

Bushfire Hazard Assessment Report

Proposed:
**Function centre and
serviced apartments**

At:
**Lot 22 DP 791884
Pokolbin NSW**

Reference Number: 170316

Prepared For:
*Hephzibah Hunter Valley
Property PTY LTD ATF
Hephzibah Hunter Valley
Investment Unit Trust*

27th September 2017



Prepared By:
**Building Code & Bushfire
Hazard Solutions Pty Limited**

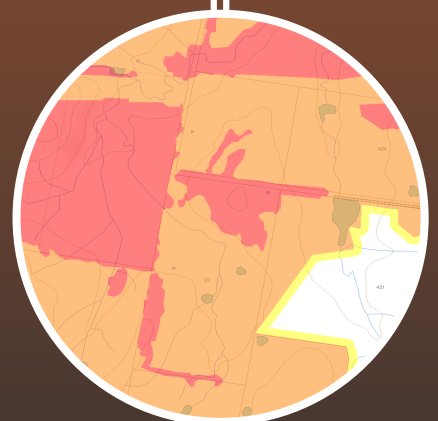
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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Cessnock City Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NP	National Park
NSW	Neighbourhood Safer Places
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2006
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to the construction of a Function Centre and 72 Serviced Tourist Accommodation Units at Lot 22 DP 791884, 226 Gillards Road, Pokolbin NSW. The subject property is located within Cessnock Council's local government area. The subject property is surrounded by Rural / Residential allotments Zoned RU4 to all aspects however an unformed road reserve known as Palmers Lane bisects the property and runs parallel along part of the western boundary, and a high voltage electrical easement is located within the northern portion of the property. The site is accessed via a right of way from Gillards Road through 340 Pokolbin Mountains Road at the southern end of the property.

The vegetation identified as being the hazard is within the subject property to the west of the proposed function centre and apartments building and grassland to the south of the site. Allowances have also been made to assume a fully structured 30 metre wide riparian corridor adjacent a 3rd order creek that traverses through the subject site, although it is understood that this corridor will not necessarily be replanted to this extent close to the development. Where the APZ marginally encroaches within this zone the riparian area no existing vegetation modification is necessary and the encroachment will be offset elsewhere onsite. No allowances have been made for any revegetation along a small 1st order tributary to this creek that is also located within the subject site.

Cessnock City Council's Bushfire Prone Land Map identifies the subject property as containing designated Category 1 Vegetation and Category 3 Vegetation and the associated 100 metre and 30 metre buffer zones from designated Category 1 Vegetation and Category 3 Vegetation and therefore the application of Planning for Bush Fire Protection - 2006 (PBP) must apply in this instance.

As the proposal relates to a new Special Fire Protection Purpose development it has been assessed under section 4.2.7 of Planning for Bush Fire Protection 2006. The site lends itself to being considered a low bushfire risk given that the surrounding area, particularly adjacent the access route, is predominantly grazed pastures and the larger forest hazards are located some distance away to the north and west of the development. Owing to the travel distance to the site from a public road the design of the APZs has been over engineered to ensure the building is located and designed to enhance the resilience of the structures when impacted by bush fire. Consequently the objectives of this report have been aimed to target the APZ requirements using the design criteria for a Neighbourhood Safer Place as an additional bushfire protection measure above the minimum requirements of PBP 2006. Therefore a FDI of 120 has been used to determine the setbacks required to achieve the 10 kW/m² radiant heat threshold and building construction to BAL 19 has been recommended. Additionally dedicated water supplies have also been considered for this application if reticulated water is not supplied to the site.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide the owners, the Rural Fire Service and Council with an independent bushfire hazard determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area. The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that the Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire hazard assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2013, the RFS document known as 'Planning for Bush Fire Protection – 2006' for the purposes of bushfire hazard determination and Australian Standard 3959 – 2009 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

A company representative has undertaken a site inspection of the subject property and the surrounding area. The plans by Morris-nunn Architects, Drawing Nos. 1604-DA1.01 – 1.04 DA 2.01 – 2.02, DA3.01 Issue Pre Dated 20th September 2017 have been referenced in the preparation of this report.

5.0 Aerial view of the subject allotment



Image 01: Aerial view of the subject area c/- NSW Government SixMaps database

6.0 Summary Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

Serviced appartments	West	Northeast / east	South
Vegetation Structure	Remnant (< 50 metre fire run towards development)	Forest**	Grassland
Hazard Slope	3 degrees down	1 degree down	0 degrees and upslope
Fuel load	8/10 t/ha surface/total	20/25 t/ha surface/total	N/A
FFDI	120*	120*	N/A
Vegetation / Fire front width	100 metres	60 metres	100 metres
Required Asset Protection Zone	41 metres	58 metres	N/A Min 10 metres with screened windows and protection of subfloor areas
Proposed Asset Protection Zone	>41 metres	>58 metres	>245 metres
Radiant Heat Exposure kW/m²	10kW/m ²	<10kW/m ²	<10kW/m ²
Threatened Species	APZ Existing	APZ Existing	APZ Existing
Aboriginal Relics	APZ Existing	APZ Existing	APZ Existing
Bushfire Attack Level (BAL)	BAL 12.5	BAL 12.5	BAL Low
Recommended construction level	BAL 19	BAL 19	BAL 19

* The minimum required Asset Protection Zone to the west was determined from bushfire design modelling consistent with Appendix 2 of PBP however the FDI has been increased from 100 to 120 to provide an additional redundancy in the design of the APZs and building.

