

**BUSH FIRE
ASSESSMENT
REPORT**

**Two (2) x Lot
Subdivision**

**Lot 17 DP 818185
Crescent Head Road
Crescent Head**

**Paul and Ariane
Brose**

November 2021

1.0 INTRODUCTION

A Bush Fire Assessment has been carried out for a proposed two (2) x lot subdivision of Lot 17 DP 818185 Crescent Head Road, Crescent Head.

This report is based on a site assessment carried out on 29th June 2021 and provides a basis for compliance with respect to NSW Rural Fire Services, Planning for Bush Fire Protection 2019 (PBP, 2019) and AS3959 (2018).

The subdivision would be an integrated development and has a requirement for a Bushfire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979 No 203.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2019 (PBP, 2019).
6. AS 3959-2018 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack.

The report examines ways the risk of bushfire attack can be reduced where the subdivision site falls within the scope of the legislation.

The report is confidential and the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known.

Any such party relies on this report at their own risk.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposed subdivision meets the aims and objectives of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019 and has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire; and
- Comply where applicable with AS3959 – 2018.

1.2 Legislative Framework

In NSW, the bushfire protection provisions of the BCA are applied to Class 1, 2, 3, Class 4 parts of buildings, some Class 10 and Class 9 buildings that are Special Fire Protection Purposes (SFPPs).

The BCA references AS3959 – 2018 as the deemed-to-satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW.

All development on bushfire prone land in NSW should comply with the requirements of the bushfire protection measures identified within NSW Rural Fire Service, *Planning for Bushfire Protection*, 2019.

The proposed subdivision is required to obtain a bushfire safety authority from the NSW Rural Fire Service.

It should be noted that the Rural Fire Service does produce guidelines for upgrading existing buildings, which will be referenced later in the report.

1.3 Location

The site is located at Lot 17 DP 818185 Crescent Head Road, Crescent Head.

Locality – Crescent Head

Local Government Area – Kempsey Shire Council

Closest Rural Fire Service – Crescent Head

Closest Fire Control Centre – Kempsey

Figure 1 – Topographic Map

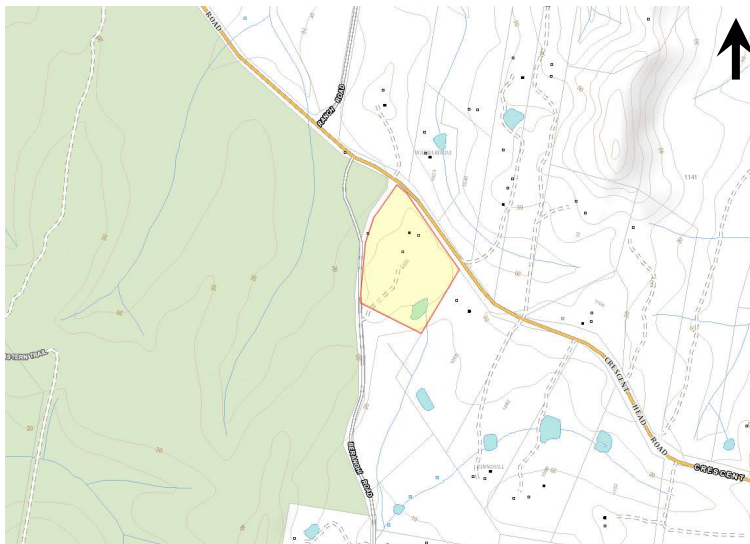


Figure 2 – Aerial View

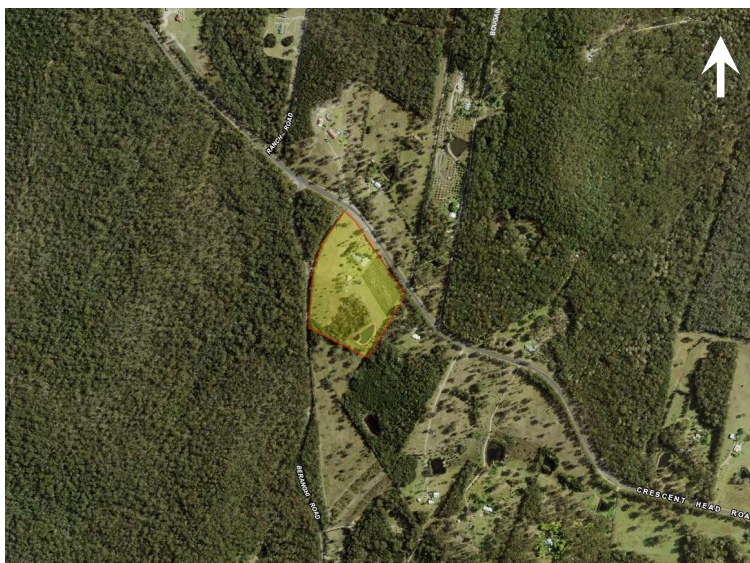


Figure 3: Aerial View Close Up showing the Proposed Lots 1 and 2



1.4 Development Proposal and History

The subject site is approximately 8.6 hectares in size and an existing dwelling is on proposed Lot 1.

To subdivide the subject lot into two (2).

The subdivision layout can be seen in **Appendix 1**.

2.0 BUSHFIRE HAZARD ASSESSMENT

2.1 Assessment Methodology

Several factors need to be considered in determining the bushfire hazard.

These factors are slope, vegetation type, and distance from hazard, access/egress and fire weather.

Each of these factors has been reviewed in determining the bushfire protection measures.

The assessment of slope and vegetation being carried out in accordance with NSW Rural Fire Service, Planning for Bushfire Protection, 2019.

2.2 Slope Assessment

Slope is a major factor to consider when assessing the bushfire risk.

The slopes were measured using a RangeFinder Tru Pulse 200.

The hazard vegetation on adjacent land was also identified and the slopes within the vegetation measured.

The following table shows the results:

Table 1 – Hazard Vegetation Slopes Lot 1 (Existing Dwelling)

Hazard Aspect	Slope	Upslope/Downslope or Flat
North	0-5°	Downslope
South	0-5°	Downslope
West	0-5°	Downslope

Hazard Vegetation Slopes Lot 2 (Proposed Dwelling)

Hazard Aspect	Slope	Upslope/Downslope or Flat
North	0-5°	Downslope
South	0-5°	Downslope
East	0-5°	Downslope
West	0-5° 5-10°	Downslope Downslope

2.3 Vegetation Assessment

The vegetation on and surrounding the subject site was assessed over a distance of 140m.

