

Firefront Bushfire Consulting

BUSHFIRE ASSESSMENT REPORT

Alterations and Additions to Proposed Community Centre

682 Castlereagh Road Agnes Banks, NSW 2753.



Client: Rick Shah

*Address: 682 Castlereagh Road
Agnes Banks, NSW 2753*

Date: 27 August 2017

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BPAD Accreditation #36861



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1.0 INTRODUCTION

Fire front Bushfire Consulting has been engaged by Rick Shah to provide a bushfire hazard assessment for the proposed alterations and additions to the existing dwelling located at 682 Castlereagh Road Agnes Banks. It is proposed to convert the existing dwelling to a Community Centre.

This bushfire assessment report is provided to assist Penrith City Council to determine a Development Application for the proposed works.

The proposed works are classified as Class 10a and Class 9b buildings under Part 1.3.2 BCA Volume 2.

1.1 PURPOSE OF THIS REPORT

- To ascertain the threat level the subject buildings are likely to be exposed to during a bushfire event.
- To assess the proposed works as submitted for consideration under a Development Application with Penrith City Council against the requirements of *Planning for Bushfire Protection 2006, Australian Standard 3959-2009 including Addendum Appendix 3 and AS3929-2009 "Construction of Buildings in Bushfire Prone Areas"*
- To advise the owner of construction standards for the proposed works.
- To advise the owner of where the proposed works comply or do not comply with *Planning for Bushfire Protection 2006 and AS3959-2009*
- Identify nearest bushfire prone land, vegetation on both the subject and adjoining lands and identify expected bushfire behaviour impacting on the subject works
- Provide advice to the owners on potential measures that may improve but not guarantee the buildings chances of survival during a bushfire event.

1.2 SCOPE OF THIS REPORT

This report is limited to the construction requirements and bush fire risk associated with the proposed alterations and additions only. This report does not address the requirements for the existing dwelling or any surrounding land, however consideration is given regarding the impact the surrounding land has on the subject works. The report will, however identify the Bushfire Attack Level the proposed addition will be exposed to.

1.3 REGULATORY CONTROLS

An assessment has been made against the requirements of the *NCC Building Code of Australia 2016, Environmental Planning and Assessment Act 1979 (Section 79BA), Planning for Bushfire Protection 2009 and AS3959-2009 including Appendix 3.*

1.4 METHODOLOGY

A site visit was carried out on Saturday the 26th August 2017. The methodology as determined by AS3959-2009 Appendix C “Process and Procedure for Determining the Bushfire Attack Level”, Section 2 AS3959-2009 “Determining the Bushfire attack Level” and “Planning for Bushfire Protection” Appendix 2 “Determining Asset Protection Zones” were utilised.

1.5 THE PROPOSAL

The proposal is for the addition of a large covered area to the existing building and enclosing the existing carport.

