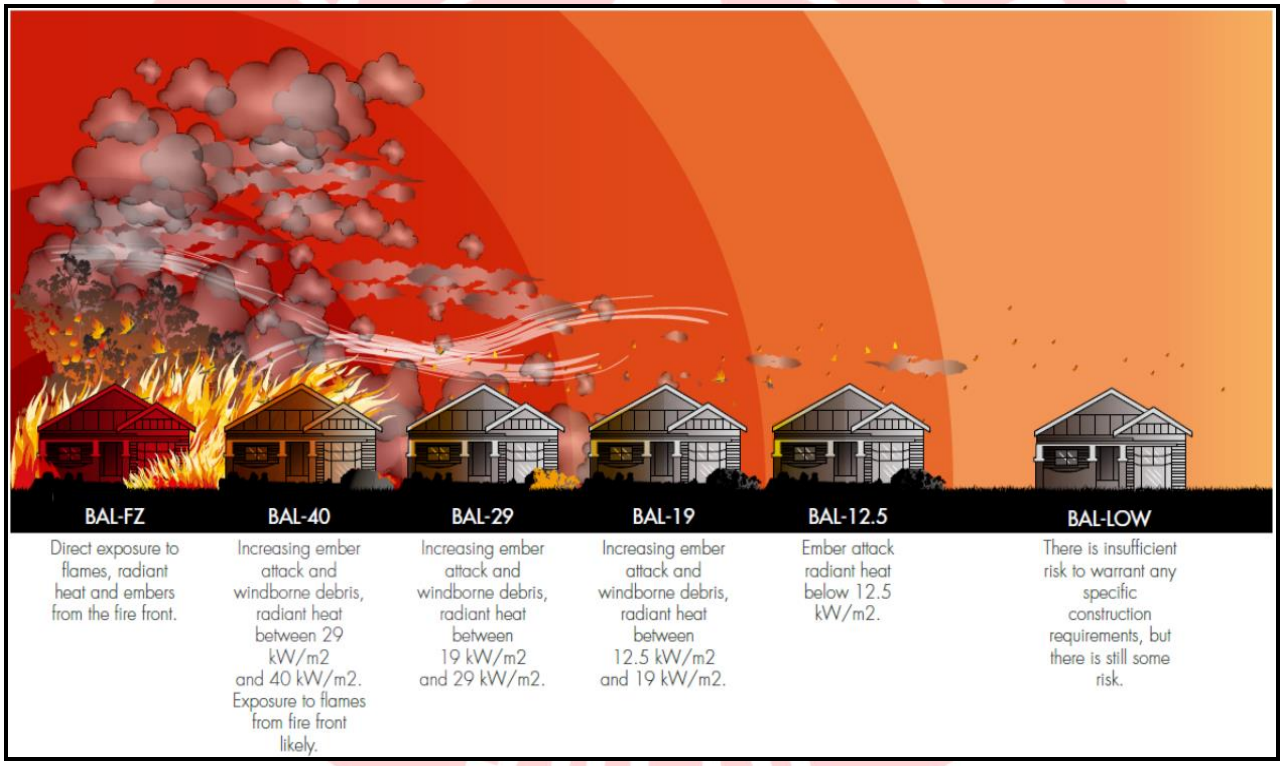
The research has illustrated the separation between the bushfire threat and building; and the construction standards of the building are the principal elements to building survivability. It is critical that:

1. Any future alterations and additions to the building are undertaken with materials that comply with the relevant BAL of the building.
2. The separations between the building and bush fire threat (known as the Asset Protection Zones (APZ)) are maintained to low flammability. This means restricted gardens and combustible elements, such as timber landscaping and furnishings. It is critical to maintain '*fire hygiene'* around the building.

Australia Standard 3959 Construction of buildings in Bush fire prone areas and Bush fire Attack Level (BAL)

Bush fire Attack Level (BAL) ratings refer to the fire intensity your house is likely to be subjected to in a bush fire, expressed in terms of radiant heat. The BAL assessment forms the construction component of the bush fire assessment process. The other component is the Bush fire planning, which includes Asset Protection Zones (APZ), separation to provide defendable spaces, access, water, electricity, gas, landscaping and emergency management.

Furthermore, the measures contained in the *Australian Standard 3959 Construction of buildings in Bushfire Prone Areas* for each BAL construction level are not for fire resistance. The building will burn. The construction standards are aimed at slowing the ignition and fire spread of the building to provide adequate time to enable occupants to shelter within the building as the bushfire front passes. The degree of vegetation management within the APZ, the unpredictable nature of behaviour of fire, and extreme weather conditions make building adjacent to vegetation very dangerous.



Relationship between fire behaviour and BAL (WA Guidelines for Planning in Bush fire Prone Areas, 2017)

Design and Siting

The design and siting of a building can be of critical importance during bush fire attack event. The appropriate design and siting can reduce the impact of bush fire attack mechanisms of direct flame, radiant heat, ember attack, smoke, and wind. Key principles to consider when designing and siting a new development include the following:

- Avoid building on ridges, saddles and build on level ground wherever possible.
- Utilise cut-in benches, rather than elevating the building when building on sloping land.
- Avoid raised floors and protect the sub-floor areas by enclosing or screening.