The vegetation formations were classified using the vegetation formation as detailed in Planning for Bush Fire Protection, 2019.

2.3.1 Vegetation on the Subject Lot

The existing dwelling is located to the north of the subject lot.

There are areas of forest vegetation in the south and west of the lot and the remainder vegetation on the lot is grassland with a lemon myrtle plantation located to the east of the existing dwelling.

The forest vegetation to the west is a strip of forest vegetation positioned on the boundary approximately 20m wide.

The proposed dwelling for the subdivision is proposed to be located in the southern area of the lot.

2.3.2 Vegetation adjacent and adjoining the Subject Lot

To the north is Crescent Head Road, beyond Crescent Head Road is partially managed land around the existing dwelling.

The adjoining lot to the south is undeveloped and contains a mixture of forest and grassland hazard.

To the east is a lot with an existing dwelling surrounded by grassland and forest vegetation.

Beyond Crescent Head Road to the east there is a lot consisting of partially managed land before it extends into forest vegetation, extending further is a lot with an existing dwelling with areas of managed vegetation.

To the west is a small area of forest land (Maria National Park), then Beranghi Road then Maria National Park.

Photo 1 – to the south of the proposed dwelling site



Photo 2 - To the east of the proposed dwelling site



Photo 3 - To the west of the proposed dwelling site



Photo 4 – To the north of the proposed dwelling site



Photo 5 - Showing the 20m Strip of forest vegetation to the west of the proposed dwelling



Photo 6 - Showing Forest vegetation to the west of the proposed dwelling across Beranghi Road



Photo 7 – Grassland vegetation to the west of the existing dwelling



Photo 8 – Grassland vegetation to the south of the existing dwelling



Photo 9 – Grassland vegetation to the north towards Crescent Head Road



Figure 4: Bushfire Mapping



Table 2 – Hazard Vegetation Lot 1 (Existing Dwelling)

Hazard Aspect	Vegetation
North	Grassland
South	Grassland Forest
West	Grassland Forest

Hazard Vegetation Lot 2 (Proposed Dwelling)

Hazard Aspect	Vegetation
North	Grassland
South	Forest
East	Forest
West	Forest

2.4 Hazard

The hazards are located to the north, south and west for the existing dwelling.

The hazards are located to the north, south, east and west of the proposed dwelling.

Figure 5: Hazards

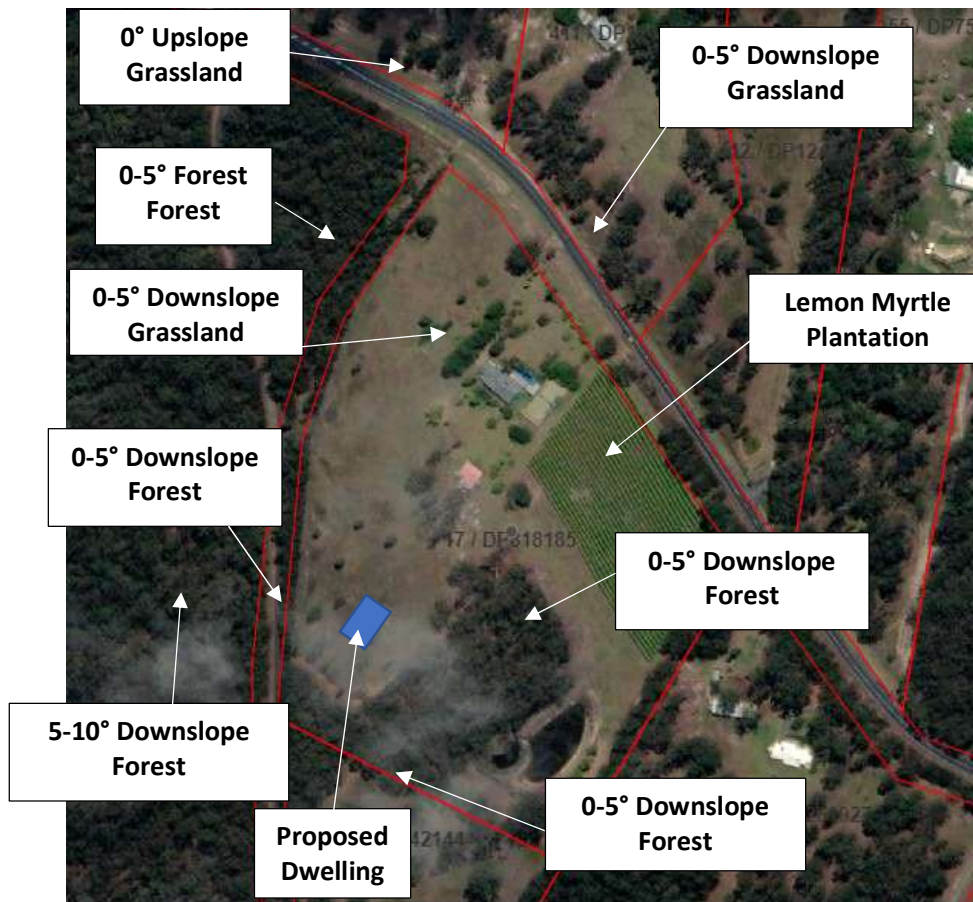


Table 3 – Summary of Hazard Characteristics Lot 1 (Existing Dwelling)

Hazard Aspect	Hazard	Slope	Upslope/Downslope or Flat
North	Grassland	0-5°	Downslope
South	Grassland Forest	0-5° 0-5°	Downslope Downslope
West	Grassland Forest	0-5° 0-5°	Downslope Downslope

Summary of Hazard Characteristics Lot 2 (Proposed Dwelling)

Hazard Aspect	Hazard	Slope	Upslope/Downslope or Flat
North	Grassland	0-5°	Downslope
South	Forest	0-5°	Downslope
East	Forest	0-5°	Downslope
West	Forest	5-10°	Downslope

2.5 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario. In accordance with NSW Rural Fire Service the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

3.1 NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019

The following provisions of NSW Rural Fire Service, *Planning for Bushfire Protection*, 2019 have been identified:

3.1.1 Asset Protection Zone (APZ)

To ensure that the aims and objectives of NSW Rural Fire Services, PBP, 2019, an Asset Protection Zone between the asset and the hazard should be provided. The Asset Protection Zone provides for, minimal separation for safe firefighting, reduced radiant heat, reduced influence of convection driven winds, reduced ember viability and dispersal of smoke.

