



BUSHFIRE THREAT ASSESSMENT

**FOR
PROPOSED DEMOLITION AND
CONSTRUCTION OF A NEW FACILITY
FOR
BLAYNEY HOSPITAL**

**AT
3 OSMAN STREET,
BLAYNEY NSW 2799**

Prepared by:

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Disclaimer

Notwithstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

Executive Summary

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of APP Group for proposed demolition and construction of a new facility at the Blayney Hospital 3 Osman Street, Blayney NSW 2799. The report forms part of the supporting documentation for a Review of Environmental Factors (REF) prepared by Health Infrastructure NSW.

The proposal is for the demolition and construction of a new facility at Blayney Hospital, and as such, must meet the requirements of a Special Fire Protection Purposes (SFPP) development in accordance with Planning for Bushfire Protection 2019 (PBP 2019) (NSW RFS, 2019). The report demonstrates compliance with PBP 2019 and AS3959-2018 Construction of Buildings in Bush Fire Prone Areas.

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal. Recommendations are provided with regard to fuel management, access, provision of emergency services, building protection and construction standards to facilitate an acceptable level of bushfire protection.

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements for the proposed development:

- The proposed demolition and construction of a new facility has been assessed as BAL-LOW from all elevations.
- A Bush Fire Emergency Management and Evacuation Plan will be Prepared. Maps showing emergency assembly areas outlined in this plan should be clearly displayed, and an Emergency Planning Committee is to be established.

I certify the development conforms to the relevant specifications and requirements of Planning for Bushfire Protection 2019



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Terms & Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BFPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BFSA	Bush Fire Safety Authority
BSC	Blayney Shire Council
CC	Construction Certificate
<i>EPA Act</i>	<i>NSW Environmental Planning and Assessment Act 1979</i>
FFDI	Forest Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2019
PoM	Plan of Management
REF	Review of Environmental Factors
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation



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I INTRODUCTION

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of APP Group for proposed demolition and construction of a new facility at the Blayney Hospital at 3 Osman Street, Blayney NSW 2799, hereafter referred to as the “site” (refer to Figure 1-1 for site locality). Refer to Appendix A for Proposed Site Plans.

The proposal is for demolition and construction of a new hospital facility, and as such, must meet the requirements of a Special Fire Protection Purposes (SFPP) development in accordance with Planning for Bushfire Protection 2019 (PBP 2019) (NSW RFS, 2019).

This BTA is suitable for submission with a REF and provides information on measures that will enable the development to comply with ‘Planning for Bushfire Protection’ (NSW RFS, 2019), hereafter referred to as PBP (RFS, 2019).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the Environmental Planning and Assessment Amendment (Planning for Bushfire Protection) Regulation 2007 and the Rural Fires Amendment Regulation 2007 (RF Amendment Regulation 2007).

I.1 Site Particulars

Locality:	3 Osman Street, Blayney NSW 2799
LGA:	Blayney Shire Council
Current Land Use:	Existing Hospital
Forest Danger Index:	80 FFDI

Figure 1-1: Site Location





I.2 Description of the Proposal

This REF relates to the proposal for demolition and construction of a new facility at the Blayney Hospital. Refer to Appendix A for proposed plans.

I.3 Legislative Requirements

The Site has not been mapped as Bush Fire Prone Land Map (BFPLM) by BSC, however this Bushfire Assessment Report has been undertaken as a precautionary measure. Refer to Figure 1-2 for Bushfire Prone Land Map.

This report forms part of the supporting documentation for a REF to be submitted to BSC.

This BTA has been prepared using current legislative requirements and associated guidelines for assessment of bushfire protection, these being:

- PBP (RRS, 2019); and
- AS3959-2018 Construction of Buildings in Bushfire Prone Area.

