



Travers

bushfire & ecology

bushfire protection assessment

Commercial Development

Jordan Springs Tavern
Lot 3989 DP 1190132
Lakeside Parade, Jordan Springs

Under Division 4.3 (section 4.14) of the EP&A Act 1979

July 2020
(REF: 18FDC08)



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bushfire & ecology

Bushfire Protection Assessment

**Jordan Springs Tavern
Lot 3989 DP 1190132
Lakeside Parade, Jordan Springs**

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The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

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EXECUTIVE SUMMARY

A bushfire protection assessment has been undertaken for the construction of a tavern within Lot 39899 DP 119132, No. 10 Lakeside Parade, Jordan Springs.

The proposed tavern is considered a 'Class 6' structure in accordance with the National Construction Code (NCC) and is such categorised by the NSW Rural Fire Service (NSW RFS) planning policy document *Planning for Bush Fire Protection (PBP)* as being 'other' development.

The NSW RFS requires that development on bushfire prone land should satisfy the aims and objectives of *PBP*, propose a combination of bushfire protection measures and provide evidence that the intent of each measure can be satisfied.

The assessment found that bushfire can potentially affect the proposed tavern from the grassland (approved APZ) and forest located to the south of the property resulting in possible flame, ember and radiant heat attack.

This assessment has concluded that the proposed development will provide compliance with the aims and objectives of *PBP*, with the implementation of the following combination of bushfire protection measures:

- The tavern will comply with *AS3959 (2018) Construction of buildings in bushfire prone areas* – bushfire attack level (BAL) 29 refer Schedule 1 attached;
- The outdoor seating area and associated roofing will be constructed to comply with BAL 29. Fences are to be non-combustible;
- Landscaping within the site is to ensure compliance with the requirements for an asset protection zones (APZs) and provide for a defensible space for firefighting operations
- Consultation with Penrith Council is to occur to ensure the ongoing maintenance of the drainage corridor to the south of the site;
- Water and gas supply in compliance with the acceptable solutions outlined in *PBP 2019*; and
- A bushfire emergency evacuation plan is to be prepared prior to building occupation.

GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	asset protection zone
AS1596	<i>Australian Standard – The storage and handling of LP Gas</i>
AS2419	<i>Australian Standard – Fire hydrant installations</i>
AS3745	<i>Australian Standard – Planning for emergencies in facilities</i>
AS3959	<i>Australian Standard – Construction of buildings in bushfire-prone areas 2018</i>
BAL	<i>bushfire attack level</i>
BCA	<i>Building Code of Australia</i>
BSA	bushfire safety authority
DA	development application
DLUP	Development Land Use Plan
EEC	Endangered ecological community
<i>EP&A Act</i>	<i>Environmental Planning & Assessment Act 1979</i>
FFDI	forest fire danger index
IPA	inner protection area
LEP	Local Environmental Plan
LGA	local government area
m	metres
NCC	<i>National Construction Code</i>
OPA	outer protection area
<i>PBP 2019</i>	<i>Planning for Bush Fire Protection 2019</i>
<i>RF Act</i>	<i>Rural Fires Act 1997</i>
RFS	NSW Rural Fire Service
TBE	<i>Travers bushfire & ecology</i>

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Introduction

1

Travers bushfire & ecology has been commissioned to undertake a bushfire protection assessment for the proposed construction of a new tavern within Lot 3989 DP 1190132, Lakeside Parade Jordan Springs.

The proposed development is located on land mapped by *Penrith Council* as being bushfire prone (refer Figure 1.1). This triggers a formal assessment by Council in respect of the NSW Rural Fire Service (RFS) policy against the provisions of *Planning for Bush Fire Protection (PBP)*.