** The extent of riparian planting is not quantified however as the creek is considered in our opinion to be a third order water course allowances have been made for a 30 metre riparian zone either side of the creek, although it is understood that this corridor will not necessarily be replanted to this extent close to the development. Where the APZ marginally encroach within this zone the riparian area no existing vegetation modification is necessary and the encroachment will be offset elsewhere onsite. No allowances have been made for any revegetation along a small 1st order tributary to this creek that is also located within the subject site.

Function Centre	West	Northeast / east	South
Vegetation Structure	Remnant (< 50 metre fire run towards development)	Forest**	Grassland
Hazard Slope	3 degrees down	1 degree down	0 degrees and upslope
Fuel load	8/10 t/ha surface/total	20/25 t/ha surface/total	N/A
FFDI	120*	120*	N/A
Vegetation / Fire front width	100 metres	60 metres	100 metres
Required Asset Protection Zone	41 metres	58 metres	N/A Min 10 metres with screened windows and protection of subfloor areas
Proposed Asset Protection Zone	>100 metres	58 metres	>80 metres
Radiant Heat Exposure kW/m²	< 10kW/m ²	10kW/m ²	<10kW/m ²
Threatened Species	APZ Existing	APZ Existing	APZ Existing
Aboriginal Relics	APZ Existing	APZ Existing	APZ Existing
Bushfire Attack Level (BAL)	BAL Low	BAL 12.5	BAL Low
Recommended construction level	BAL 19	BAL 19	BAL 19

* The minimum required Asset Protection Zone to the west was determined from bushfire design modelling consistent with Appendix 2 of PBP however the FDI has been increased from 100 to 120 to provide an additional redundancy in the design of the APZs and building.

** The extent of riparian planting is not quantified however as the creek is considered in our opinion to be a third order water course allowances have been made for a 30 metre riparian zone either side of the creek, although it is understood that this corridor will not necessarily be replanted to this extent close to the development. Where the APZ marginally encroach within this zone the riparian area no existing vegetation modification is necessary and the encroachment will be offset elsewhere onsite. No allowances have been made for any revegetation along a small 1st order tributary to this creek that is also located within the subject site.

Asset Protection Zones Compliance

The Asset Protection Zones consist of maintained land wholly within the subject site. The separation from the proposed function centre and serviced apartments building exceeds the minimum requirements under PBP 2006 for SFPP development.

Owing to the access length to the site and the proposed serviced apartments within the subject property the design of the APZs has been over engineered to ensure the buildings are located to enhance the chance for survival for humans when impacted by bush fire. Therefore a FDI of 120 has been used to determine the setbacks required to achieve the 10 kW/m² radiant heat threshold.

Construction Level Compliance

The highest Bushfire Attack Level for the proposed function centre and serviced apartments was determined from table 2.4.2 of AS3959 – 2009 and Bushfire Design Modelling consistent with Method 2 of AS3959 – 2009 (report attached) to be 'BAL 12.5'.

Owing to the remote access length to the site and the proposed serviced apartments within the subject property the construction considerations have been over engineered to ensure the building is designed to enhance the resilience of the structures when impacted by bush fire. Consequently the building construction recommended has been increased from BAL 12.5 to BAL 19.

It is therefore recommended that the function centre and serviced apartments comply with section 3 and BAL 19 section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006.

Access and Services

Guideline Ref.	Proposed Development Determinations
Property Access	The subject property has street access to Gillards Road via a ROW to the south. The upgrading of the existing access to and within the subject property will need to meet the requirements of section 4.2.7 of Planning for Bush Fire Protection 2006, with the exception to the deemed to satisfy provision being the length of any dead end access arrangements and the travel distance to a public through road.
Water Supply	There are no hydrants available within close proximity to the development site. To satisfy the water requirements detailed in section 4.2.7 of PBP either the extension or installation of a hydrant network in accordance with AS2419 – 2005 is required or a 10,000 Litre static water supply is required for each habitable building, resulting in a 50,000 Litre supply requirement for the serviced apartments and a further 10,000 Litre to be supplied in proximity to the function centre building within the subject property. Again in recognition of the travel distance to a public through road it is recommended that any water supply holding devices are plumbed so that at least 50% of these volumes is dedicated solely for fire suppression activities. This water supply will be included within the recommendations of this report.
Evacuation	A Bush Fire Evacuation Plan will be required to be prepared for the proposed development in accordance with the NSW Rural Fire Service guidelines for

emergency management plans.