- Provide an appropriate shelter room that is located on the lowest or non-bush fire hazard side of the building, near building exits and provides the occupant views of the outside environment.
- Reduce bulk of building, limit re-entrant corners, and incorporate simplified roof that are able to self-clean of debris.
- No gutters on second or consecutive storeys of building and avoid box gutters.
- If gutters are installed, incorporate gutter guards with a flammability index more than 5 when tested to AS1530.2, or aluminium, bronze, or stainless steel with maximum aperture of 5mm.
- Limit glazing elements on the sides of the building exposed to the bush fire threat and use shutters to protect glazing elements.
- Carparking provided in a location that does not interfere with escape routes.
- Position development so any gas supplies and overhead electricity are positioned not to impede egress to and from the site.
- Class 10a buildings (such as shed, carport, and garages) should be a minimum of 6m away from any other building. Consider the storage of hazardous materials (petrol, kerosene, alcohol, LPG, natural gas, acetylene, vehicle, machinery etc.) within Class 10a buildings when siting in proximity to Class 1a occupied building and escape routes.
- Provide unobstructed access around the entire building supported by a minimum 1m wide concreted path to the external wall.

Asset Protection Zones

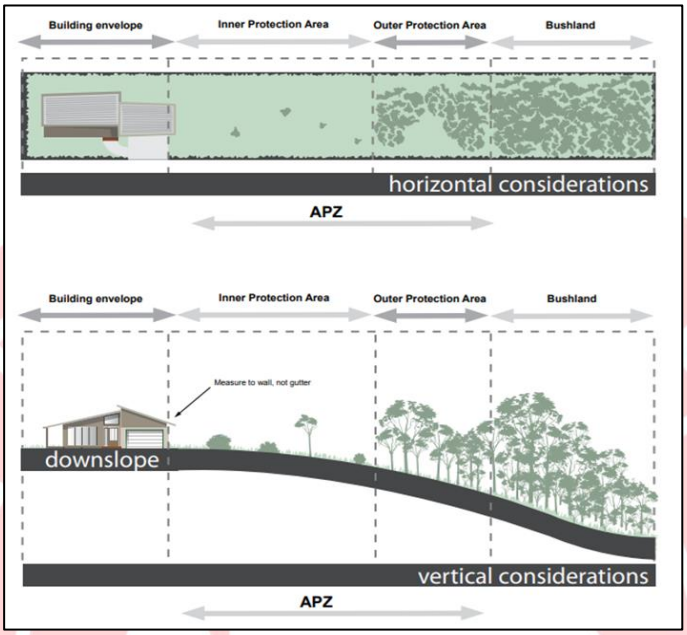
An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance to the below standards should be undertaken on an annual basis, in advance of the fire season, as a minimum.

For a complete guide to APZs and landscaping, download the NSW RFS document Standards for Asset Protection Zones at www.rfs.nsw.gov.au/resources/publications .

An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA) as indicated below. An APZ can include the following:

Footpaths	Driveways
Lawns	Unattached non-combustible garages as long as suitably separated
Discontinuous gardens	Open space / parkland
Swimming pools	Car parking

Isolated areas of shrub and timbered vegetation are generally not a bush fire hazard as they are not large enough to produce fire of an intensity that will threaten dwellings. These areas include narrow strips of vegetation along road corridors.



Components of an APZ (Figure A4.1 - PBP 2019)

Any areas that are designated Asset Protection Zones, should be delineated by rural fencing, signposted or bollards (whatever is practical in the circumstances) to ensure vegetation creep does not occur and further landowners and ground management are aware that the area is to be maintained for Bush fire protection purposes. Examples are provided below:

Inner Protection Area (IPA)

The IPA extends from the edge of the OPA to the development. The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. The intent of an IPA is to stop the transmission of flame and reduce the transmission of radiant heat by the elimination of available fire fuel. This area also allows

airborne embers to fall safely without igniting further outbreaks and provides a safer firefighting position and is operationally important for implementation of clear fire control lines.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well-maintained gardens. When establishing and maintaining an IPA the following requirements apply:

- Vegetation within the IPA should be kept to a minimum level. Litter fuels (leaves and vegetation debris) within the IPA should be continually removed and kept below 1cm in height and be discontinuous. There is minimal fine fuel at ground level which could be set alight by a bushfire.
- Canopy cover should be less than 15% (at maturity). Trees (at maturity) should not touch or overhang the building and should be separated by 2 to 5m.
- Lower limbs of canopy trees should be removed up to a height of 2m above ground.
- Preference should be given to smooth barked and evergreen trees.
- Large discontinuities or gaps in the shrub vegetation shall be established to slow down or break the progress of fire towards buildings.
- Shrubs should not be located under trees and not form more than 10% ground cover
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
- Grasses should be kept mown (as a guide grass should be kept to no more than 100mm in height), and
- Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not permitted in the IPA.