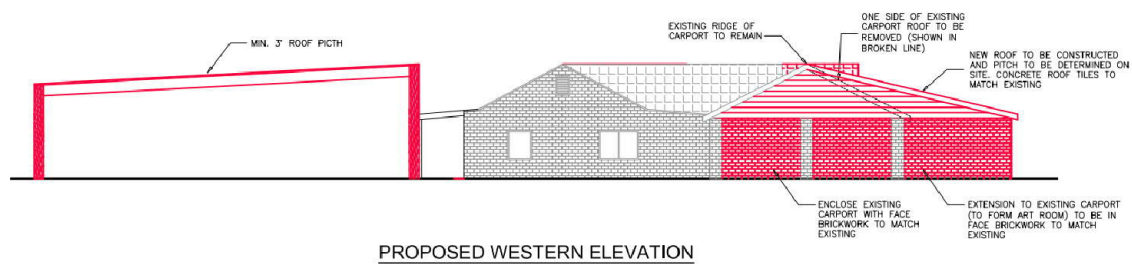


FIGURE 1.0: EXISTING DWELLING AND PROPOSED CHANGES INDICATED IN RED

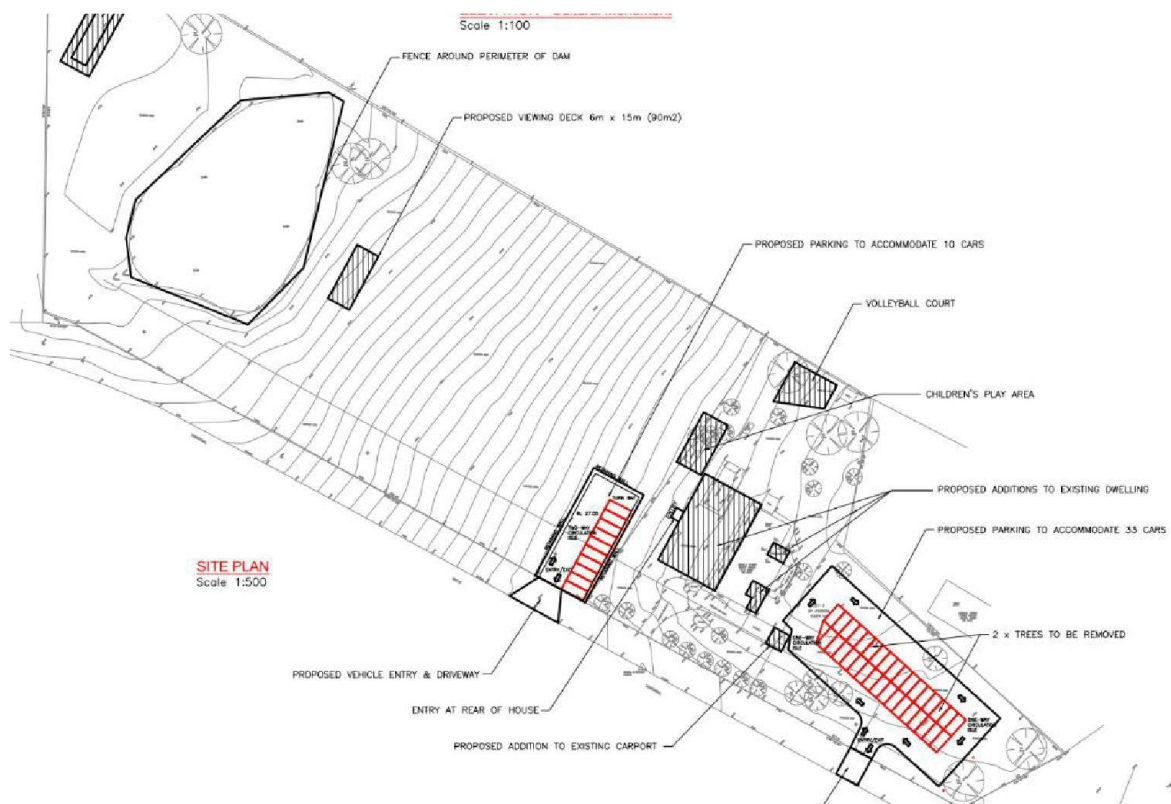


FIGURE 1.2 SITE PLAN SHOWING PROPOSED ALTERATIONS AND ADDITIONS

2.0 Site and Adjacent Developments

2.1 DESCRIPTION OF THE SITE

The site consists of a 20,000 square metre lot situated on the Western side of Castlereagh Road. The lot is legally known as Lot 2 DP 252556. The site is gently sloping to the west, free of existing natural vegetation. The entire site although at present vacant and somewhat overgrown, has a history of continuous management. The site is zoned Ru1 under Penrith City Council's Local Environment Plan. Reticulated water supply is available with a Hydrant being located within 60m of the development.

The site is generally- surrounded on three sides by managed land with turf farms featuring predominantly in the immediate vicinity.