The proposed subdivision is not considered to be subject to the Special Fire Protection Purpose requirements which are applicable to schools, (the proposed development is not a school).

It is recommended that the Asset Protection Zone can be based upon the minimum requirements for Asset Protection Zones as set out in *Planning for Bush Fire Protection*, 2019.

Table 4 - APZ Requirements (PBP 2019) for the Proposed Lot 1 (Existing Dwelling)

Hazard Aspect	Vegetation Type	Slope	IPA	OPA	Total APZ Required (IPA + OPA)
North	Grassland	0-5° Downslope	11m	-	11m
South	Grassland	0-5° Downslope	11m	-	11m
	Forest	0-5° Downslope	15m	10m	25m
West	Grassland	0-5° Downslope	11m	-	11m
	Forest	0-5° Downslope	15m	10m	25m

The forest to the west is located approximately 92m and the forest to the south is located approximately 99m from the existing dwelling.

A minimum of 23m is to be provided between the existing dwelling and the side boundary see **Appendix 1**.

Table 5 - APZ Requirements (PBP 2019) for the Proposed Lot 2 (Proposed Dwelling)

Hazard Aspect	Vegetation Type	Slope	IPA	OPA	Total APZ Required (IPA + OPA)
North	Grassland	0-5° Downslope	11m	-	11m
South	Forest	0-5° Downslope	15m	10m	25m
East	Forest	0-5° Downslope	15m	10m	25m
West	Forest	0-5° Downslope	15m	10m	25m
	Forest	5-10° Downslope	16m	15m	31m

3.1.2 Inner (IPAs) and Outer (OPAs) Protection Area Requirements

Inner: The IPA is the area closest to the building and creates a fuel managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well-maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- Tree canopy cover should be less than 15% at maturity;
- Trees at maturity should not touch or overhang the building;
- Lower limbs should be removed up to a height of 2m above the ground;
- Tree canopies should be separated by 2 to 5m; and
- Preference should be given to smooth barked and evergreen trees.

Shrubs

- The creation of large discontinuities or gaps in the vegetation, to slow down or break the progress of fire towards buildings, should be provided;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height; and
- Leaves and vegetation debris should be removed.

Outer: An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area

aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; 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.

When establishing and maintaining an OPA the following requirements apply:

Trees

- Tree canopy cover should be less than 30%; and
- Canopies should be separated by 2 to 5m.

Shrubs

- Shrubs should not form a continuous canopy; and
- Shrubs should form no more than 20% of ground cover.

Grass

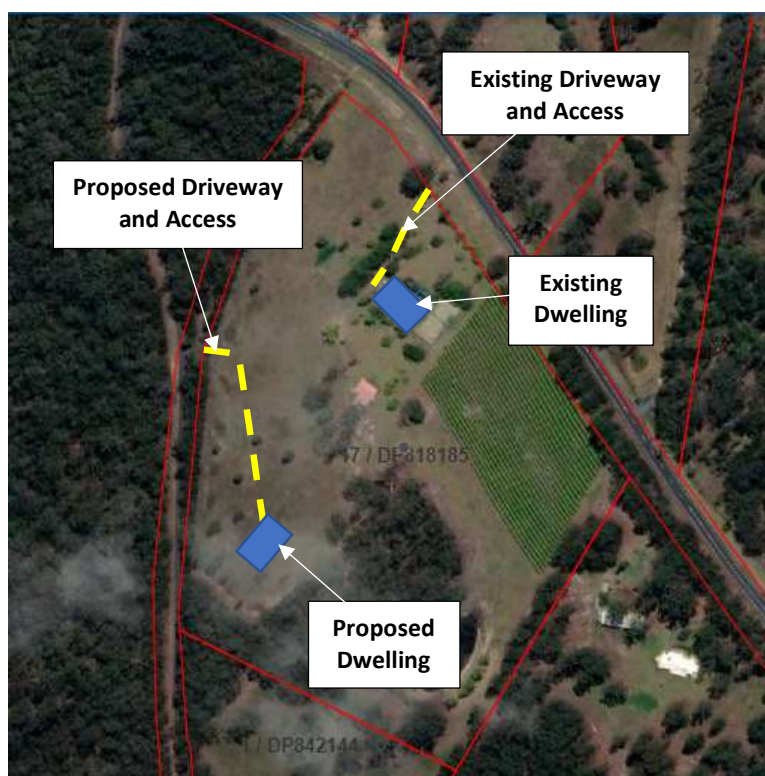
- Grass should be kept mown to a height of less than 100mm; and
- Leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bushfires. Maintenance of the IPA and the OPA as described above should be undertaken regularly, particularly in advance of the bushfire season.

3.1.3 Operational Access and Egress

Access to and egress for proposed Lot 2 will be via Beranghi Road. Access and egress for lot 1 (existing dwelling) will be via Crescent Head Road. Both Crescent Head and Beranghi Road are part of the existing road network.

Figure 6: Aerial Showing Proposed Access for both lots



The access road to the proposed dwelling is approximately 135m in length and will be required to comply with **Table 6**.

Table 6

Table 5.3b		
Performance criteria	Acceptable Solution	Comment
P R O P E R T Y A C C E S S	The intent may be achieved where:	
	<p>Firefighting vehicles can access the dwelling and exit the property safely.</p> <ul style="list-style-type: none"> 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. <p>In circumstances where this cannot occur the following requirements apply:</p> <ul style="list-style-type: none"> Minimum 4m carriageway width; In forest, woodland and heath situations, rural property access roads have passing bays at every 200m that 	<p>N/A</p> <p>To comply N/A</p>

		<p>are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;</p> <ul style="list-style-type: none"> • 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. 	<p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply</p> <p>Can comply</p> <p>Can comply</p> <p>Will comply</p>
--	--	--	--

See **Appendix 3** for Turning Head Options.