Outer Protection Area (OPA)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels, reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some

separation in the canopy. When establishing and maintaining an OPA the following requirements apply:

- Tree canopy cover should be less than 30%, canopies should be separated by 2 to 5m
- Shrubs should not form a continuous canopy and form no more than 20% of ground cover
- Grasses should be kept to no more than 100mm in height with leaf and other debris should be mown, slashed or mulched.

Furthermore, the edge of the APZ should be clearly delineated to ensure vegetation creep does not occur over time, reducing the separation between the bushfire hazard and building.

Gardens and vegetation within the APZ

All vegetation will burn under the right conditions.

In choosing plants for landscaping consideration should be given to plants that possess properties, which help to protect buildings. If the plants themselves can be prevented from ignition, they can improve the defence of buildings by:

- Filtering out wind-driven burning debris and embers.
- Acting as a barrier against radiation and flame, and
- Reducing wind forces.

Consequently, landscaping with vegetation of the site should consider the following:

- Meet the specifications of an Inner Protection Area (IPA) detailed in PBP 2019.
- Priority given to retaining or planting species which have a low flammability and high moisture content.
- Priority given to retaining or planting species which do not drop much litter in the bushfire season, and which do not drop litter that persists as ground fuel in the bush fire season, and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.
- Avoid gardens within 10m of the exterior building envelop.
- Trees and shrubs within 40m are not continuous, but instead arranged as discrete patches separated by a ground layer with low fuel hazard, such as mown grass.
- Position courtyards, gardens, and grassed areas in locations that facilitate the protection of the building.
- Install pebble/rock garden beds avoiding the use of mulch and wood chip.

Consideration should be given to vegetation fuel loads present on site. Careful thought must be given to the type and physical location of any proposed site landscaping.

Inappropriately selected and positioned vegetation has the potential to 'replace' any previously removed fuel load.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered. The below list of well know ground fire-retardant plants is intended as a guide only, check with your local council for information more specific to your area.

Lomandra longifolia	*Dampiera*
Lomandra hystrix	*Scaevola aemula*
Anigozanthos hybrids	*Succulents (most)*
Agapanthus orientalis	*Carpobrotus (Pigface)*
Liriope muscari	*Cotyledon*
Carpobrotus glaucescens	*Ajuga australis*
Casuarina glauca	*Myroporum*
Ajuga	*Nepeta* (catmint)
Brachyscome	*Mesembryanthemum*

Strategically positioned elevated vegetation (fire-retardant tree and shrub species) can act as 'windbreaks' and 'ember filter', reducing wind velocities and suppressing the density of embers attacking a building. It is critical that this vegetation is:

- On flat ground place >30m from the building (ideally 40m forming the outer perimeter of the IPA).
- >20m separation from the hazardous vegetation.
- Located on the side of the bush fire hazard.
- No gardens of shrubs under the trees.
- Shrub patches no greater than $10m^2$.

The below list of well know fire-retardant trees and shrubs is intended as a guide only, check with your local council for information more specific to your area:

Melia azederach (Cape Lilac)	*Citrus trees*
Brachychiton aecerifolius (Flame tree)	*Loquot*
Magnolia grandiflora	*Arbutus Quercus (only the deciduous oak)*
Pyrus (most ornamental pears)	*Feijoa*
Magnolia Little Gem	*Gleditzia*
Ulmus chinensis (Chinese Elm)	*Ficus (all including edible)*
Acacia howitii	*Aloe (all)*
Cercis (Judus Tree)	*Correa*
Acmena smithii (Lilypily)	*Acacia iteaphyla*
Prunus (all including ornamental)	*Scaevola crassifolia*
Cupaniopsis anacardiopsis (Tuckeroo)	*Viburnum tinus*
Malus (apple trees)	*Atriplex (saltbush)*
Eleocarpus	*Escallonia*
Mullbery	*Maireana (Cottonbush)*
Eremophila (Emu bush)	*Leucophyta brownii*
Melaleuca nodosa	*Plectranthus*
Syzygium (lilypilly)	*Santolina*
Photinia	*Coprosma*
Rhagodia (saltbush)	*Strelitzia*
Acacia Cyclops	*Senna (Silver Cassia)*

Recent post-fire research from the 2019/20 bushfire season suggests greenness factor (the extent to which plants are actively growing) had an impact on building survivability to a bushfire, indicating that maintained green grasses and landscape watering features are beneficial during a bushfire.

It is essential that any vegetation and landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

Landscaping features within the APZ

A combination of hard (materials) and soft (design) landscaping will benefit the survivability of a building during a bushfire event. The type, quantity and condition of fuel has a very important effect on bushfire behaviour in proximity to a building. Poorly located vegetation that burns readily may expose a house to increased levels of radiant heat and flame contact.