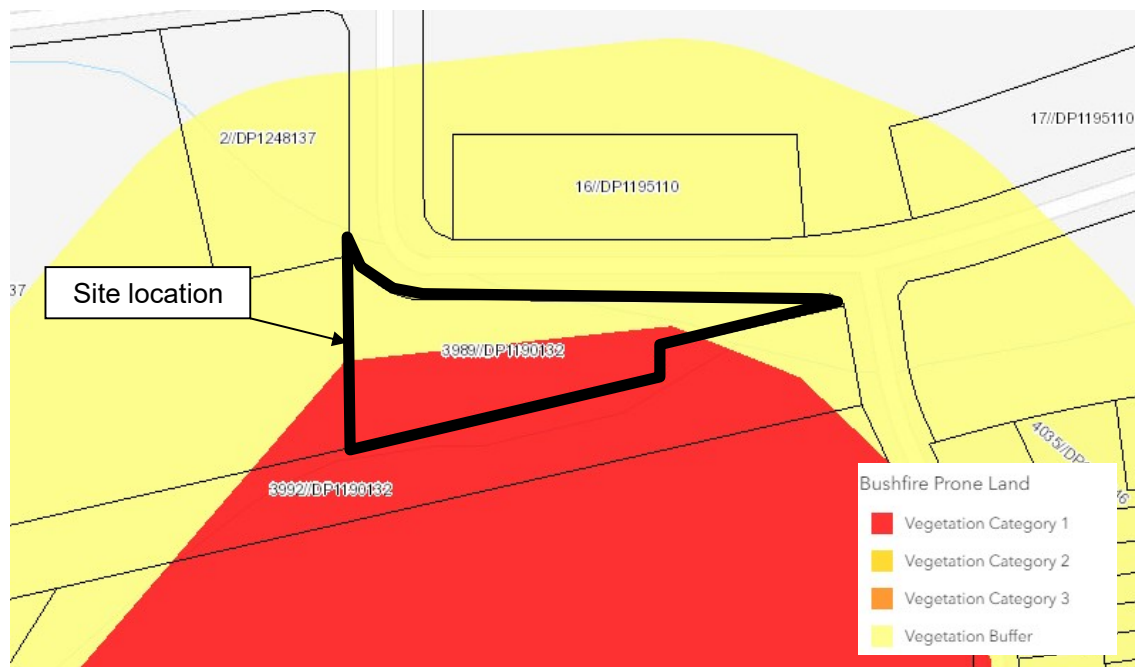


Figure 1.1 – Bushfire Prone Land Map
(source: NSW Planning Portal, 2020)

1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- review the bushfire threat to the landscape
- undertake a bushfire attack assessment in accordance with *PBP*
- provide advice on mitigation measures, including the provision of asset protection zones (APZs), construction standards and other specific fire management issues
- review the potential to carry out hazard management over the landscape.

1.2 Project synopsis

The proposal involves the construction a new tavern and associated carpark within the western portion of Lot 3989 DP 1190132, Lakeside Parade Jordan Springs (refer Figures 1.2 - 1.4).

The proposed tavern includes a main bar / dining room, TAB, kitchen, gaming rooms, outdoor seating and smoking area, beer garden and kids play area.

Access to the development will be provided via a driveway extending from Lakeside Parade Road at the north-east corner of the site to the internal car parking area.

Schedule 1 shows the proposed development and bushfire protection measures, including APZs and bushfire construction standards.