FIGURE 2.1 SIX MAPS IMAGE SHOWING THE SUBJECT SITE OF PROPOSED DEVELOPMENT

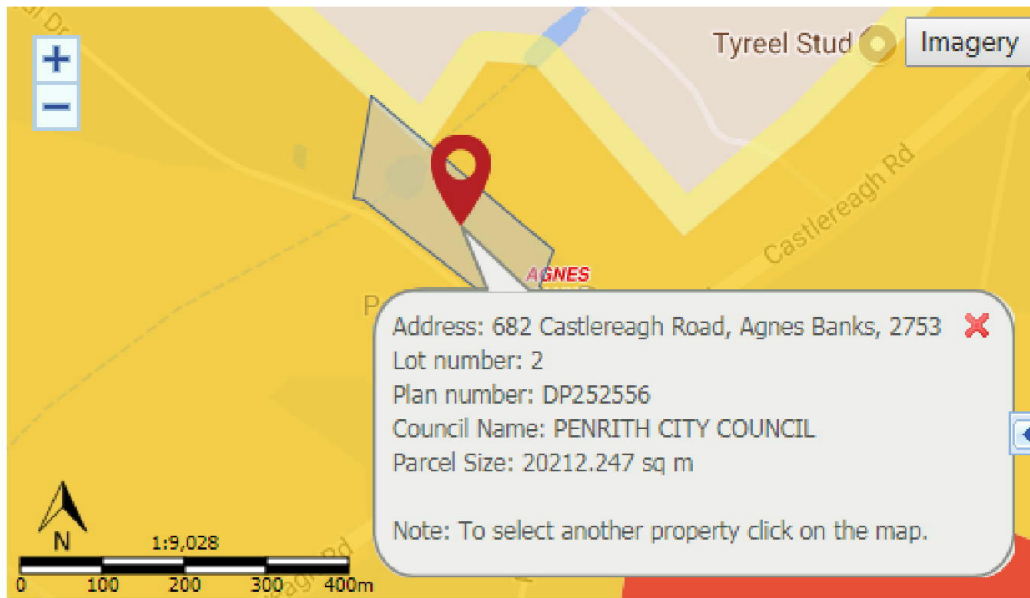


FIGURE 2.2 EX E-PLANNING NSW GOVERNMENT DEPARTMENT OF PLANNING

2.2 DESCRIPTION OF SURROUNDING LANDS

The site is surrounded by predominantly Rural lots of a comparable size to the site. The majority of the adjoining and surrounding lots are well managed being used for turf farming. The site is not directly connected to any significantly large areas of natural forest.

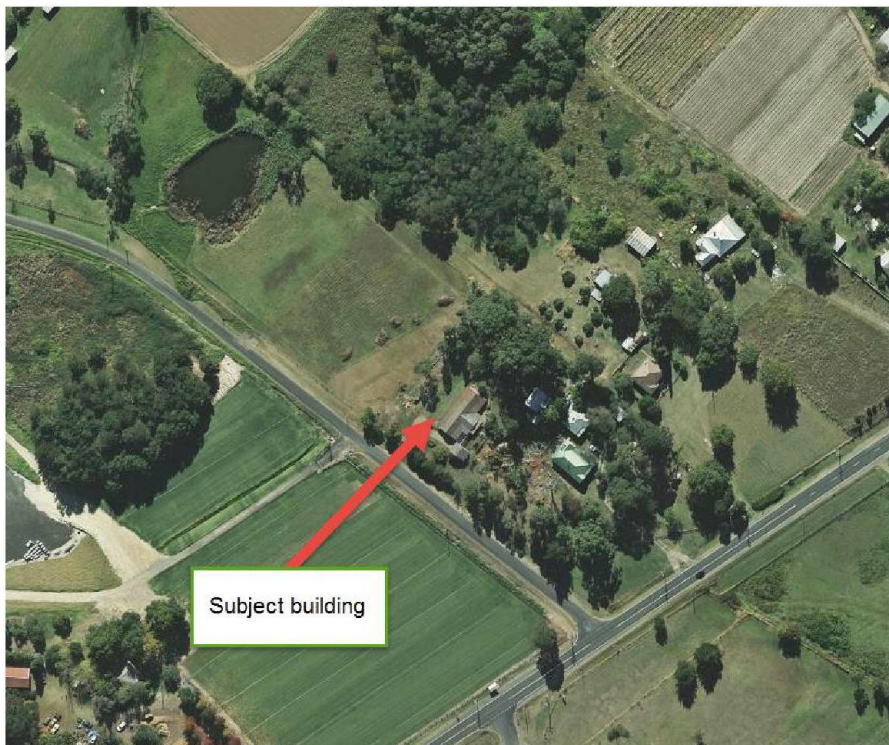


FIGURE: 2.2 SURROUNDING LAND USE.