- Non-flammable features such as tennis courts, swimming pools, dams, patios, driveways or paths should be incorporated into the proposal, especially on the northern and western sides of the proposed building.
- Remove other flammable objects from around the house. These include sheds, caravans, outdoor furniture, barbeques, gas bottles, wood piles and organic mulch.
- Avoid flammable mulches within the APZ. Alternatives include gravel, scoria, pebbles, shells or recycled crushed bricks.
- Use non-combustible, moveable containers and pots that can be relocated in the summer.
- Restrict the use of door mats and place firewood stacks >10m from building.
- Restrict the use of timber and use materials such as brick, earth, stone, concrete and galvanised iron
- Metal screens can help to shield your house from radiant heat, direct flame contact and ember attack.
- An intensive area of planting centred on a contoured garden mound provide an effective screening.
- Fencing in BAL 29 or within 6m of a building should be of non-combustible materials.
- Establish a path immediately around the external wall of the building. Do not place garden beds adjacent to the external fabric of the building and under windows.
- Clumping shrubs and trees so they do not form a continuous canopy and are separated by areas of low fuel (maintained green grass lawn).

Further information can be found here - Landscaping for bushfires

Access Requirements

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defendable space are afforded in the development/building design.

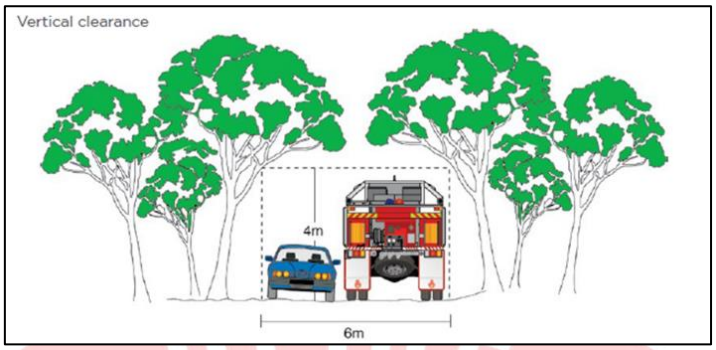
Local Area Traffic Management (LATM)

The objective of LATM is to attain an acceptable level of speed, volume, and composition of traffic within a local area and reduce the number of road accidents. This is achieved by modifying the street environment through the installation of various traffic control devices. LATM devices by their nature are designed to restrict and or impede the movement of traffic, especially large vehicles, which conflicts with the intent for access required by the NSW RFS and may significantly increase response times for emergency services.

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

Vertical clearance

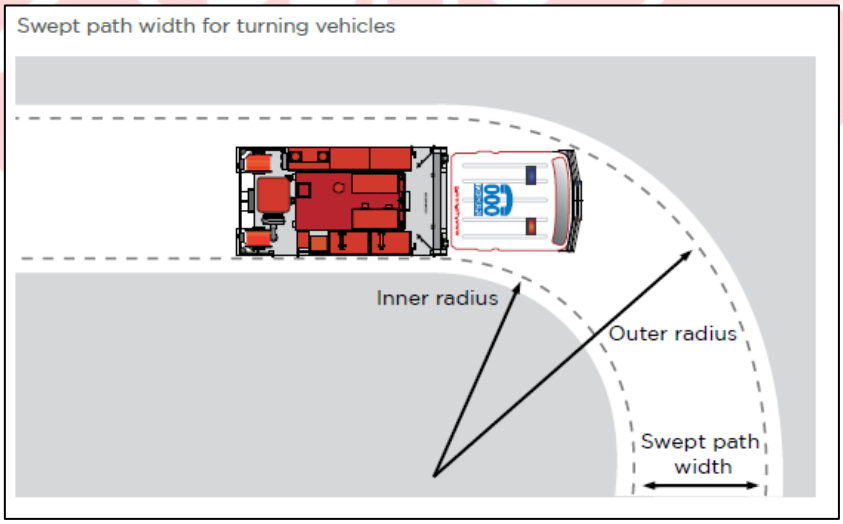
An unobstructed clearance height of 4 metres should be maintained above all access ways including clearance from building construction, archways, gateways/doorways, and overhanging structures (e.g., ducts, pipes, sprinklers, walkways, signs and beams). This also applies to vegetation overhanging roads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