3.1.5 Services - Water, Gas and Electricity

As set out in Section 6.8.3 of NSW Rural Fire Services, Planning for Bushfire Protection, 2019, developments in bushfire prone areas must maintain a water supply for firefighting purposes.

Reticulated water supply is not available to the site. A tank supply of 20,000 litres is required to be provided in accordance with PBP, 2019.

Electricity supply is available and connected to the existing. The electrical supply for the proposed dwelling is required to comply with PBP, 2019 (see Table 10 below). To assist in providing protection in a bushfire event, in consideration of the possible loss of electricity, a secondary power supply or a petrol/diesel pump is to be provided. This secondary supply is to be adequately shielded from the fire.

Reticulated gas services are not available to the site however any reticulated or bottled gas is to be installed and maintained in accordance with AS 1596 and the requirements of the relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side of the installation.

If gas cylinders need to be kept close to a building, the release valves are to be directed away from the building and at least two (2) metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders need to be metal. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Table 7

Table 5.3c			
	Performance Criteria	Acceptable Solutions	Comment
WATER SUPPLIES	The intent may be achieved where:		
	Inadequate water supplies is provided for firefighting purposes	<ul style="list-style-type: none"> Reticulated water supply is to be provided to the development where available. A static water and hydrant supply are provided for non-reticulated developments or where reticulated water supply cannot be guaranteed. Static water supplies shall comply with Table 5.3d of the NSW Planning for Bushfire Protection 2019. 	<p>N/A</p> <p>Static water to be provided in accordance with PBP, 2019.</p>
	Water supplies are located at regular intervals	<ul style="list-style-type: none"> Fire hydrant, spacing, design and sizing complies with the relevant clauses of the Australian Standard AS 2419.1 – 2005. 	N/A
	The water supply is accessible and reliable for firefighting operations	<ul style="list-style-type: none"> Hydrants are not located within any road carriageway. Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter road. 	<p>N/A</p> <p>N/A</p>
	Flows and pressures are appropriate	<ul style="list-style-type: none"> Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005. 	N/A
ELECTRICITY SERVICES	The integrity of the water supply is maintained	<ul style="list-style-type: none"> All above ground water service pipes are metal, including and up to any taps. Above ground water storage tanks shall be of concrete or metal. 	<p>N/A</p> <p>To comply</p>
	<p>Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings</p> <p>Regular inspection of lines is undertaken to ensure they are not fouled by branches</p>	<ul style="list-style-type: none"> Where practical, electrical transmission lines are underground. Where overhead electrical transmission lines are proposed: <ol style="list-style-type: none"> Lines are installed with short pole spacing (30 metres) 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 ISSC3 "Guideline for Managing Vegetation near Power Lines. 	To comply

GAS SERVICES	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	<ul style="list-style-type: none"> • Reticulated or bottle gas is installed and maintained in accordance with AS 1596:2014 – The storage and handling of LP Gas, the requirements of relevant authorities and metal piping is to be used. • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation. • Connections to and from gas cylinders are metal. • Polymer-sheathed flexible gas supply lines are not used. • Above ground gas service pipes are metal, including and up to any outlets. 	To comply
--------------	--	---	-----------

Table 8

Table 7.4a			
	Performance Criteria	Acceptable Solutions	Comment
W A T E R	The integrity of the water supply is maintained.	<ul style="list-style-type: none"> • All above ground water service pipes external to the building are metal, including and up to the taps. 	To comply
	A static water supply is provided for firefighting purposes in areas where reticulated water is not available.	<ul style="list-style-type: none"> • Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d; • A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 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; • A hardened ground surface for truck access is supplied within 4m; • Above ground tanks are manufactured from concrete or metal; • Raised tanks have their stands constructed from non-combustible material or bush fire resisting timber (See Appendix F of AS3959); • Unobstructed access can be provided at all times; 	<p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply if applicable</p> <p>To comply</p> <p>To comply</p> <p>To comply if applicable</p> <p>To comply if applicable</p>
S U P P L I E S			

		<ul style="list-style-type: none"> Underground tanks are clearly marked; Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; All exposed water pipes external to the building are metal, including any fittings; Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bushfire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and Fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005. 	<p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply</p>
E L E C T R I C I T Y	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> Where practicable, electrical transmission lines are underground; and Where overhead, electrical transmission lines are proposed as follows; <ul style="list-style-type: none"> ✓ 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 <i>ISSC3 Guideline for Managing Vegetation Near Power Lines</i> 	<p>To comply</p> <p>To comply</p>
G A S	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> 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. 	<p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply</p> <p>To comply</p>

It is considered that the relevant acceptable solutions as provided for by 4.1.3 of NSW Rural Fire Services, PBP, 2019 are capable of being complied with and as such the intent for the provision of services can be achieved.

3.1.6 Landscaping

Landscaping is a major cause of fire spreading to buildings, and therefore any landscaping will need consideration when planning, to produce gardens that do not contribute to the spread of a bushfire.

When planning any future landscaping surrounding any proposed building or subdivision, consideration should be given to the following:

- The choice of vegetation – consideration should be given to the flammability of the plant and the relation of their location to their flammability and on-going maintenance to remove flammable fuels.
- Trees as windbreaks/firebreaks – Trees in the landscaping can be used as windbreaks and also firebreaks by trapping embers and flying debris.
- Vegetation management – Maintain a garden that does not contribute to the spread of bushfire.
- Maintenance of property – Maintenance of the property is an important factor in the prevention of losses from bushfire.

Appendix 4 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019, contains standards that are applicable to the provision and maintenance of Asset Protection Zones.

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

3.2 Construction of Buildings

It is recommended that consideration be given to the existing dwelling in accordance with the Rural Fire Services: Best Practice Guide to Bushfire Protection-Upgrading of Existing Buildings (minimal Protection Measures) can be seen in **Appendix 4**.

3.2.1 General

The deemed-to-satisfy provisions for construction requirements are detailed in AS 3953-2018.

The relevant Bushfire Attack Level and construction requirements have been determined in accordance with PBP, 2019 and AS 3959-2018.

3.2.2 AS3959 – 2018 Construction of Buildings in Bushfire Prone Areas

The following construction requirements in accordance with AS 3959 – 2018 Construction of Buildings in Bushfire Prone Areas is required for the bushfire attack categories.