3.0 Environmental considerations

The proposed works do not pose a threat to any native habitat.

4.0 Bushfire Hazard Assessment

The Rural Fire Service and Penrith City Council (Bushfire Prone land mapping) has designated the land as bushfire prone land consisting of Vegetation Category 1 and buffer zone (Light yellow areas in figure 4.0), therefore the development must comply with *Section 79BA* of the *EP&A Act 1979*. This part of the act requires any development on bushfire prone land to comply with *Planning for Bushfire Protection 2006*. See excerpt of RFS Bush fire Prone Land Map below.

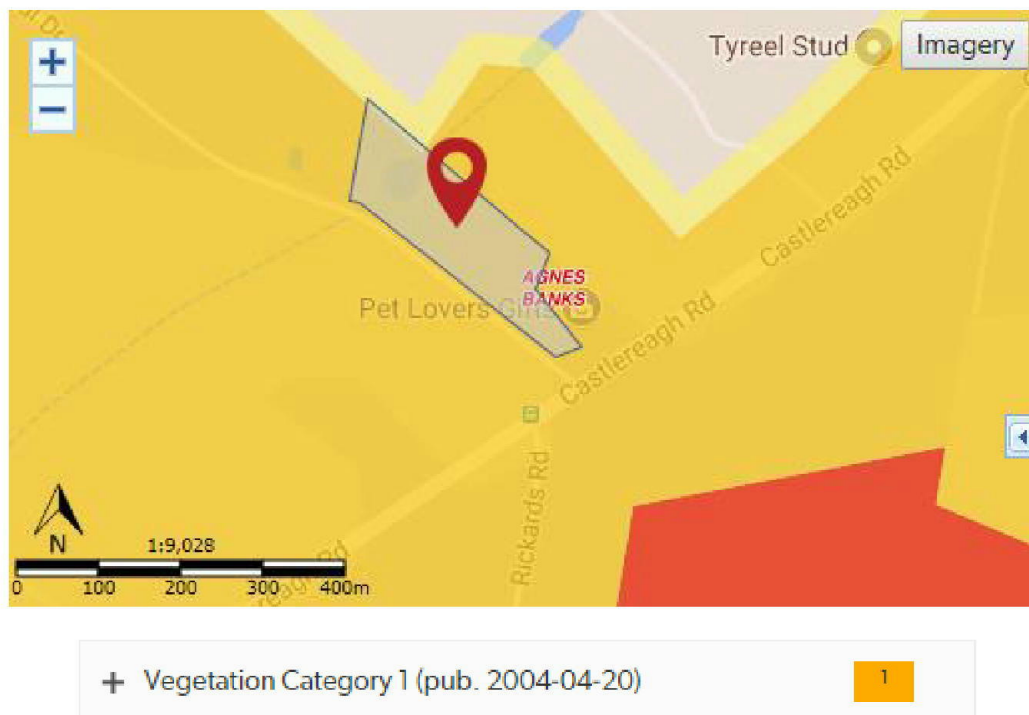


FIGURE 4.0 BUSHFIRE PRONE LAND MAP

Further consideration must be given to the legislative requirements of Section 79c of the EP&A Act 1979. It is here that legislative weight is given to the Building code of Australia and subsequently Australian Standard AS3959-2009 as a referenced document.

Planning for Bushfire Protection Addendum Appendix 3 and Section 2 AS3959-2009 Provides a methodology for determining the bushfire attack level (BAL) for a site. An assessment was undertaken for the proposed alterations and additions in accordance with this methodology.

STEP 1: DETERMINE THE FDI FOR THE SITE

State/region	FDI
Australian Capital Territory	100
New South Wales	
(a) Greater Hunter, Greater Sydney, Illawarra/Shoalhaven, Far South Coast and Southern Ranges fire weather districts	100
(b) NSW alpine areas	50
(c) NSW general (excluding alpine areas, Greater Hunter, Greater Sydney, Illawarra/Shoalhaven, Far South Coast and Southern Ranges fire weather districts)	80

FIGURE 4.1: FDI TABLE 2.1 EX AS3959-2009

Given the site is located in the greater Sydney region table 2.1 determines the FDI to be 100

STEP 2 CLASSIFY THE VEGETATION

The vegetation was assessed out to a distance of 140m in accordance with A3.5 of Addendum Appendix 3 PBP. The vegetation type was determined by Table 2.3 and Figures 2.4

The vegetation located to the West (area A), North (area B), East (area C) and South (area D) were all classified as managed land. An area of Woodland was located to the North designated Area E below.