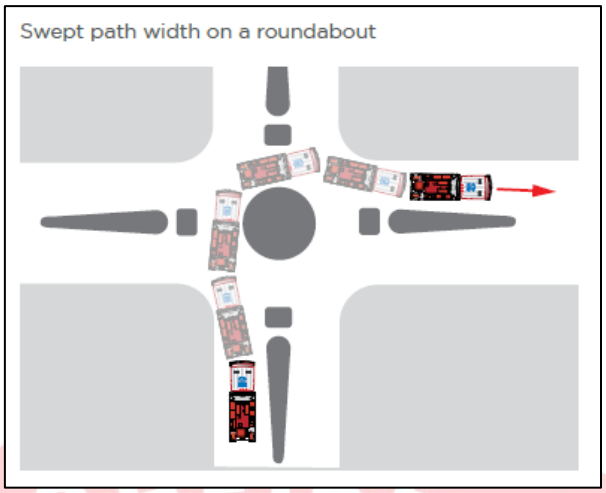


Vehicle Turning Requirements

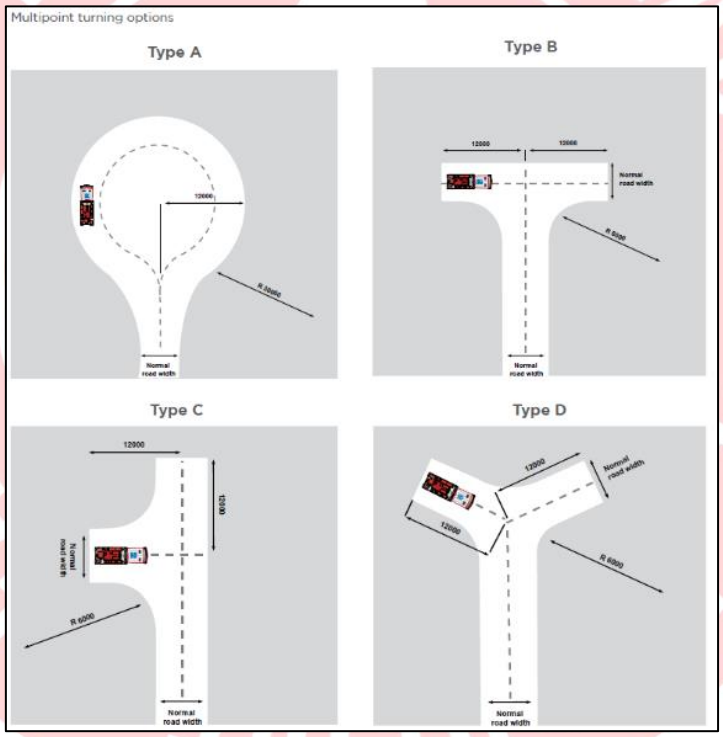
Fire crews must have rapid access and egress for vehicles, therefore curved carriageways should be constructed using the minimum swept path. The below diagrams from PBP2019 provide indication of the requirements to be achieved.

Minimum curve radius (inside edge (m))	Swept path (m) wide
<40	4.0
40 -69	3.0
70 - 100	2.7
>100	2.5





Where a turning head is proposed the NSW RFS requires that dead ends having a length greater than 20 metres should be provided with a turning head area which avoids multipoint turns.



Passing Bays

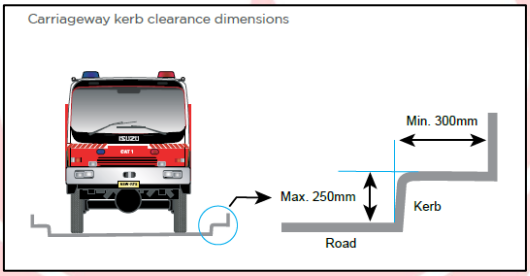
The construction of passing bays, where required, shall be 20m in length, provide a minimum trafficable width at the passing point of 6m.

Parking

Parking can create a pinch point within the road reserve. The location of parking should be carefully considered to ensure fire appliance access is unimpeded. Hydrants should be located clear of any parking areas to ensure that access is always available.

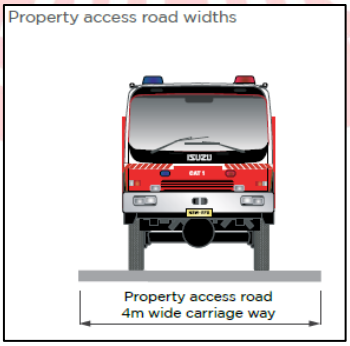
Kerb Dimensions

All kerbs constructed around access lanes 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.



Road Types

Property access is required to be 4m wide all-weather road. Can be sealed or unsealed.



Water Supply

The intent of water measures is to provide adequate services of water for the protection of dwellings during and after the passage of a bush fire.

Where reticulated water supply is not provided, a static water supply for fire-fighting purposes should be above-ground, accessible, clearly marked and manufactured from concrete or metal. If raised, the tank stand should be made from non-combustible material. These static water supplies (tanks) should be positioned on the non-hazard side of the building and have 65mm Storz outlet with a ball valve fitted to the outlet within the IPA. If not appropriate, they should be appropriately shielded to protect the tank and fire fighters accessing the water. Category 1 fire appliances should be able to access within 4 m of static water supply with a hardened ground surface to support this access.

Electricity, Gas supplies and Hazardous materials

The intent of electricity, gas and hazardous material measures is to locate these utilities and materials so as not to contribute to the risk of fire to a building.

Electricity

Location of electricity services should limit the possibility of igniting the surrounding bush land or the fabric of buildings. Where practicable, electrical transmission lines are underground. If overhead, electrical transmission lines are installed with short pole spacing (30m), unless crossing gullies, gorges, or riparian areas, then 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.

For further information visit https://www.electricitysafety.com.au/

Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS/NZS 1596:2014. All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side. All above-ground pipes and connections to and from gas cylinders are metal, and polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not permitted. Furthermore, 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. Gas utilities should be positioned to not impede fire fighters accessing water supplies while undertaking suppression operations.