7.0 Bushfire Hazard Assessment

7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bush Fire Protection - 2006' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2009 'Construction of buildings in bushfire prone areas'.

Planning for Bush Fire Protection – 2006, (PBP) formally adopted on the 1st March 2007 and amended May 2010 (Appendix 3) provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1, 2 or 3 area and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 or 3 bushfire area.

The subject development relates to the creation of a function centre and 72 serviced apartments within an existing allotment. To accord with PBP the development is classified as Special Fire Protection Purpose development and assessed as a section 100b application under the Rural Fires Act 1997.

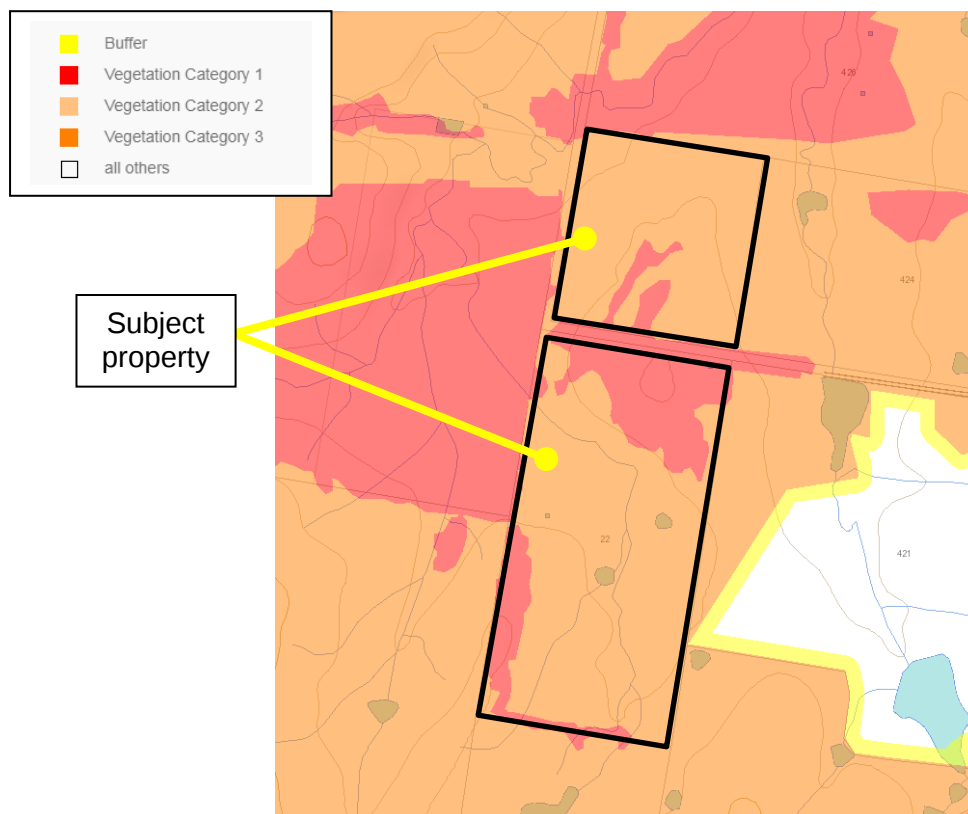


Image 02: Extract from Cessnock City Council's Bushfire Prone Land Map

7.02 Location

The subject property is located at 226 Gillards Road, Pokolbin (Lot 22 DP 791884) and is within Cessnock City Council's local government area. The subject property is surrounded by Rural / Residential allotments Zoned RU4 to all aspects however an unformed road reserve known as Palmers Lane bisects the property and runs parallel along part of the western boundary, and a high voltage electrical easement is located within the northern portion of the property. The site is accessed via a right of way from Gillards Road through 340 Pokolbin Mountains Road at the southern end of the property.

The vegetation identified as being the hazard is within the subject property to the west of the proposed function centre and serviced apartments and grassland to the south of the site. Allowances have been made to assume a riparian corridor adjacent a 3rd order creek that traverses through the subject site. No allowances have been made for any revegetation along a small 1st order tributary to this creek that is also located within the subject site.