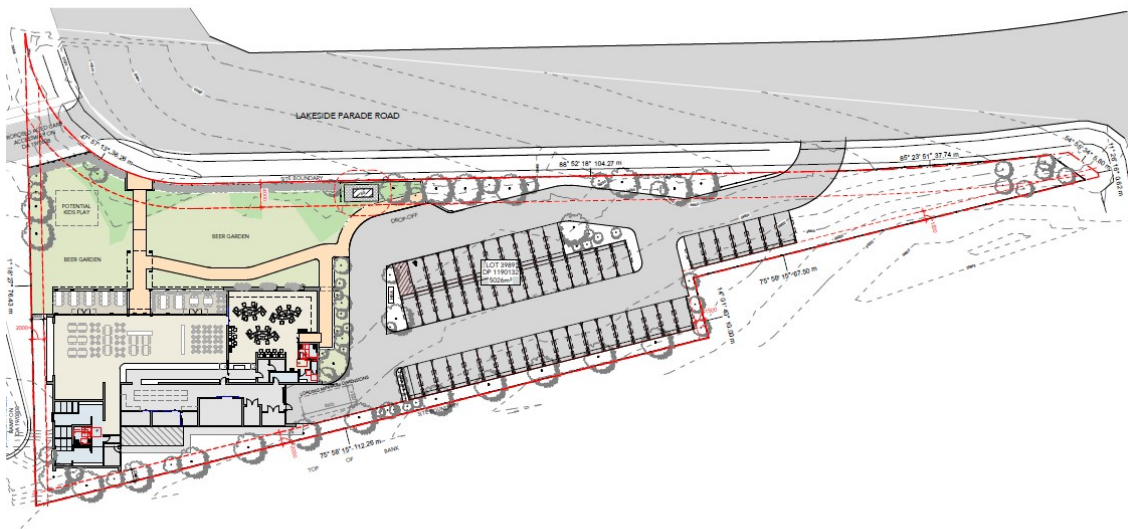


Figure 1.2 – Site Plan

(source: Team2 Architects, Project No. 930, Drawing No. SK-001, Rev. 12, dated 20.07.01)

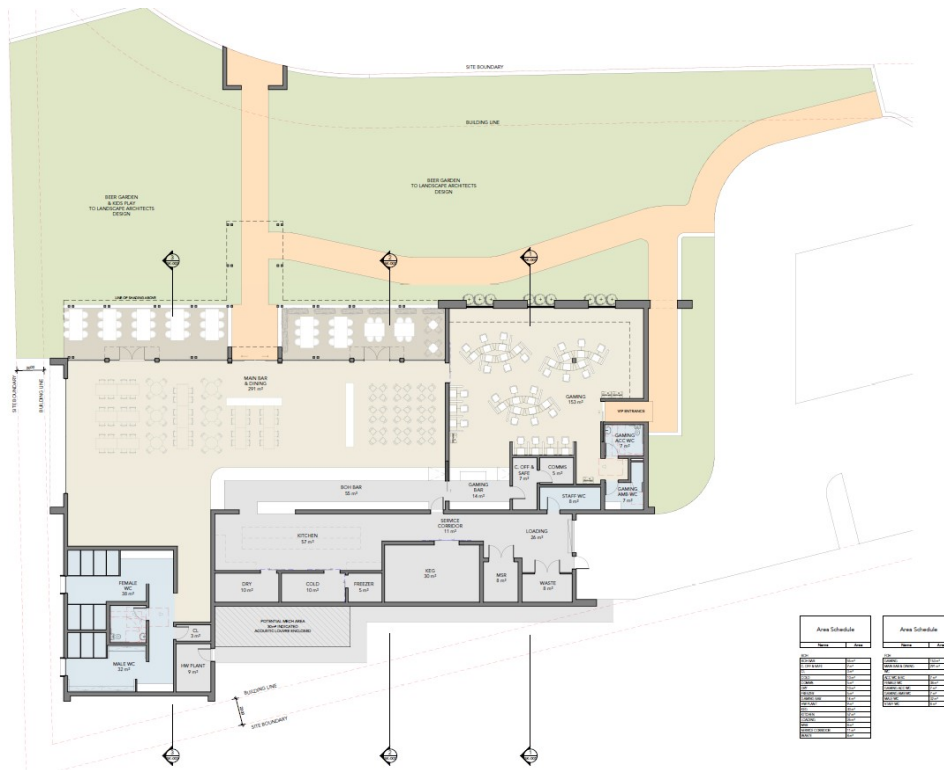


Figure 1.3– Proposed ground floor plan
 (source: Team2 Architects, Project No. 930, Drawing No. SK-002, dated 20.07.01)