Table 9

Bushfire Attack Level (BAL)
BAL - LOW No construction requirements under AS 3959-2018
BAL - 12.5
BAL - 19
BAL - 29
BAL - 40
BAL - FZ

The following table indicates the Bushfire Attack Levels applicable once the recommended APZs have been established:

Table 10 – Categories of Attack/Construction Standard Assessment for Lot 1(Existing Dwelling)

Aspect	Hazard Vegetation	Slope	Min Distance to Hazard once APZ Applied	AS 3959-2018 Bushfire Attack Level (BAL)
North	Grassland	0-5° Downslope	23m	BAL-12.5
South	Grassland Forest	0-5° Downslope 0-5° Downslope	23m 47m	BAL-12.5 BAL-12.5
West	Grassland Forest	0-5° Downslope 0-5° Downslope	23m 47m	BAL-12.5 BAL-12.5

Table 11 – Categories of Attack/Construction Standard Assessment for Lot 2 (Proposed Dwelling)

Aspect	Hazard Vegetation	Slope	Min Distance to Hazard once APZ Applied	AS 3959-2018 Bushfire Attack Level (BAL)
North	Grassland	0-5° downslope	11m	BAL-29
South	Forest	0-5° Downslope	25m	BAL-29
East	Forest	0-5° Downslope	25m	BAL-29
West	Forest Forest	0-5° Downslope 5-10° Downslope	25m 31m	BAL-29 BAL-29

The minimum APZ and the BAL 29 contour line for the proposed dwelling can be seen in **Appendix 3**.

The existing dwelling is to be upgraded with regards to construction in accordance with RFS document “Upgrading of Existing Buildings”.

3.2.3 Fences and Gates

Fences and gates may play a significant role in the vulnerability of structures during a bushfire.

With regards to new fences and gates:

- All new fences in bush fire prone areas should be made of either hardwood or non-combustible material.
- Where the fence is within 6m of the building or in areas of BAL 29, they should only be made of non-combustible material.

4.0 EMERGENCY EVACUATION PLANNING

It is recommended that the owners develop a bushfire survival plan with respect to the site.

The decision to stay and defend or to leave should be made well in advance of the arrival of the bushfire.

Any bush fire survival plan should consider the advice offered by the RFS website www.rfs.nsw.gov.au.

5.0 REQUIREMENTS

The following requirements are considered to be integral to this bushfire risk assessment:

1. An Asset Protection Zones as detailed in Section 3.1.1 of this report are to be provided.
2. The proposed subdivision is to comply with the relevant performance criteria/acceptable solutions as provided for by PBP, 2019. It is recommended that consideration be given to the existing dwelling in accordance with the Rural Fire Services: Best Practice Guide to Bushfire Protection-Upgrading of Existing Buildings.
3. Adopt landscaping principals in accordance with NSW Rural Fire Services, PBP, 2019.
4. Any future dwelling is to be constructed in accordance with Section 3.2 of this report.

6.0 CLAUSE 44 CONSIDERATIONS

Table 14

Environmental/Heritage Feature	Comment
Riparian Corridor	Not considered in this report
SEPP 14 – Coastal Wetland	Not considered in this report
SEPP 26 – Littoral	Not considered in this report
SEPP 44 – Koala Habitat	Not considered in this report
Areas of geological interest	Not considered in this report
Environment protection zones	Not considered in this report
Land slip	Not considered in this report
Flood prone land	Not considered in this report
National Park Estate or other reserves	Not considered in this report
Threatened Species, populations, endangered ecological communities and critical habitat	Not considered in this report
Aboriginal Heritage	Not considered in this report

7.0 CONCLUSION

It is suggested that with the implementation of this report, and its recommendations, that the bushfire risk is manageable and will be consistent with the acceptable bushfire protection measure solutions, provided for in NSW Rural Fire Services, PBP, 2019.

The report provides that the required APZ's can be achieved and that the proposed dwelling in the subdivision can be constructed so as to comply with the requirements of AS 3959-2018 and PBP, 2019.

The report considers Asset Protection Zone distances, upgrading of water supply and landscaping provisions, and that consideration be given to the upgrading the existing dwelling in accordance with the Rural Fire Services: Best Practice Guide to Bushfire Protection-Upgrading of Existing Buildings, (Minimal Protection Measures), as can be seen in **Appendix 4**.

This report is however contingent upon the following assumptions and limitations:

Assumptions

1. For a satisfactory level of bushfire safety to be achieved, regular inspection and testing of proposed measures, building elements and methods of construction, specifically nominated in this report, is essential and is assumed in the conclusion of this assessment.
2. There are no re-vegetation plans in respect to hazard vegetation and therefore the assumed fuel loading will not alter.
3. It is assumed that the building works will comply with the DTS provisions of the BCA including the relevant requirements of Australian Standard 3959 – 2018.
4. The proposed subdivision is constructed and maintained in accordance with the risk reduction strategy in this report.
5. The vegetation characteristics of the subject site and surrounding land remains unchanged from that observed at the time of inspection.

Limitations

1. The data, methodologies, calculations and conclusions documented within this report specifically relate to the proposed subdivision and must not be used for any other purpose.
2. A reassessment will be required to verify consistency with this assessment if there is any alterations and/or additions, or changes to the risk reduction strategy contained in this report.

Regards



Tim Mecham
Midcoast Building and Environmental

8.0 DISCLAIMER

This report is not intended for or to be used where aluminium composite panels are proposed. The report is not to be construed as an assessment of the building material or compliance with the recommended bushfire attack level/s.