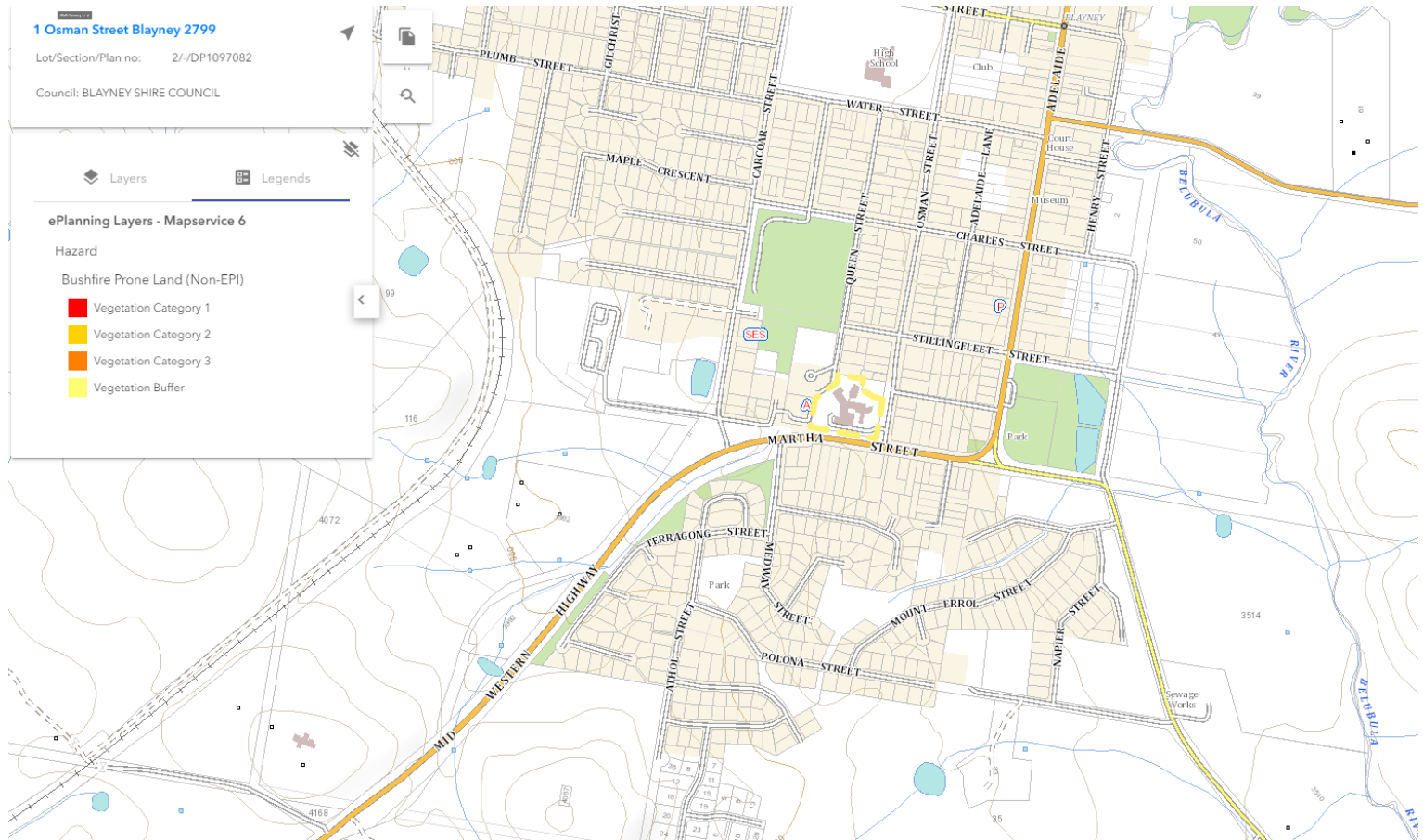
The proposal is for the demolition and construction of a new facility at Blayney Hospital, and as such, must meet the requirements of a Special Fire Protection Purposes (SFPP) development in accordance with PBP 2019.

I.4 Objectives of Assessment

This report has been prepared to address the requirements of Clause 44 of the Rural Fires Regulation. This BTA also addresses the six key Bush Fire Protection Measures (BFRMs) in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced APZ (and their components being Inner Protection Areas (IPA's) and Outer Protection Areas (OPA's);
- Sitting and design of the proposal;
- Construction standards;
- Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;
- Adequate water supply and pressure, and utility services; and
- Suitable landscaping, to limit fire spreading to a building.

Figure 1-2: Bushfire Prone Land Map





2 METHODOLOGY

2.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent
- Confirmation of the vegetation assemblage typology present.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 2m.



3 SITE ASSESSMENT

The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2019).

3.1 Vegetation & Slope Assessment

In accordance with PBP (RFS 2019), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. This assessment is depicted in Table 3-1 and Figure 3-1 that shows the vegetation post development.