**FIGURE 4.2 VEGETATION CLASSIFICATION**

Bushfire Risk Assessment 682 Castlereagh Road Agnes Banks. NSW 2753.

The area of managed land located in area B in figure 4.2 on previous page was not considered assessable vegetation under Clause 2.3.2. This Clause provides a method to exclude certain vegetation from inclusion as a bushfire threat.



IMAGE 5: MANAGED LAND LOCATED TO THE WEST AREA (A) FIGURE 4.2 ON PREVIOUS PAGE



IMAGE 6: MANAGED LAND LOCATED TO THE NORTH AREA (B) FIGURE 4.2 ON PREVIOUS PAGE



IMAGE 7: MANAGED LAND LOCATED TO THE EAST (AREA C) FIGURE 4.2 ON PAGE 8 OF THIS REPORT



IMAGE 8: MANAGED LAND LOCATED TO THE SOUTH (AREA D) FIGURE 4.2 ON PAGE 8 OF THIS REPORT



IMAGE 9: WOODLAND LOCATED NORTH BEYOND MANAGED LAND

STEP 3 DISTANCE TO VEGETATION

The vegetation was assessed out to a distance of 140 m in accordance with Planning for Bushfire Protection appendix 3 A3.5.

Clause A 2.2.3.2 of AS3959-2009 and Clause 2.2.3.2 provides exemptions for certain types and areas of vegetation. One of the scenarios where vegetation can be excluded is where grassland is managed to a height of less than 100 mm. In this regard managed land existed or could potentially exist within the confines of the property and to the north of the adjoining boundary.

An area of woodland existed beyond the managed land located on the adjoining land. The woodland was located 28 metres from the boundary fence. The boundary was located 38 metres from the proposed covered area.

	Downslope >5 to 10 degrees				
A. Forest	<31	31-<39	39-<53	53-<69	69-<100
B. Woodland	<20	20-<26	26-<37	37-<50	50-<100
C. Shrubland	<8	8-<11	11-<17	17-<25	25-<100
D. Scrub	<12	12-<17	17-<24	24-<35	35-<100
E. Mallee/Mulga	<7	7-<10	10-<15	15-<23	23-<100
F. Rainforest	<13	13-<18	18-<26	26-<36	36-<100
G. Grassland	<8	8-<11	11-<17	17-<25	25-<50

FIGURE 2.4.2 AS3959-2009 (IN PART)

When assessed against Table 2.4.2 above and below the alterations and additions would be given a BAL rating of BAL 12.5. The Class 10 covered area is located 65 m from the assessed woodland and is therefore not required to comply with AS3959-2009.

4.2 Slope Assessment:

The slope under the woodland was assessed as 5-10 degrees.

4.3 CATEGORY OF BUSHFIRE ATTACK:

Section 2 Clause 2.2.6 of AS3959-2009 requires the development be assessed against Table 2.4.2 (Given the FDI 100 rating of the area)

Using the information gathered during the desktop and site assessment the development has been assessed as having a bushfire attack level of BAL 12.5.

5.0 Compliance with Chapter 4 of Planning for Bushfire Protection 2006

The proposed alterations and additions are considered infill development. Planning for Bushfire Protection Part 4.3 requires infill developments to comply with the service supply and APZ requirements of Part 4.1 (Residential and Rural subdivision requirements) within the constraints of the existing siting and infrastructure.

5.1 ASSET PROTECTION ZONES

Bushfire Risk Assessment 682 Castlereagh Road Agnes Banks. NSW 2753.

The site and surrounding lands have a history of being managed in line with the definition as defined in AS3959-2009. All asset protection zones comply with the maximum slope requirements of Appendix 2 PBP.

The site at present is vacant having recently been purchased by the current owner. All land located within the confines of the boundaries is suitable for asset protection zones as determined by Appendix 2 of Planning for Bushfire Protection 2006.