Approx.
location of
proposed
serviced
apartments

Photograph 01: View northeast towards the proposed footprint



Entry gate to the
subject property

Photograph 02: View north from the ROW towards the subject property

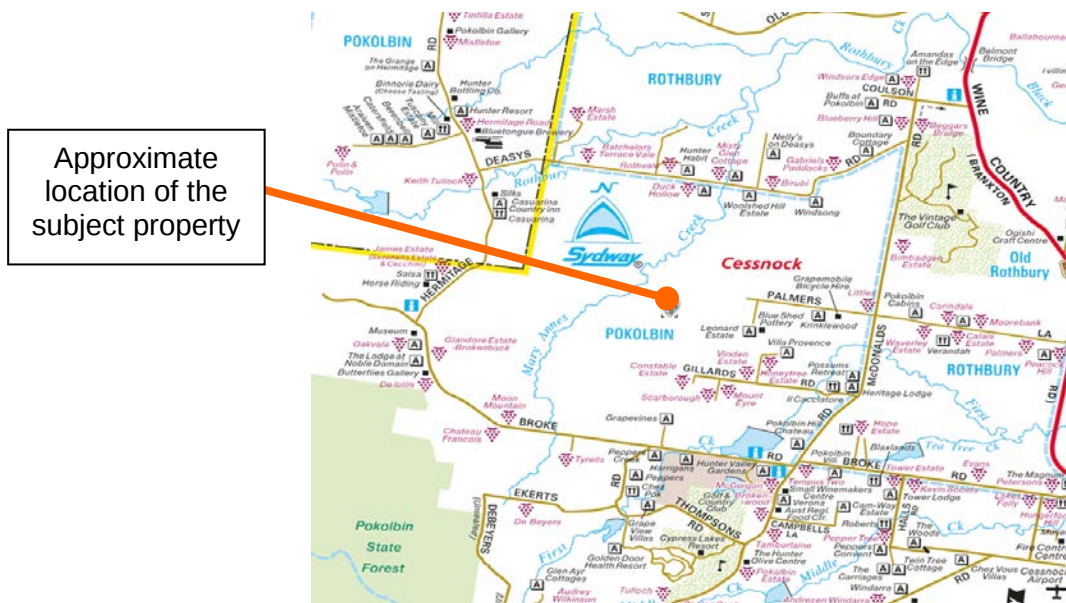


Image 03: Extract from street-directory.com.au

7.03 Vegetation

The subject property and neighbouring allotments were found to consist of maintained gardens and mown lawns around dwellings and built assets, with slashed or grazed paddocks filling in the surrounding area. The vegetation identified as being a hazard to the proposed function centre and serviced apartments is within the subject property to the west, east and south of the proposed works.

The vegetation posing a hazard to the west was found to consist of trees 10 - 20 metres in height with a space understorey of shrubs and grasses. While the vegetation to this aspect showed various attributes of a Woodland community as a conservative assessment we have determined the vegetation to the west is structurally Forest vegetation, however it provides less than 50 metre fire run towards the proposed development. PBP – 2006 states:

“Remnant Vegetation is a parcel of vegetation with a size of less than 1Ha or a shape that provides a potential fire run directly toward buildings not exceeding 50m. These remnants are considered a low hazard and APZ setbacks and building construction standards for these will be the same as for rainforests. The effective slope is to be determined over the length of the remnant.”

For the purposed of determining required APZ and construction level the vegetation to the west has been assessed using rainforest fuel loads.

To the east of the development (almost centrally within the subject site) there is a third order water course. Currently there is only sparse vegetation along this water course and the extent of riparian planting requirement is not quantified although it is understood that revegetation will be limited near the development area. Due to the proximity of the creek contingencies have been made for a 30 metre riparian zone either side of the creek and the project assessed as if this planting is undertaken and a Forest exists to this aspect. Where the APZ encroach within this assumed no existing vegetation modification is necessary and the encroachment will be offset elsewhere onsite. No allowances have been made for any revegetation along a small 1st order tributary to this creek that is also located within the subject site.

Remnant
vegetation
(Forest < 50
metre fire run)



Photograph 03: View north from within the western hazard



Creek within
subject site

Photograph 04: View east from the approximate serviced apartments footprint

7.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour within the hazard must be assessed for at least 100 metres from the proposed works. The slope was measured onsite using an inclinometer and verified from topographic imagery of the area.

The results are as follows:

- 3 degrees down slope within the hazard to the west (measured along the length of the remnant)
- 1 degree downslope within the hazard to the east
- 0 degrees and upslope within the grassland to the south