In accordance with PBP (RFS 2019), an assessment of the slope underneath the vegetation considered a bushfire hazard was undertaken and the results are presented in Table 3-1 and Figure 3-1 below.

Table 3-1: Vegetation Classification

Proposed Demolition and Construction of a New Facility		
Direction	Vegetation Type	Slope
North	Managed Land	N/A
East	Managed Land	N/A
South	Managed Land	N/A
West	Managed Land	N/A



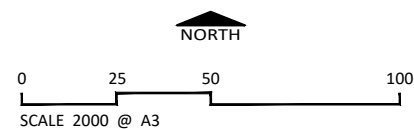
FIGURE 3-1: VEGETATION MAP

CLIENT
SITE DETAILS
DATE

Client
No.1 Osman Street Blayney
9 November 2022

Legend

- Subject Site
- 140m Buffer
- Managed Land



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4 BUSHFIRE ATTACK ASSESSMENT

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer / architect should be made aware of this recommendation. It may be necessary to have dwelling plans checked by the architect involved to ensure that the proposed dwellings meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2018.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FFDI = 80
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**

There is insufficient risk to warrant any specific construction requirements but there are still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**

There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m².

(c) **BAL – 19** The risk is considered to be **MODERATE**

There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m².

(d) **BAL-29** The risk is considered to be **HIGH**

There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.



The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m².

(e) **BAL-40** The risk is considered to be **VERY HIGH**

There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m².

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux greater than 40 kW/m².

4.1 Determination of Bushfire Attack Levels

By applying an FFDI of 80 and the information relating to vegetation and slope to Table A1.12.6 of PBP 2019, the appropriate BAL rating was determined. The results from this bush fire risk assessment are detailed below in Table 4-1–Bush Fire Attack Assessment and Figure 4-1 shows the vegetation.

Table 4-1: Determination of BALs for the Proposed Demolition and Construction of a New Facility

Vegetation Type & Direction	Separation Distance from vegetation	Bushfire Attack Level (BAL)
Managed Land to the North	>100m	BAL-LOW
Managed Land to the East	>100m	BAL-LOW
Managed Land to the South	>100m	BAL-LOW
Managed Land to the West	>100m	BAL-LOW

Given the information in Table 4-1, the proposed demolition and construction of a new facility has been assessed as **BAL-LOW**.



5 COMPLIANCE

The proposal is for an SFPP development and therefore development standards apply. Table 5-1 details compliance with Development Standards for SFPP Developments.

Table 5-1: Proposed Compliance with SFPP Development Standards

Acceptable Solutions	Performance Criteria	Compliance with PBP
ASSET PROTECTION ZONES		
> the building is provided with an APZ in accordance with PBP 2019 (Table A1.12.1 in Appendix 1).	> radiant heat levels of greater than 10kW/m ² (calculated at 1200K) will not be experienced on any part of the building.	Complies with Acceptable Solution - the building is provided with an APZ in accordance with PBP 2019 (Table A1.12.1 in Appendix 1). This APZ is already established and maintained as managed land.
> APZs are located on lands with a slope less than 18 degrees.	> APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Complies with Acceptable Solution - APZs are located on lands with a slope less than 18 degrees.
> 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; > 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.	> APZs are managed and maintained to prevent the spread of fire to the building. > the APZ is provided in perpetuity	Complies with Acceptable Solution - the APZ is already established and maintained, and is managed in accordance with the requirements of Appendix 4 of PBP 2019.



LANDSCAPING

› landscaping is in accordance with Appendix 4; and › fencing is constructed in accordance with section 7.6.	› landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Can comply with Acceptable Solution - landscaping is to be in accordance with Appendix 4 of PBP 2019, and fencing is to be constructed in accordance with section 7.6 of PBP 2019.
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CONSTRUCTION STANDARDS

› a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied.	› the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	Complies with Acceptable Solution - The proposed development complies with BAL-LOW.
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ACCESS

› 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	› firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Complies with Acceptable Solution - the SFPP development is connected to Osman Street via a driveway <10m in length. Osman Street is a sealed, two-wheel drive, all-weather public road.
› 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.	› the capacity of access roads is adequate for firefighting vehicles.	Complies with Acceptable Solution - the SFPP development is connected to Osman Street via a driveway <10m in length. Osman Street is a sealed, two-wheel drive, all-weather public road.



› hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; › hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; and › there is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available.	› there is appropriate access to water supply.	Complies with Acceptable Solution - Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005
PERIMETER ROADS		
› there are two-way sealed roads; › minimum 8m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are to be located clear of parking areas; › there are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the maximum grade road is 15 degrees and average grade of not more than 10 degrees; › the road crossfall does not exceed 3 degrees; and › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	› perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	N/A - The proposed SFPP development does not require perimeter roads.



NON-PERIMETER ROADS		
> minimum 5.5m carriageway width kerb to kerb; > parking is provided outside of the carriageway width; > hydrants are located clear of parking areas; > there are through roads, and these are linked to the internal road system at an interval of no greater than 500m; > curves of roads have a minimum inner radius of 6m; > the maximum grade road is 15 degrees and average grade of not more than 10 degrees; > the road crossfall does not exceed 3 degrees; and > a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	> non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating.	Complies with Acceptable Solution - the SFPP development is connected to Osman Street via a driveway <10m in length. Osman Street is a sealed, two-wheel drive, all-weather public road.
WATER SUPPLY		



› reticulated water is to be provided to the development, where available; or › a 10,000 litres minimum static water supply for firefighting purposes is provided for each occupied building where no reticulated water is available.	› an adequate water supply for firefighting purposes is installed and maintained.	Complies with Acceptable Solution - Reticulated water is provided to the development.
› fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; › hydrants are not located within any road carriageway; and › reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.	› water supplies are located at regular intervals. › the water supply is accessible and reliable for firefighting operations.	Complies with Acceptable Solution - Fire hydrant spacing and design complies
› fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	› flows and pressure are appropriate.	Complies with Acceptable Solution - Assumed to comply
› all above-ground water service pipes external to the building are metal, including and up to any taps.	› the integrity of the water supply is maintained.	Complies with Acceptable Solution - Assumed to comply
› 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; › a hardened ground surface for truck access is supplied within 4m of the access hole;	› water supplies are adequate in areas where reticulated water is not available	Complies with Acceptable Solution - Assumed to comply



› 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 provided at all times; › 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; and › 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 2441:2005 <i>Installation of fire hose reels</i>.		
ELECTRICITY SERVICES		
› where practicable, electrical transmission lines are underground; › where overhead, electrical transmission lines are proposed as follow: ○ lines are installed with short pole spacing (30m), unless crossing	› location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Complies with Acceptable Solution - Electrical transmission lines installed where practical.



gullies, gorges or riparian areas; and ○ no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.		
GAS SERVICES		
› 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; › 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 to gas meters adjacent to buildings are not to be used; and › above-ground gas service pipes external to the building are metal, including and up to any outlets.	› location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Can Comply
EMERGENCY MANAGEMENT		



> Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: ○ The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; ○ NSW RFS Schools Program Guide; ○ Australian Standard AS 3745:2010 Planning for emergencies in facilities; and ○ Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable). ○ the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	> a Bush Fire Emergency Management and Evacuation Plan is prepared.	Complies with Acceptable Solution - Bush Fire Emergency Management and Evacuation Plan will be prepared for development.
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> 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.	> appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan.	Complies with Acceptable Solution – as the proposed hospital includes a residential aged care unit, an emergency planning committee is to be established with detailed plans of emergency procedures.
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6 CONCLUSION & RECOMMENDATIONS

In summary, a Bushfire Threat Assessment has been undertaken for proposed demolition and construction of a new facility at Blayney Hospital at 3 Osman Street, Blayney NSW 2799. The report forms part of the supporting documentation for a REF to be submitted to BSC.

If the recommendations contained within this report are duly considered and incorporated, it is considered that the fire hazard present is containable to a level necessary to provide an adequate level of protection to life and property on the subdivision. In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements for the proposed development:

- The proposed demolition and construction of a new facility have been assessed as BAL-LOW from all elevations.
- A Bush Fire Emergency Management and Evacuation Plan will be Prepared. Maps showing emergency assembly areas outlined in the plan should be clearly displayed, and an Emergency Planning Committee is to be established.