Hazardous Materials

Hazardous materials are any materials that can fuel the fire, such as leaf litter, grass, garden mulch and woodpiles. They can also be made up of solid combustibles or flammable liquids and gases such as petrol, kerosene, alcohol, LPG, natural gas, and acetylene. Vehicle, machinery, and other mechanical equipment that utilise fuels for operations can also be considered hazardous. The incorrect design and placement of carport and garages in residential developments could propagate fire towards the residential dwelling. Any liquids or fuels that are considered hazardous should be positioned away from the dominant bush fire threat. If located in a building/structure, it should be a minimum of 6m away from any other building. Vegetation surrounding these locations shall be maintained to IPA standards and the construction standards shall minimise the impact of ember attack to ignite the structure.

Construction Requirements

Groundwork and Sub-structure construction phase

During the ground phase potential ignition sources of the subject development may include hot works, incorrect disposal of cigarette butts and hot exhausts from vehicles, electrical failures, and sparks from metal contact.

Groundwork and Sub-structure construction phase fire management plan should be developed. Preparation of the site should include mitigating fire ignition sources. This should include vegetation management such as slashing and mowing long grasses in and around the development site, car parking and access tracks. This is especially important during summer months where Rates of Spread of fire can significantly increase due to the prevailing weather condition.

Handheld fire extinguishers should be carried on each vehicle and on site for quick access and suppression of fires.

Where neither reticulated water nor an existing static water supply is available during the construction phase, a temporary 10,000 litre Static Water Supply within proximity of the development site shall be provided before the commencement of any construction works. This temporary supply will allow for the replenishment of attending fire services which will facilitate the rapid suppression of any potential ignitions. The temporary supply may be removed when the prescribed fire-fighting water supply is installed.

Ongoing Operations

Routine inspections of bush fire safety systems and equipment generally occur annually and are supported by a Bushfire Plan. Ideally these inspections should occur moving out of the colder months in preparation for the bushfire season. The most common types of inspections that are required are surface, near surface (grasses and debris) and elevated (shrub) fire fuel level accumulation in APZs, canopy separation reequipments in APZs, and maintaining building fire hygiene such as cleaning gutters and down pipes.

Developing and annually reviewing a bushfire plan, no matter how big or small the development, is critical to the ongoing maintenance of the Bushfire Protection Measures identified within this report.

Construction Standards

Australian Standard 3959 ‘’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 Bushfire Protection – 2019 document.

Retrofitting

Any future alterations, extension to structures, even if they are complying, should consider the appropriate bushfire construction standards at that time. Homes built prior to August 2002 were not required to be built to meet bush fire construction standards. Constructions in Bush fire prone lands after August 2002 required bush fire construction standards, which have also changed over time.

The current construction standards are based on your Bush fire Attack Level (BAL). Evidence from large wildfire events over the last 20 years illustrate that house ignition is concentrated within 100m from the vegetation, although it can occur kilometres from the burning vegetation under worst case scenarios. Developments outside the bush fire prone area (100m from the vegetation) will benefit from increasing construction standards to withstand ember-attack to protect the building during a bush fire event.

When undertaking alterations and additions to a dwelling in Bush fire prone land only the new construction is required to conform with the current requirements, although this only partially protects your home.

Research has illustrated that ember-attack from the wildfire is the principal mechanism that ignites homes. The most vulnerable elements are timber decks, Eave fascia boards, gutters timber window frames and timber stairs. Furthermore, house-to-house fires occur following the ignition of a neighbouring property. Appropriate amount of effort should be placed to ensure that vegetation and landscaping should be maintained to reduce the likelihood of ember attack igniting fire fuels near the house, and separation between neighbouring houses is achieved to reduce house-to-house fires. The use of non-combustible fencing and appropriately positioned windows can go a long way to reducing the risk of house-to-house fires.

While retrofitting identifies available construction protection methods as per *AS3959 – Construction of buildings in Bushfire Prone Area*, **it should be clearly understood that such building enhancements are complementary to good site preparation and vegetation management in the context of the bushfire survival plan**.

Routine maintenance is an important part of bushfire protection for your home, out-buildings and garden. For example, if a window/door metal shutter is fitted, it needs to work at the time of a bushfire threat just like your fire equipment needs to be ready to go.

Each retrofitting measure is a step towards making your home safer against the impact of embers and radiant heat in the event of a bushfire. If you want your home to be comparable to the construction requirements under AS 3959, then *ALL* the works associated with a particular BAL category will need to be undertaken.

Some of the basic retrofitting that can be undertaken:

- Enclose existing sub floors with suitable materials or construct the floor and structure with non-combustible materials
- Cover, seal, overlap, back or butt-joint all joints in the external surface material of walls to prevent gaps greater than 2mm.
- Seal vents, weepholes, breathers and openings with metal screens of aperture <2mm.
- Replace flammable external walls with non- combustible materials.
- Apply sarking-type material (flammability index >5) over the outer face of the building frame prior to re-fixing of any external cladding.
- Screen all windows and doors with metal screens of aperture <2mm and metal frames.
- Establish weather strips, draught excluders or draught seals around doors and panel lift garage doors.
- Garage roller doors could have guide tracks with a maximum gap area of 3mm and be fitted with a nylon brush in contact with the door.
- Above-ground, exposed water, gutter downpipes and gas supply pipes should be metal.
- incorporate gutter guards with a flammability index more than 5 when tested to AS1530.2, or aluminium, bronze, or stainless steel with maximum aperture of 5mm.
- Only use Bushfire resisting timber as specified in AS 3959 Appendix F.