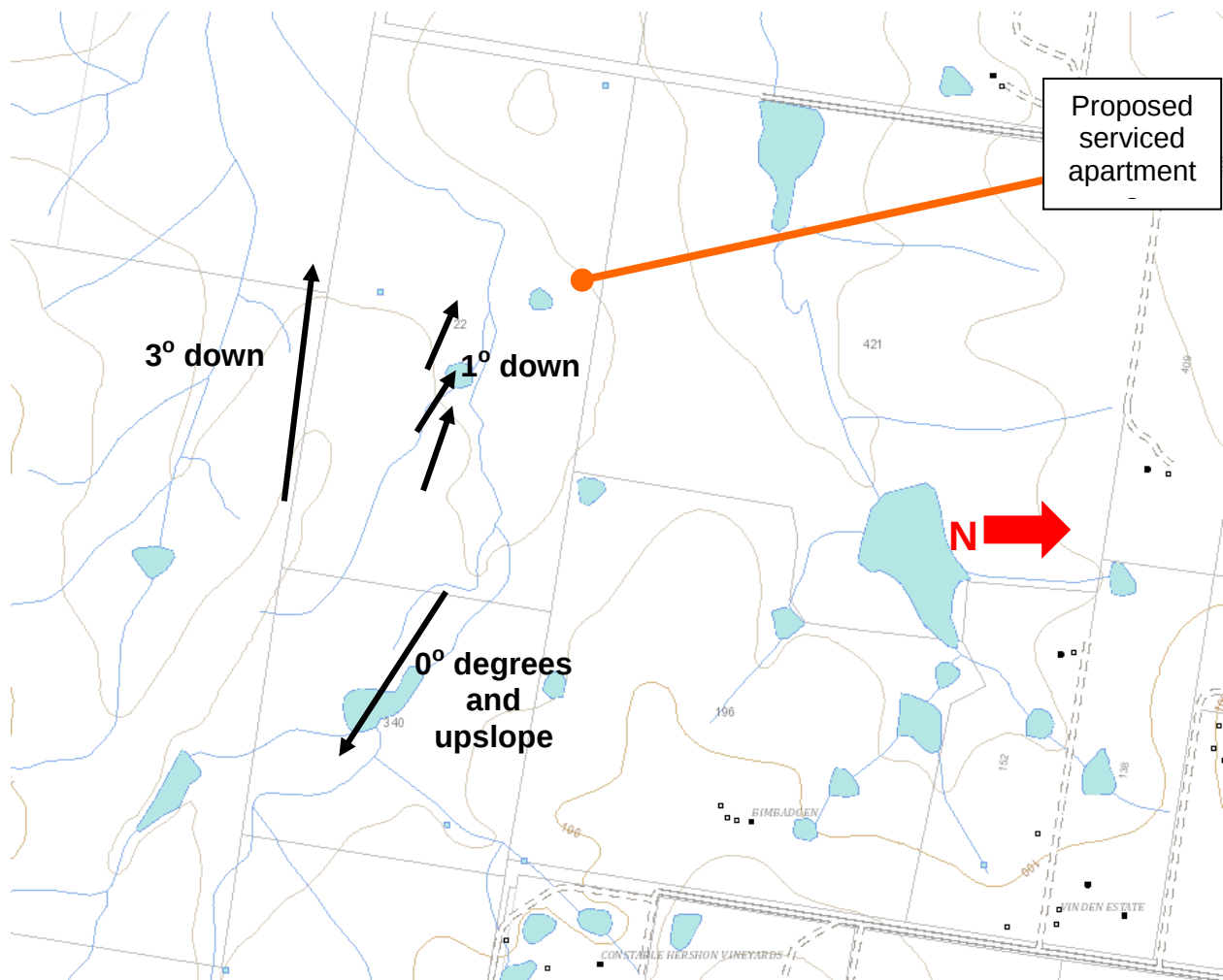


Image 04: Extract from Land and Property Management Authority Spatial Information Exchange

7.05 Asset Protection Zones

Asset Protection Zones for new Special Fire Protection Purpose (SFPP) development are determined from Table A2.6 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10 kW/m² at the closest point of the available building footprint.

Owing to the length of the access route to the site the design of the APZs has been over engineered to ensure the building is located and designed to enhance the resilience of the buildings when impacted by bush fire. Consequently the objectives of this report has been aimed to target the APZ requirements using the design criteria for a Neighbourhood Safer Place as an additional redundancy above the minimum requirements of PBP 2006.

The performance criteria for an NSP is based on a Fire Danger Index (FDI) of 120, and the acceptable solution for this is that *the building is located and designed to enhance the chance for survival for humans when impacted by bushfire. – Building is situated to prevent direct flame contact, material ignition and radiant heat levels of 10kW/m².*

The minimum required Asset Protection Zone (APZ) was determined from bushfire design modelling consistent with Appendix 2 of PBP with the exception that the FDI of 120 has been used. The minimum required APZ to the west was determined to be 41 metres and to the east was determined to be 58 metres. The design fire modelling reports are attached to the document.

The available APZ was found to be >41 metres to the west and >58 metres to the east. The Asset Protection Zones consist of maintained land wholly within the subject site. Where the APZ encroach within the riparian zone no vegetation modification in this area is required and the riparian area will be offset elsewhere onsite. While there are no minimum APZ nominated within PBP 2006 for a grassland hazard other than a comment that requires a 10 metre defensible space it is noted that all proposed development is located greater than 80 metres from any grassland hazard.

The Asset Protection Zones within the subject site shall be managed as an Inner Protection Area and will be subject to the requirements of Appendix 5 of 'Planning for Bush Fire Protection' - 2006 for the life of the development.



Photograph 05: View east from within the subject site of the existing APZ



Photograph 06: View of the maintained grounds west of the building footprints

7.06 Fire Fighting Water Supply

There are no hydrants available within close proximity to the development site.

To satisfy the water requirements detailed in section 4.2.7 of PBP either the extension or installation of a hydrant network in accordance with AS2419 – 2005 is required or a 10,000 Litre static water supply is required for each habitable building, resulting in a 50,000L supply requirement for the serviced apartments and a further 10,000L to be supplied in proximity to the function centre within the subject property. Again in recognition of the travel distance to a public through road it is recommended that if a SWS is relied upon that any water supply holding devices are plumbed so that at least 50% of these volumes are dedicated solely for suppression activities.