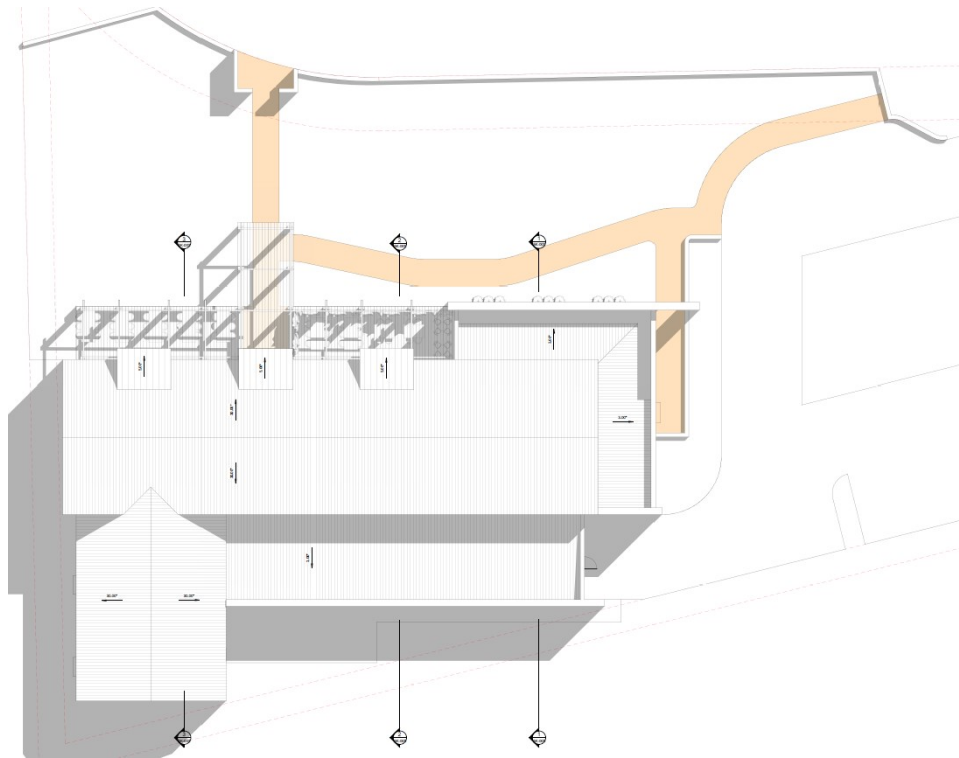


Figure 1.4– Proposed roof plan
 (source: Team2 Architects, Project No. 930, Drawing No. SK-006, dated 20.07.01)

1.3 Information collation

Information sources reviewed for the preparation of this report include the following:

- Site, ground and roof plans prepared by *Team2 Architects*, dated 20.07.01
- Wianamatta Regional Park Masterplan, prepared by Environment, Climate Change & Water, dated March 2013
- *NearMap* aerial photography
- Topographical maps DLPI of NSW 1:25,000
- *Australian Standard 3959 Construction of buildings in bushfire-prone areas (AS3959)*
- *Planning for Bush Fire Protection 2019 (PBP)*

A site inspection of the proposed development site and surrounds was undertaken by Emma Buxton to assess the topography, slopes, aspect, drainage, vegetation and adjoining land use. The identification of existing bushfire measures and a visual appraisal of bushfire hazard and risk were also undertaken.

1.4 Site description

The property is located to the south-west of Lakeside Parade and Jubilee Drive intersection, Jordan Springs within the local government area (LGA) of Penrith (refer Figure 1.5).

The site supports no existing structures and is surrounded by a mixture of managed, cleared and residential land to the north and west.