Further information can be found at Guide-retrofit-your-home-for-better-bushfire-protection.

Electric Vehicles (EVs)

EVs are an ever-growing part of the transport environment with government aims of EV vehicles dominating throughout the 2030's. There are a variety of different technologies, battery types, and chemistries in vehicles, e-scooter and e-bikes creating complexity on the risk of '*thermal runaway'*.

Thermal runaway is an unstable chemical process that begins when heat generated within a battery exceeds the amount of heat that is dissipated to its surroundings, which can lead to the battery catch fire. EV batteries tend to put out toxic fumes resulting in suppression difficulties.

Although the chances of batteries catching fire is relatively small <0.1%, approximately 1/3rd of fires occur during charging. the location of residential parking of Plug-in Hybrid Electric Vehicles (PHEVs) vehicles should be considered when planning inconsideration of occupied buildings and extinguishment requirements.

Having a smoke/heat alarm, a F-500 (class A, B and F) Lithium-Ion Battery fire extinguisher in an open-air charging station (unenclosed building) that is location >6m from any building or flammable vegetation will significantly mitigate risk of a EV fire spreading.

Further information can be obtained at: https://www.evfiresafe.com/

Bushfire Emergency / Survival Plan

No matter how big or small the development is within a bush fire prone area, a bush fire plan is critical to preparing the property in the event of a bush fire. To ensure appropriate measures are taken, the worst-case scenario bush fire behaviour should be used to determine the course of action.

There is extreme noise, smoke, heat, and wind during the passing of a bush fire front under worst-case conditions. Vision, hearing, breathing, and communication are significantly affected during this period.

State bush fire authorities have established kits to help residential and small property owners to develop appropriate plans to plan and prepare for bush fire events. In NSW Bush fire survival Plans can be accessed from https://www.rfs.nsw.gov.au/plan-and-prepare/bush-fire-survival-plan.

The principal elements of the Bush fire survival Plans are:

- Know your risk.
- Know and understand the bush fire alert levels.
- Access to 'Fires Near Me' app.
- Knowledge of Local radio, local ABC/emergency broadcaster frequency, and TV.
- Prepare yourself, your home and your family.
- Leave early or prepare to stay.
    - If leaving, when to leave, where will you go, how will I get there, what will I take, who will you call, what is your back-up plan.
    - If you stay, do you have all the equipment you need, what are the signal to start defending the dwelling, what to do before, during and after the passing of the fire front, do all members of the household know what to do, check your equipment, develop action checklist, what is your back-up plan.
- Discuss all elements with your family and neighbours.

Furthermore, knowledge of escape routes (generally the public road system around your dwelling),

refuges and location of any nearby Neighborhood Safer Places is critical knowledge prior to a bush fire event.

A bushfire emergency management and evacuation plans are prepared consistent with Australian Standard AS 3745:2010 Planning for emergencies in facilities. State agencies also have developed guidelines to facilitate the development of the documents and other Australian Standards are relevant for different development type. Bushfire emergency management and evacuation plans should be complemented with a Bushfire Management Plan (BMP).

A simple 4 step process can be undertaken to develop a basic bushfire emergency survival plan:

DISCUSS

STEP 1

DISCUSS WHAT TO DO IF A BUSH FIRE THREATENS YOUR HOME

Many households find that having a discussion over dinner works best as everybody is together and focussed.

Download the Step 1 discussion guide (PDF, 985.3 KB).

PREPARE

STEP 2

PREPARE YOUR HOME AND GET IT READY FOR BUSH FIRE SEASON

There are simple things you can do around your home to prepare it for a bush fire, like keeping the grass low and having a cleared area around your home.

Download the Step 2 checklist (PDF, 595.5 KB).

KNOW

STEP 3

KNOW THE BUSH FIRE ALERT LEVELS

If there is a fire in your area you will find its alert level on the NSW RFS website and in the 'Fires Near Me' app. You need to keep track of the alert level so you know what you should do.

Download Step 3 (PDF, 166.1 KB).

KEEP

STEP 4

KEEP ALL THE BUSH FIRE INFORMATION NUMBERS, WEBSITES AND THE SMARTPHONE APP

In a bush fire, it's important that you stay up to date on conditions in your area.

Download Step 4 (PDF, 219.1 KB).

Bushfire Management Plan

No matter how big or small the development is within a bushfire prone area, a bushfire plan is critical to preparing the property in the event of a bushfire. To ensure appropriate measures are taken, the worst-case scenario bushfire behaviour should be used to determine the course of action.

State bushfire authorities have established kits to help residential and small property owners to develop appropriate plans to plan and prepare for bushfire events. These can be accessed by contacting your local fire authority.

For larger development such as industrial, commercial and developments that accommodate vulnerable people, more comprehensive emergency management requirements and procedures should be developed.