A summary of the asset protection zones as shown in figure 4.2 below is as follows

- Area A: 2 degrees – 33 metres to far side of road
- Area B: 5 degrees 190 metres to boundary
- Area C: Level - 32 metres to boundary
- Area D: Level – 120 metres to far side of road



FIGURE 4.7: ASSET PROTECTION ZONE PLAN



IMAGE 10: ASSET PROTECTION ZONE (AREA A) SEE FIGURE 4.7



IMAGE 11: ASSET PROTECTION ZONE (AREA B) SEE FIGURE 4.7



IMAGE 12: ASSET PROTECTION ZONE (AREA C) FIGURE 4.7 ON PREVIOUS PAGE



IMAGE 13: ASSET PROTECTION ZONE (16 METRES) (AREA D) FIGURE 4.7 ON PAGE 15 OF THIS REPORT

5.2 SERVICES

The site is provided with reticulated water. Planning for Bushfire Protection Chapter 4 deals with the provision of services. The intent of this section is to ensure there is an adequate water supply for the protection of buildings during and after the passage of a bush fire.

The table listed below determines both the Performance Requirements and Acceptable Solutions for water supply where reticulated water supply is provided. Testing of hydrant pressures is beyond the scope of this report.

A hydrant is located approximately 127 metres from the existing building on the eastern side of Castlereagh Road as shown in figure 5.3 below. See comments in conclusion.

Performance Criteria	Acceptable solutions
The intent may be achieved where:	
Reticulated water supplies <ul style="list-style-type: none"> water supplies are easily accessible and located at regular intervals 	<ul style="list-style-type: none"> reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. hydrants are not located within any road carriageway all above ground water and gas service pipes external to the building are metal, including and up to any taps. the provisions of parking on public roads are met.

FIGURE 5.2: PERFORMANCE REQUIREMENTS PLANNING FOR BUSHFIRE PROTECTION CHAPTER 4

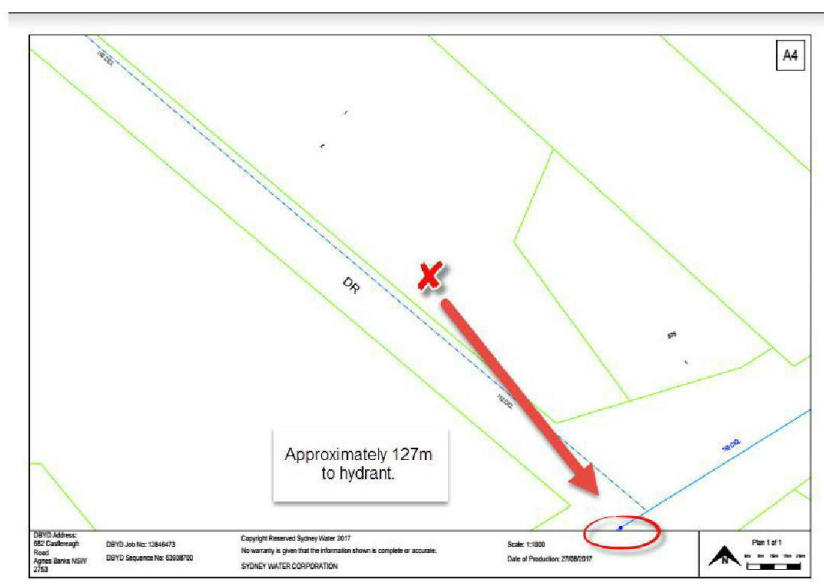


FIGURE 5.3: LOCATION OF HYDRANT FROM DEVELOPMENT

5.2 SITING AND DESIGN OF THE PROPOSED DEVELOPMENT

As with any pre-existing residential development, it is unlikely “siting” of the development can be altered to provide greater resistance to bushfire attack, however consideration can be given to construction standards to minimise the risk. See section 5.3-5.6 inclusive.

The development is well- positioned within large areas of managed land within the subject property. There is ample areas for safe egress from the property should the woodland located to the north of the development become a bushfire event.

The development is well- positioned to create and maintain both Inner and Outer Protection areas.