**I certify the development conforms to the relevant specifications and requirements of
Planning for Bushfire Protection 2019**



7 BIBLIOGRAPHY

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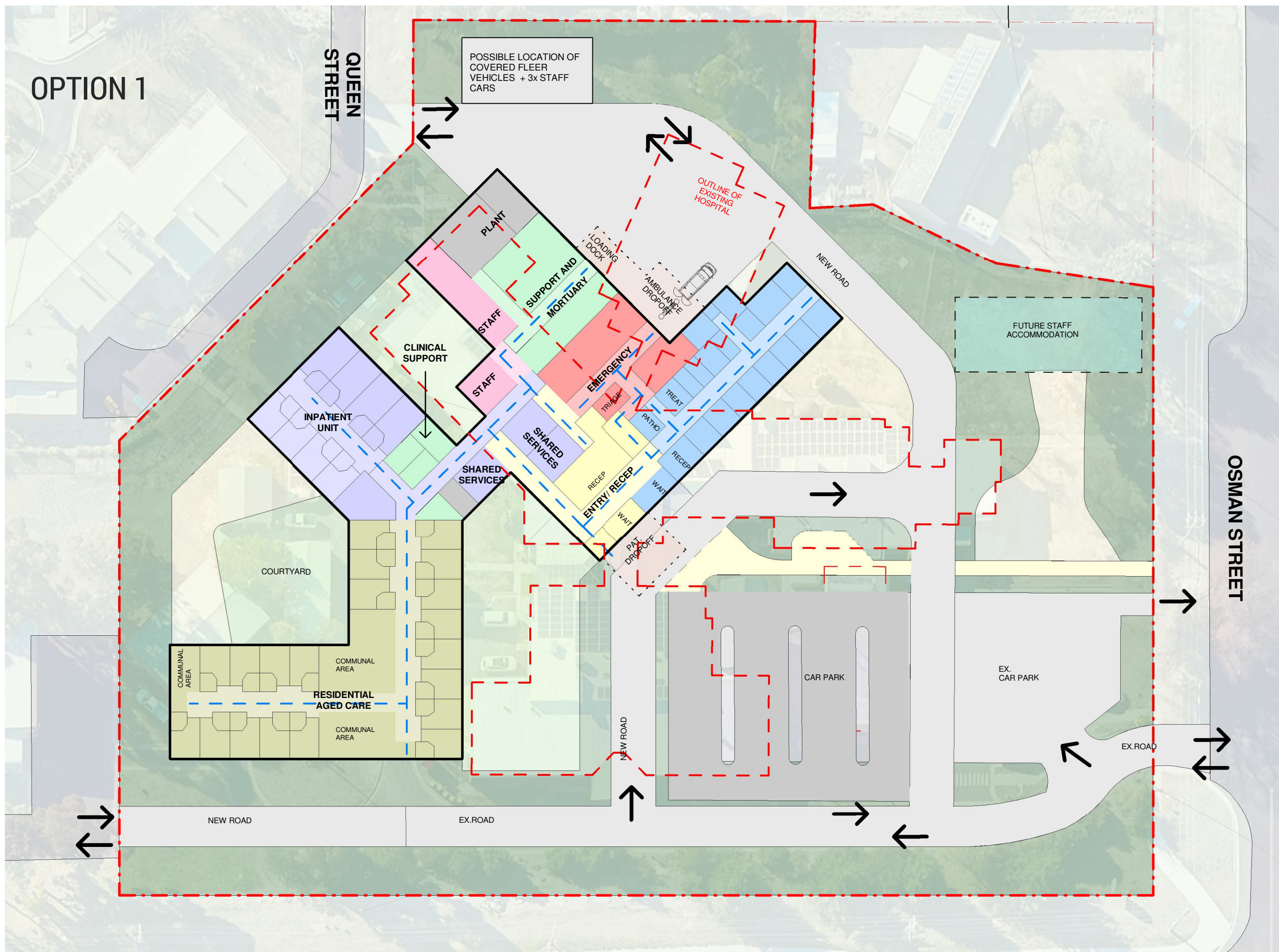
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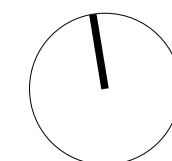
APPENDIX A PROPOSED SITE PLANS

OPTION 1

NBRS



- ENTRY/ WAIT/ RECEPTION /ADMIN
- STAFF AMENITIES
- EMERGENCY SERVICES
- INPATIENT SERVICES
- SHARED SERVICES
- RESIDENTIAL AGED CARE
- HEALTHONE
- CLINICAL SUPPORT
- NON CLINICAL SUPPORT AND MORTUARY
- PLANT & ENGINEERING
- STAFF ACCOMMODATION
- CORRIDOR
- BUILDING LINKS
- REFURBISHMENT
- RETAIN
- POTENTIAL FUTURE EXPANSION