At a minimum, the Bushfire Management Plan should illustrate the Bushfire Protection Measures (location and type of hazard (vegetation), defendable space, access, water, and construction standards) that will be implemented as part of the development to reduce the risk from bushfire to an acceptable level and should be clearly displayed within the property to ensure current occupants are aware of the bush fire risk.

Furthermore, the BMP can provide information that assists in wildfire suppression operations, such as:

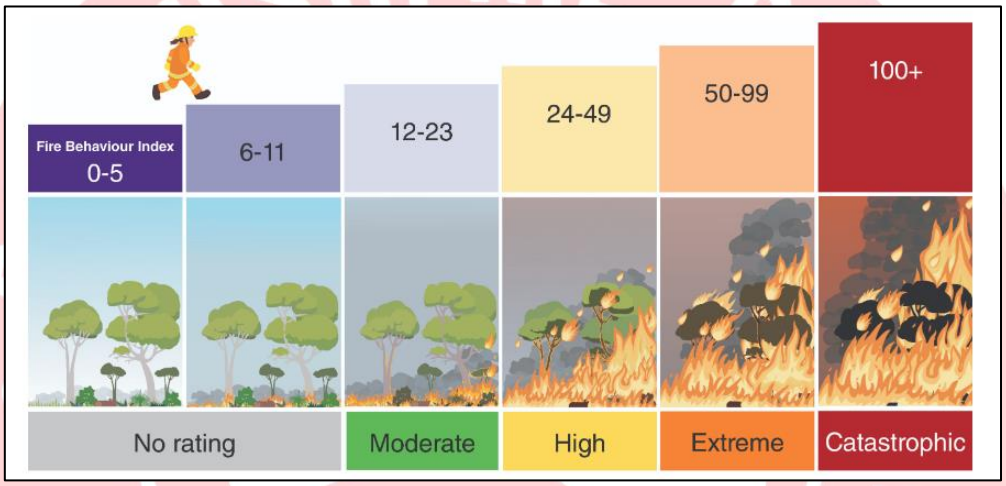
- 24/7 emergency contact details including alternative telephone contact.
- Location of site infrastructure and assets.
- Fire-fighting water supply plan.
- Site access and neighbour/ internal road plan.
- Identification of built, natural and cultural assets in and around the site.
- Emergency escape routes, refuges, and location of any nearby Neighbourhood Safer Places.
- Location of Fire Management Zone, specifically Asset Protection Zones.
- Location of hazards (Physical, Chemical and Electrical) that will impact on fire-fighting operations and procedures to manage identified hazards during fire-fighting operations.
- Aviation assets (helipads and aviation water supplies) and risks (powerlines).
- Fire history in and around the site, and
- Schedule of on-ground works and review and updating schedule.

Updated Australian Fire Danger Rating System

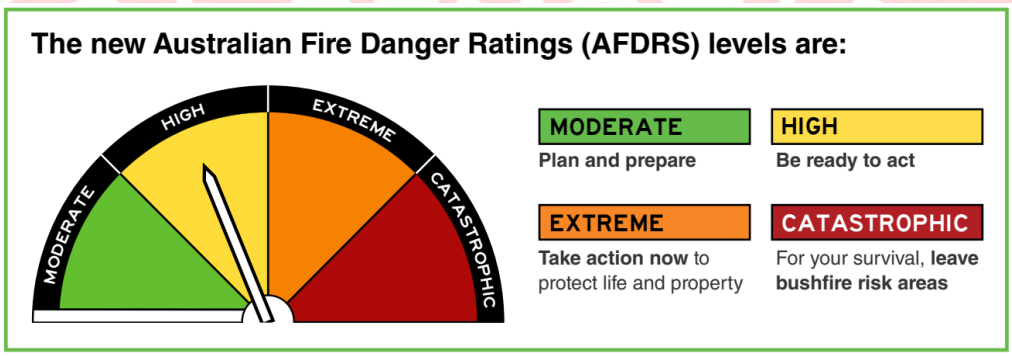
The principal objective of the new Australian Fire Danger Rating System (AFDRS) is to implement a more accurate and nationally consistent system that will enable improved decision-making by response agencies and industry and provoke the desired community response to messaging in order to improve public safety. More information at https://www.rfs.nsw.gov.au/news-and-media/newfdr

The AFDRS uses the latest scientific understanding about weather, fuel and how fire behaves in different types of vegetation to improve the reliability of fire danger forecasts. This strengthens the ability of those working in emergency services to be better prepared, make improved decisions, and provide better advice to the community.

It is aimed at a simplified, action-oriented Fire Danger Rating System.



Accessed from AFAC: https://www.afac.com.au/initiative/afdrs/afdrs-faqs



Accessed from AFAC: https://www.afac.com.au/initiative/afdrs/afdrs-faqs

MODERATE: *Plan and Prepare* - Have a plan and be ready to act if a fire starts.

HIGH: *Be ready to act* - Be alert for fires in your area and be ready to leave or be ready to defend.

EXTREME: *Take action* - Act before a fire starts.

CATASTROPHIC: *Leave high risk areas* - Protect your life, leave early.