5.3 CONSTRUCTION LEVEL

Given the Bushfire Attack Level for the proposed development has been determined as BAL 12.5 the covered area and existing building with Sections 3 and 5 of As3959-2009.

5.4 ACCESS AND EGRESS

The proposed development lies within an existing rural/residential neighbourhood. The site provides excellent safe egress from the property via Castlereagh Road. Access within the site is by a hardstand all-weather driveway.

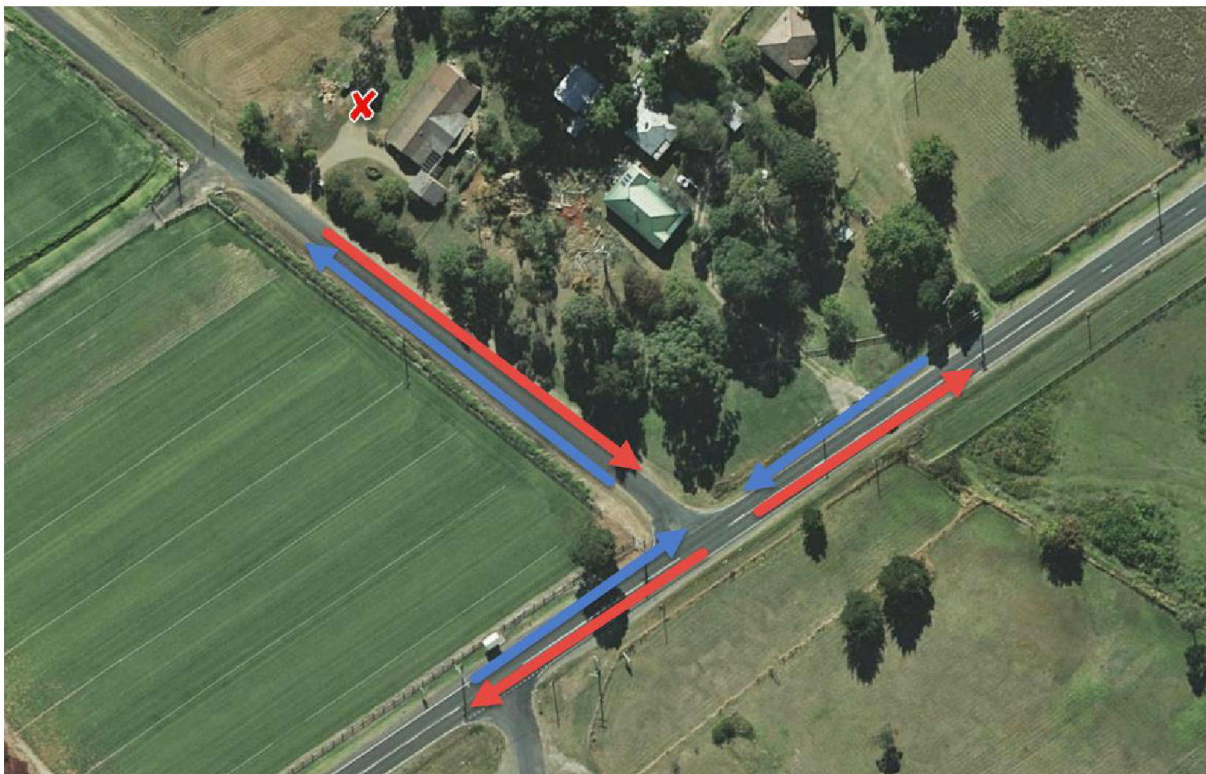


FIGURE 5.4 ACCESS AND EGRESS ROUTES

Access and egress routes are provided via public roads. The public and internal roads comply with the requirements of 4.1.3 Planning for Bushfire Protection.