APPENDIX B ASSET PROTECTION ZONES

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMS, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

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

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

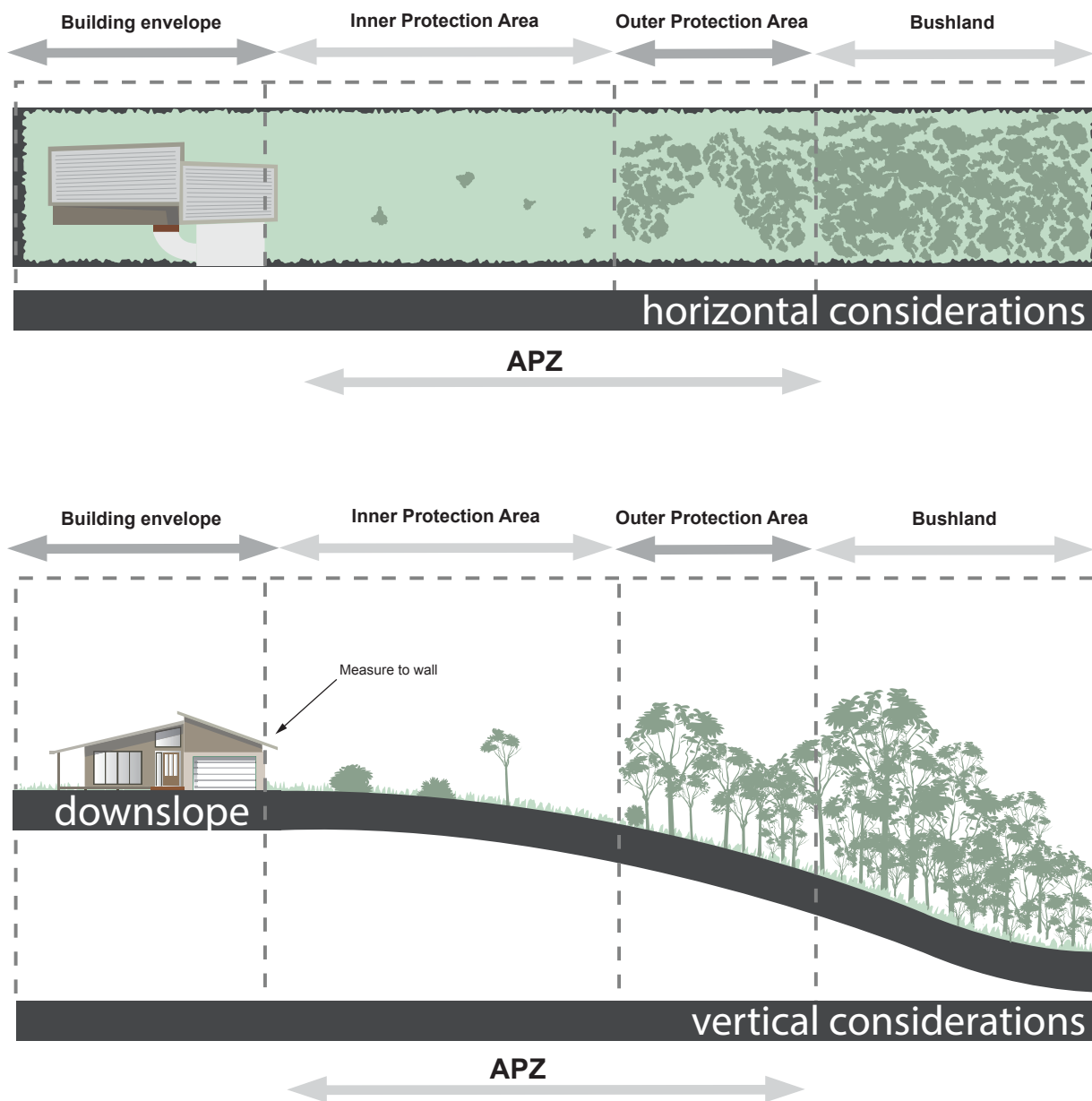
- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

Figure A4.1

Typical Inner and Outer Protection Areas.



A4.1.1 Inner Protection Areas (IPAs)

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

- create 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.

A4.1.2 Outer Protection Areas (OPAs)

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 bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

APPENDIX C SITE PHOTOS