There are also three (3) small dams located within the subject property. As these dams are small in size the ability of these dams to provide a reliable Static Water Supply during drought conditions has not been relied upon.

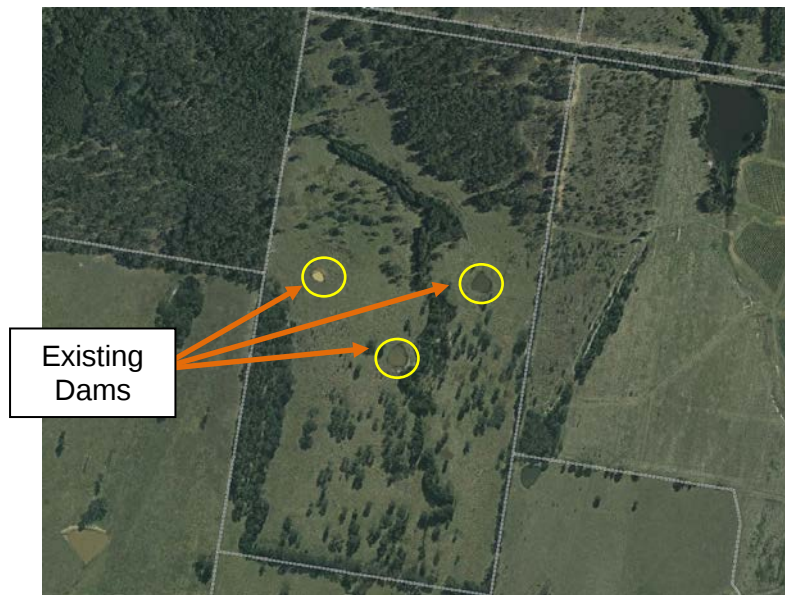


Image 05: View of the existing small Dams

7.07 Property Access

The subject property has street access to Gillards Road to the south via a ROW through a neighbouring property.

The access requirements of s4.1.3 & 4.2.7 of PBP 2006 are applicable to this development. The access drive is able to comply with the only exception to the deemed to satisfy provision being the travel distance to a public through road being greater than 200 metres.

Owing to the length of the access to the site the design of the APZs has been over engineered to ensure the buildings are located to enhance the buildings resilience when impacted by bush fire. Therefore a FDI of 120 has been used to determine the setbacks required to achieve the 10 kW/m² radiant heat threshold and the construction and building construction to BAL 19 has been recommended. Additionally dedicated water supplies have also been considered for this application if reticulated water is not supplied to the site

The recommended access provisions are considered adequate.



Photograph 07: View south along the existing access ROW to the subject site through the southern neighbouring allotment.

8.0 Site & Bushfire Hazard Determination

8.01 Planning for Bush Fire Protection – 2006

Planning for Bush Fire Protection – 2006 (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- *within or within 100m of high or medium bushfire hazards; or*
- *within or within 30m of low bushfire hazards.*

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP 2006:

8.02 Australian Standard AS 3959 – 2009 'Construction of buildings in bushfire –prone areas'

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2006 document.

8.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

8.04 Site Specific Bushfire Hazard Determination

All property development must be assessed on an individual basis as broad-brush approaches of documents such as PBP may not be applicable in every instance. The proposed development located at 226 Gillards Road, Pokolbin was assessed against the requirements of Planning for Bush Fire Protection 2006 noting the following:

- a) Water supplies for firefighting purposes will be provided as part of this application.
- b) A Bush Fire Evacuation Plan will be prepared for the proposed development and will be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.
- c) Dedicated water supply has also been considered for this application if reticulated water is not supplied to the site.
- d) Building construction is increased above the determined BAL from BAL 12.5 to BAL 19
- e) A FDI of 120 has been used to determine required APZ to achieve the 10 kW/m² threshold

8.05 Viable Construction Method

One of the objectives of Planning for Bush Fire Protection – 2006 is for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

The highest Bushfire Attack Level to the proposed function centre and serviced apartments was determined from bushfire design modelling consistent with Method 2 of AS3959 - 2009 to be 'BAL 12.5' using a FDI increased from 100 to 120.

Owing to the remote access length to the site and the proposed function centre and serviced apartments within the subject property the construction considerations have been over engineered to ensure the building is designed to increase the buildings resilience when impacted by bush fire. Consequently the building construction recommended has been increased from BAL 12.5 to BAL 19.