9.0 REFERENCES

NSW Rural Fire Services, **Planning for Bushfire Protection**, 2019
AS 3959-2018 **Construction of Buildings in Bushfire Prone Areas**
Keith David 2004, Ocean **Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT**, Department of Environment and Conservation
NSW State Government (1997) Rural Fires Act 1997
NSW Rural Fire Service – **Guideline for Bushfire Prone Land Mapping 2002**

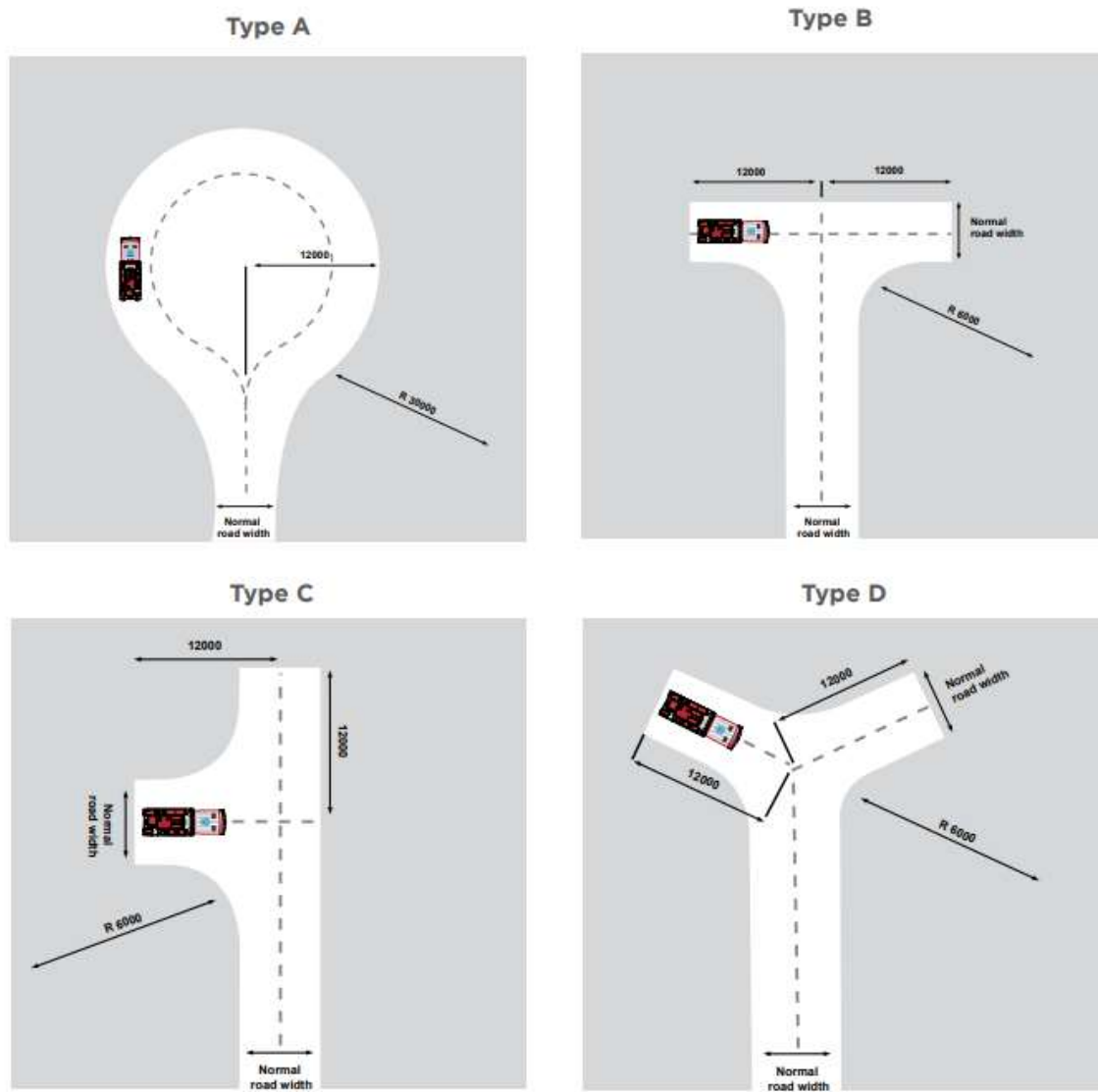
APPENDIX 1 – Proposed Subdivision Layout