The roads provided:

- Are all weather accessible
- Comply with the minimum width requirements
- Have suitable load bearing capacity
- Provide suitable height clearance
- Provide ample parking for appliances
- Are of a suitable gradient (short section of unsealed driveway is 12 degrees however, in general, the gradient complies with the performance requirements of PBP)

5.6 LANDSCAPING

In general, the landscaping complied with the performance requirements of Appendix 5 PBP. For any future planting of species the applicant should consider the recommendations made concerning landscaping in line with the principles found in A5.3 of Planning for Bushfire Protection:

- Prevent flame impingement on the dwelling
- Provide a defendable space for property protection
- Reduce fire spread
- Deflect and filter embers
- Provide shelter from radiant heat

Choice of species should consider the recommendations made in the paper "Landscape and Building Design for Bushfire Areas" by G.C Ramsay and L. Rudolph:

- Moisture content of leaves
- Volatile oil content of leaves
- Mineral Content of leaves
- Leaf fineness
- Density of foliage
- Continuity of plant form
- Height of lowest foliage above ground
- Size of plant
- Dead foliage on the plant
- Bark Texture
- Quantity of ground fuels

- Fineness of ground fuels
- Compaction ability of ground fuels

6.0 Bushfire Hazard reduction recommendations

The following recommendations are based on the requirements of AS3959-2009 and Planning for Bushfire Protection including Addendum Appendix 3.

- Ensure all leaf material is removed regularly from surrounding areas
- Future planting of unsuitable species of trees with the potential to impact on the survivability of the dwelling post-approval should be discouraged
- Keep all grassland located on the site managed to a height not exceeding 100mm
- Ensure a maintenance schedule is enacted for the maintenance of all asset protection zones located on the property. All grass to be kept to a maximum of 100mm in height.
- Provide a static water supply not less than 20,000 litres
- Provide a petrol or diesel powered pump with 19mm kink resistant hose

7.0 Conclusion

The proposed alterations and additions are located on bushfire prone land.

The building is located within well-manageable land with all surrounding land in close proximity to the building having a good history of on-going maintenance by the adjoining neighbours.

With the exception of the woodland located 28 metres from the adjoining boundary to the north, there is no assessable vegetation located within 140m.

It should be noted that Volume 1 BCA Part G5 *“Construction in Bushfire Prone Areas”* applies only to Class 2 or 3 buildings.

The development has been assessed as being exposed to a radiant heat level not exceeding 12kw/m² (BAL 12.5)

At the time of inspection, the grounds were unmanaged with a grass height exceeding 100mm. To maintain a radiant heat level not exceeding 12kw/m² it is a requirement that a plan of management be established for the site keeping all grassland to a height not exceeding 100mm.

The site has ample clear areas for safe access and egress away from the bushfire hazard. The areas available for escape are rated at less than BAL 10.

A large dam is present on site suitable for use as an additional static water supply.

The development achieves the performance criteria of PBP in the following matters:

Is a defensible space provided onsite and has the APZ been determined in accordance with Appendix 2	YES
Can the asset protection zone be maintained over the life of the development	YES
Is the building sited and designed to minimise the risk of attack	YES
Is it demonstrated the building can withstand bushfire attack in the form of embers, wind and radiant heat	YES Construction to Sections 3 and 5 of AS3959-2009
Is there safe operation access for emergency service and residents – does the access and egress comply with 4.1.3	YES
Is there adequate water supply and electrical services	YES
Is gas and electrical supply located to minimise risk to building	YES
Is landscaping designed to minimise flame and radiant heat	YES
The proposal does not increase the bushfire risk to adjoining land	YES
Does the building design and construction enhance the chances of occupant and building survival	YES
Does the development not result in an increased bushfire management and maintenance responsibility on adjoining land owners	YES

Implementation of the recommendations of this report will improve the development's ability to withstand a bushfire event however neither this report nor its recommendations guarantee in any way survival of the dwelling or its occupants.

Signed




Darryl Pendlebury

BPAD Accredited Bushfire Practitioner 36861

7.0 Appendix:

BUSHFIRE MANAGEMENT PLAN:

- The owner is to download and complete the Bushfire Survival plan from the Rural Fire Service Website – Instigate this plan every season
- Maintain a 30m 19mm kink resistant firefighting hose on a hose reel
- Keep all ground fuel to a minimum
- Keep grassland located on the site to a maximum height of 100mm
- Install a 20,000-litre water storage tank maintained as a static water supply.
- Install a 65mm storz fitting available for RFS use – metal pipework to be used

POSSIBLE ABBREVIATIONS USED

- WST – Water Storage Tank
- RFS – Rural Fire Service
- AS-Australian Standard
- BCA- Building Code of Australia