It is therefore recommended that the function centre and serviced apartments comply with section 3 and BAL 19 section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2006 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' - 2009. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

Asset Protection Zones

1. That all grounds within the subject site from the proposed function centre for a minimum distance of 41 metres to the south and west and for 58 metres to the north and east are to be maintained in accordance with an Inner Protection Area as detailed in Appendix 2 of Planning for Bush Fire Protection 2006 and the NSW Rural Fire Service document 'Standards for Asset Protection Zones'.
2. That all grounds within the subject site from the proposed serviced apartments for a minimum distance of 41 metres to the west and for 58 metres to the north, south and east are to be maintained in accordance with an Inner Protection Area as detailed in Appendix 2 of Planning for Bush Fire Protection 2006 and the NSW Rural Fire Service document 'Standards for Asset Protection Zones'

Construction

3. The proposed function centre and serviced apartments are required to comply with section 3 and BAL 19 section 6 under AS 3959 – 2009 and Appendix 3 under PBP 2006.

Services

6. That electricity and gas are to comply with section 4.1.3 of Planning for Bush Fire Protection 2006

Landscaping

7. That outside any riparian zones allowed for herein all new landscaping is to comply with Appendix 5 'Landscaping and Property Maintenance' under Planning for Bush Fire Protection 2006.

Emergency Management

8. That a Bush Fire Evacuation Plan be prepared for the proposed development and be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.

Water Supply

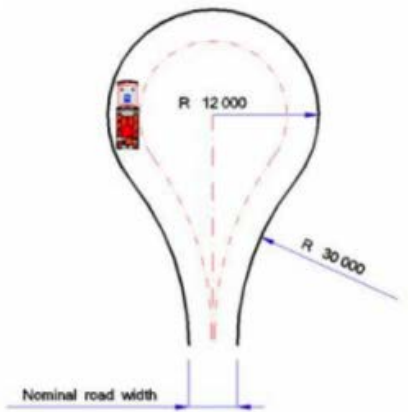
4. That where a reticulated water supply complying with AS2419 – 2005 is not provided then a 50,000L litre static water supply be provided to the serviced apartments and a 10,000L static water supply be provided to the function centre within the subject property. Where this supply is a water tank it shall be plumbed so that 50% of this volume is dedicated for fire fighting activities and comply with the following;

- ❖ A suitable connection for firefighting purposes is made available and located within the IPA and away from the structure. A 65mm Storz outlet with a gate or Ball valve is provided.
- ❖ Gate or Ball valve and pipes are adequate for water flow and are metal rather than plastic.
- ❖ 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 4 metres of the access hole.
- ❖ Above ground tanks are manufactured of concrete or metal and raised tanks have their stands protected. Plastic tanks are not used. Tanks on the hazard side of a building are provided with adequate shielding for the protection of fire fighters.
- ❖ All above ground water pipes external to the building are metal including and up to any taps. Pumps are shielded.
- ❖ That a 5hp or 3kW petrol or diesel fire fighting pumpset with suitable suction and supply hoses (inc. 38 mm storz fittings) and two (2x) 30 metre long delivery hose lines with a nozzle are maintained and available for each fire fighting static water supply.

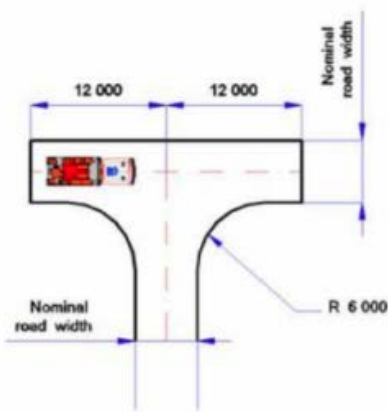
Property Access

5. That access through the ROW and within the subject site comply with the following requirements for Property Access as detailed in section 4.1.3 (1) & 4.2.7 of PBP, in particular:
- Internal roads are two-wheel drive, sealed, all-weather roads;
 - Traffic management devices are constructed to facilitate access by emergency service vehicles and suitable turning provisions are incorporated in the design.
 - A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided.
 - Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.
 - The minimum distance between inner and outer curves is six metres.
 - Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.
 - Crossfall of the pavement is not more than 10 degrees.
 - Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).
 - Roads are clearly sign-posted and bridges clearly indicate load ratings.
 - The internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

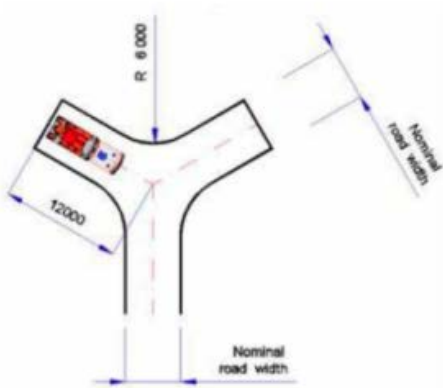
Curve radius (inside edge) (metres)	Swept Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5



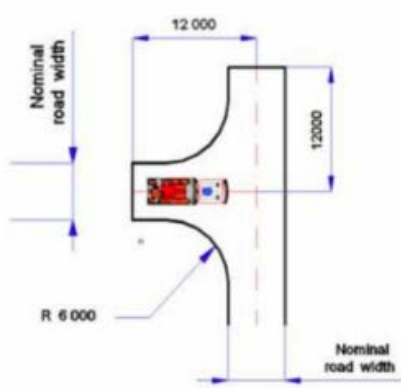
Type A



Type B



Type C



Type D

10.0 Conclusion

Given that the property is deemed bushfire prone under Cessnock City Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2006 and of the construction requirements of Australian Standard 3959 – 2009. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The development proposal relates to the construction of a function centre and 72 serviced apartments (comprising of a total of 6 buildings), located at 226 Gillards Road, Pokolbin NSW.