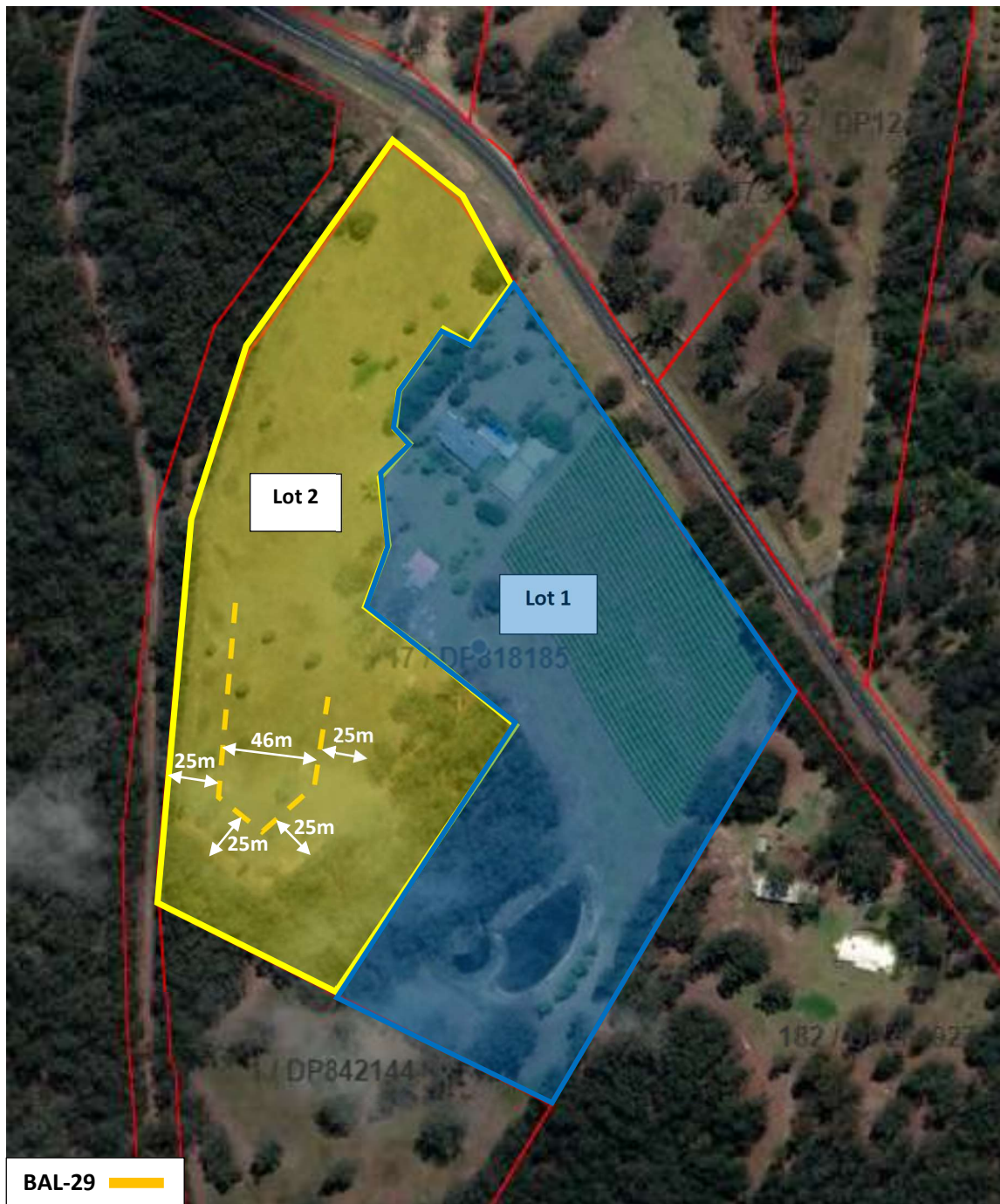
APPENDIX 2 – Turning Head Options

Figure A3.3



Multipoint turning options.



APPENDIX 3 – BAL 29 Contour Line



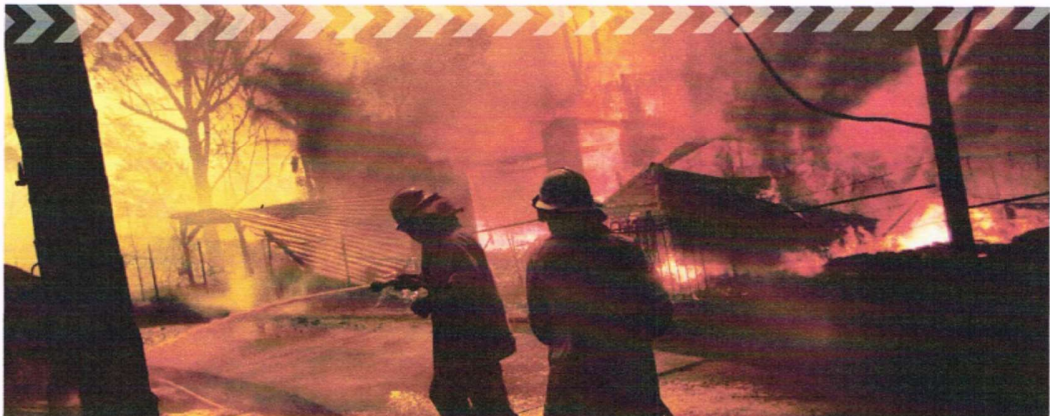
APPENDIX 4 – RFS Upgrading of Existing Buildings

**NSW RURAL FIRE SERVICE**

DEVELOPMENT ASSESSMENT & PLANNING

Upgrading of Existing Buildings

WORKING TOWARDS A SAFER COMMUNITY



INTRODUCTION

Bush fire is a major challenge for the community. It has been a natural part of our landscape for thousands of years and remains an ever-present threat.

Due to historic settlement patterns and the need to provide housing for people, development has occurred in areas that are bush fire prone placing lives and property at risk.

The NSW Rural Fire Service (NSW RFS) has a statutory obligation to protect life, property and the environment through fire suppression and fire prevention. Improved land use planning and construction of buildings in bush fire prone areas are intrinsic to the fire management strategies of the NSW RFS.

Through a working relationship with local Councils and the NSW Department of Planning, the NSW RFS has been able to refine and implement bush fire protection for new developments through the NSW

planning system. Since the introduction of these planning and building regulations in August 2002, all new development on bush fire prone land in NSW must comply with the requirements of *Planning for Bush Fire Protection 2006* and Australian Standard 3959-2009 – *Construction of buildings in bushfire-prone areas* (AS3959).

This means that people who are building or renovating have a clear direction on how to design and build their homes to be better protected from the impacts of bush fires. The types of protection measures include asset protection zones (vegetation management), access, landscaping, water supply, building design and construction. These measures assist building survival during a bush fire. They also contribute to the safety of fire-fighters and members of the community occupying buildings during the passage of a bush fire front.

Unfortunately, the majority of buildings in bush fire prone areas pre-date these regulations, meaning that most existing houses are at an increased risk of damage or loss from a bush fire.

BUSH FIRE INFORMATION LINE
1800 NSW RFS
1800 679 737
www.rfs.nsw.gov.au

NSW RFS DEVELOPMENT ASSESSMENT 0914

1/4

With this in mind, the NSW RFS has developed a practical guide for those living in bush fire prone areas who may wish to take the opportunity to upgrade their existing building to increase its resilience from bush fire attack.

The guide provides a range of options that homeowners may wish to consider in determining the level of protection appropriate for their circumstances and risk. These include minimal protection measures such as basic ember proofing, establishment of Asset Protection Zones (APZs) to higher level protection measures such as re-building or upgrading construction elements of the building.

While this guide identifies protection methods, it is vital that such building enhancements are considered in conjunction with any upgrade works undertaken, consideration of other bush fire protection measures such as maintenance of Asset Protection Zones, services and landscaping.

The guide is not intended to be a comprehensive bush fire assessment of the risk to your property or an indication of compliance with *Planning for Bush Fire Protection 2006* and AS3959-2009. In this regard, home owners are advised to seek professional advice with regards to further upgrades or reconstruction to improve their resistance to bush fire attack.

For further assistance, details regarding suitably qualified consultants can be found on the NSW RFS website www.rfs.nsw.gov.au

IS UPGRADING MANDATORY?

Upgrading of existing elements of the building to *Planning for Bush Fire Protection* is not mandatory. However, in the interests of achieving a better bush fire outcome, the NSW RFS strongly recommends improvement of existing elements including upgrade of buildings.

Anyone whose land is bush fire prone should have regard to this document for practical guidance in protecting your property against bush fire attack. For all new developments on bush fire prone land, following the Development Application process or the Exempt and Complying Development process, the advice in this document should be applied as a minimum standard to the existing situation. This is in addition to any other bush fire protection measures that may be required by the development consent or complying development certificate.