The vegetation identified as being the hazard is within the subject property to the west and to the east of the proposed function centre and serviced apartments and within a neighbouring property to the south of the subject site. The vegetation posing a hazard was determined to be Forest to the west, Remnant to the east and Grassland to the south.

Owing to the length of the access to the site the design of the APZs has been over engineered to ensure the building is located and designed to enhance the buildings resilience when impacted by bush fire. Consequently the objectives of this report has been aimed to target the APZ requirements using the design criteria for a Neighbourhood Safer Place as an additional bushfire protection measure above the minimum requirements of PBP 2006. Therefore a FDI of 120 has been used to determine the setbacks required to achieve the 10 kW/m² radiant heat threshold and building construction to BAL 19 has been recommended.

The minimum required Asset Protection Zone (APZ) was determined from bushfire design modelling consistent with Appendix 2 of PBP with the exception that the FDI of 120 has been used. The minimum required APZ to the west was determined to be 41 metres and to the east was determined to be 58 metres. The design fire modelling reports are attached to the document. These APZ are achievable within the subject site.

Additionally dedicated water supply has also been considered for this application if reticulated water is not supplied to the site.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development and also satisfy both the Rural Fire Service's concerns and those of Council in this area.

I am therefore in support of the development application. Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions P/L



Wayne Tucker

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FPA Australia BPAD Level 3 Accredited Practitioner
BPAD Accreditation No. BPAD9399

11.0 Annexure 01

List of Referenced Documents

- a) Environmental Planning and Assessment Act - 1979
- b) Rural Fires Act 1997 & Rural Fires Regulation 2013
- c) 'Planning for Bush Fire Protection' - 2006 - NSW Rural Fire Service & Planning NSW
- d) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2009 (as amended) – Standards Australia
- f) 'Cessnock City Council's Bushfire Prone Land Map'
- g) Proposed Site plan by; Morris-nunn Architects, Drawing No. 1604-DA1.02, Issue Pre, Dated 15th September 2017
- g) Acknowledgements to:
NSW Department of Lands – SIXMaps
Street-directory.com.au

Attachments

- Attachment 01: Bushfire Design Modelling Report.
- Attachment 02: Overlay of APZ on site plan with indicative riparian areas.





Bushfire Attack Assessment Report

AS3959 (2009) Version 1.4.2

Print Date: 15/09/2017

Assessment Date: 15/09/2017

Site Street Address: H12, Pokolbin
Assessor: Mr Admin; admin
Fire Danger Index: 120 (Fire Weather Area: Greater Hunter)
Local Government Area: Cessnock **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: East to Creek

Vegetation Information

Vegetation Type:	Forest	Vegetation Group:	Forest and Woodland
Vegetation Slope:	1 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	20	Overall Fuel Load(t/ha):	25

Site Information

Site Slope	0 Degrees	Site Slope Type:	Level
Elevation of Receiver(m)	Default	APZ/Separation(m):	58

Fire Inputs

Veg./Flame Width(m):	60	Flame Temp(K)	1200
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Calculation Parameters

Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg)	18600	Ambient Temp(K):	308
Moisture Factor:	5		

Program Outputs

Category of Attack:	LOW	Peak Elevation of Receiver(m):	10.9
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	39857
Radiant Heat(kW/m2):	10	Flame Angle (degrees):	71
Flame Length(m):	23.06	Maximum View Factor:	0.116
Rate Of Spread (km/h):	3.09	Inner Protection Area(m):	58
Transmissivity:	0.773	Outer Protection Area(m):	0

Run Description: West to the Southwester hazard			
<u>Vegetation Information</u>			
Vegetation Type:	Remnant Vegetation	Vegetation Group:	Remnant Vegetation
Vegetation Slope:	3 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	8	Overall Fuel Load(t/ha):	10
<u>Site Information</u>			
Site Slope	3 Degrees	Site Slope Type:	Upslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	41
<u>Fire Inputs</u>			
Veg./Flame Width(m):	100	Flame Temp(K)	1200
<u>Calculation Parameters</u>			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg)	18600	Ambient Temp(K):	308
Moisture Factor:	5		
<u>Program Outputs</u>			
Category of Attack:	LOW	Peak Elevation of Receiver(m):	7.24
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	7321
Radiant Heat(kW/m2):	9.99	Flame Angle (degrees):	78
Flame Length(m):	10.41	Maximum View Factor:	0.113
Rate Of Spread (km/h):	1.42	Inner Protection Area(m):	41
Transmissivity:	0.794	Outer Protection Area(m):	0