These upgrading measures will contribute to making your home safer against the impact of the different elements of attack in the event of a bush fire; however, they form only part of the solution. Undertaking routine property maintenance and preparing a Bush Fire Survival Plan are other important parts to your bush fire protection and survival.


UPGRADE PROVISIONS

85% of houses are lost from ember attack. The following provisions are designed to give existing buildings improved protection from ember attack during a bush fire event. Ember attack can occur over distances greater than 100 metres from the bush fire front. Any gaps, cracks or areas where embers and fuel can lodge (leaves, twigs, debris) significantly reduces a building's resistance to bush fire attack.

To mitigate against ember attack you should consider the minimal upgrades as detailed in the table below. Additional protection measures may also be considered and this will be dependent on the individual circumstances of the building commensurate with the level of threat from bush fire attack. The potential level of threat to the property from bush fire attack should also be taken in to account when deciding what level of protection should be used. Factors to be taken in to consideration include the isolation of the development and how easily you can react in the event of a bush fire.

Owners are cautioned that existing buildings may contain materials made from asbestos or have painted surfaces that contain lead. These materials should be handled in accordance with appropriate guidelines.





BUILDING ELEMENT	MINIMAL PROTECTION MEASURES	ADDITIONAL PROTECTION MEASURES
GENERAL	Seal all gaps (>3mm) around the house (excluding subfloor) with: <ul style="list-style-type: none"> • appropriate joining strips; • flexible silicon based sealant; or • mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminium. 	<ul style="list-style-type: none"> • Install a bush fire sprayer system. (Please contact a bush fire consultant or relevant industry expert to discuss options) Seal all gaps (>3mm) around the house (excluding subfloor) with: <ul style="list-style-type: none"> • appropriate joining strips • flexible silicon based sealant; or mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminium.
WALLS	Install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding when they are being replaced for maintenance or other reasons.	<ul style="list-style-type: none"> • Replace wall materials with non-combustible materials • Install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding.
SUBFLOOR	Removal of combustible materials and keeping areas clear and accessible.	<ul style="list-style-type: none"> • Enclose subfloor with non-combustible material.
DOORS	Install weather strips, draught excluders or draught seals at the base of side-hung doors.	<ul style="list-style-type: none"> • Replace external doors with non-combustible or solid timber doors with minimum thickness of 35mm. • Replace or over-clad parts of door frames less than 400mm above the ground, decks and similar elements or fittings with non-combustible material. • Install weather strips, draught excluders or draught seals at the base of side-hung doors.
VENTS & WEEPHOLES	Seal vents and weepholes in external walls with mesh (with an aperture size of 2 mm) of corrosion resistant steel, bronze or aluminium.	<ul style="list-style-type: none"> • Seal vents and weepholes in external walls with mesh (with an aperture size of 2 mm) of corrosion resistant steel, bronze or aluminium.
ROOFS	Seal around roofing and roof penetrations with a non-combustible material. Install sarking with a flammability index of not more than 5 beneath existing roofing when it is being replaced for maintenance or other reasons. If installed, gutter and valley leaf guards shall be non-combustible.	<ul style="list-style-type: none"> • Replace fascia and roof materials with non-combustible materials. • Seal around roofing and roof penetrations with a non-combustible material. • Install sarking with a flammability index of not more than 5 beneath existing roofing. • If installed, gutter and valley leaf guards shall be non-combustible.
WINDOWS	Install mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminium to all external doors and openable windows	<ul style="list-style-type: none"> • Installing appropriately tested shutters to doors and windows • Install mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminium to all external doors and windows • Replacing glass with toughened or laminated safety glass • Replace overhead glazing with 'grade a' safety glass
EXTERNAL STRUCTURES		<ul style="list-style-type: none"> • External structures to be located >10 metres from the main dwelling.
DECKING		<ul style="list-style-type: none"> • Replace decking with non-combustible material



OTHER REQUIREMENTS

ASSET PROTECTION ZONES

Development on bush fire prone land requires suitable separation from the bush fire hazard. This separation is referred to as an asset protection zone (APZ) and should be located wholly within the development property.

The APZ separates the building from the hazard. It is designed to minimize the presence of fuels, which could burn in a fire. Therefore, the impact of direct flame contact, radiant heat and ember attack on the development is reduced.

In order to ensure appropriate levels of safety, the NSW RFS recommends that an APZ is always provided. Where a building has been newly developed or alterations and additions have been undertaken, recommended levels of construction are reliant upon the ongoing maintenance of the APZ. In this regard, the suitability of the design and construction of the building will be significantly compromised should the APZ not be maintained or implemented as intended.

APZ should be managed in accordance with section 4.1.3 and Appendix 5 of 'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document *Standards for asset protection zones*.

SERVICES

During major bush fire events, the preparedness of the dwelling and its occupants may be seriously jeopardised with the loss of basic services, particularly water and electricity.

Adequate water supply is critical for any firefighting operation, particularly where property protection is envisaged. A reticulated water supply should be provided which is easily accessible and located at regular intervals. Where no reticulated water supply is available, a water supply of 5,000L reserve (i.e. water tank or dam) dedicated to firefighting purposes should be installed and maintained.

Electricity services should be located so that the possibility of ignition of the surrounding bushland or fabric of the buildings is limited. Regular inspection of the electricity lines should be undertaken to ensure they are not impacted by branches.

The location of gas services should vent facing away and not lead to the ignition of surrounding bushland or the fabric of the buildings.

LANDSCAPING

Vegetation can burn during a bush fire. With this in mind, careful attention must be paid to species selection, their location relative to their flammability, avoidance of continuity of vegetation (horizontally and vertically), and ongoing maintenance to readily remove flammable fuels (leaf litter, twigs and debris).

Homeowners are advised to contact their local Council before undertaking any work that involves modifying or removing existing trees.

The following additional information relating to landscaping is available at www.rfs.nsw.gov.au:

1. Standards for Asset Protection Zones
2. Appendix 5 of *Planning for Bush Fire Protection 2006*.



For more information please visit www.rfs.nsw.gov.au
or contact Development Assessment & Planning on **8741 5175**
or email development.assessment@rfs.nsw.gov.au.