The proposal is adjoined to the immediate south by a drainage corridor serviced by Penrith Council. This corridor is accessed via a 4-metre-wide road extending from Jubilee Drive. At the time of inspection, the corridor supported a mixture of managed and unmanaged grassland. The land south of the corridor within Wianamatter Regional Park, supports forest vegetation. It is noted that previous approvals for the overall masterplan have identified the drainage corridor to the south as being maintained as an APZ (refer Section 2.1 for further detail).

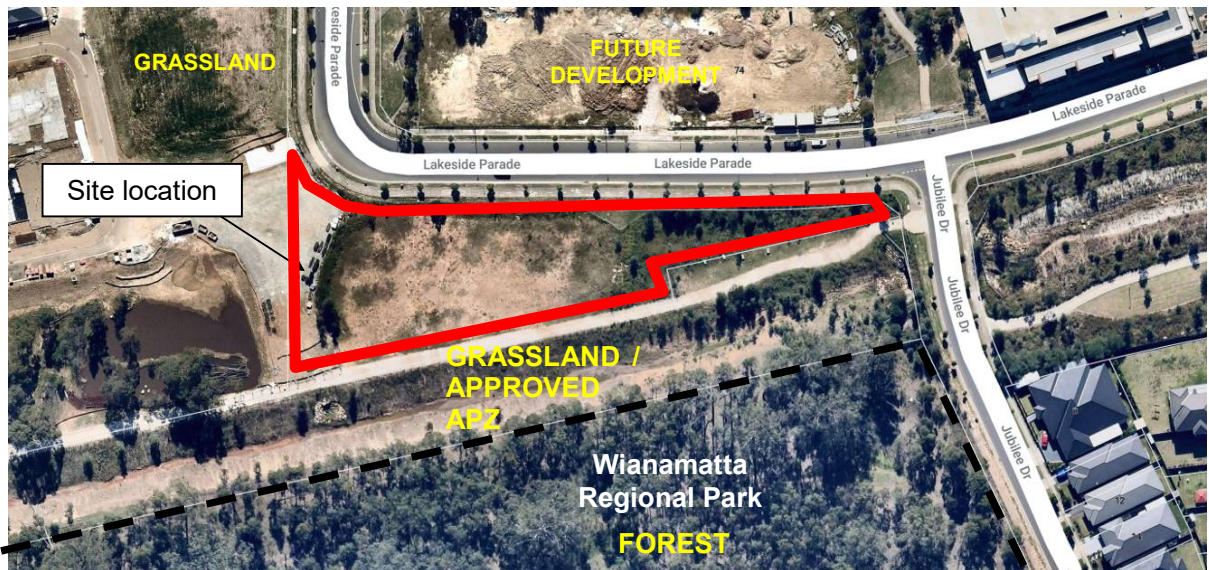


Figure 1.5 – Aerial appraisal
(source: *NearMap*, 2019)

1.5 Legislation and planning instruments

Is the site mapped as bushfire prone?	Yes
Proposed development type	Commercial development (construction of a Class 6 building – Tavern)
Does the proposal rely on an alternative solution?	Yes
Does DA need to be referred to RFS District / Team / Zone office?	Yes – as required under Division 4.3 (Section 4.14) of the <i>EP&A Act</i>
Zoning	Deferred Matter (DM)
Significant environmental features	No – the proposed development (including APZs) will not involve the removal of native vegetation.
Details of any Aboriginal heritage	No known Aboriginal sites.

1.5.1 National Construction Code (NCC) and the Australian Standard AS3959

The *NCC* is given effect through the *EP&A Act* and forms part of the regulatory environment of construction standards and building controls. The *NCC* outlines objectives, functional statements, performance requirements and deemed to satisfy provisions.

In NSW, the construction of buildings in bushfire prone areas relates to Classes 1, 2, 3, 4 and Class 9 buildings that are a special fire protection purpose (SFPP) or a Class 10a building or deck associated with the aforementioned building classes. The design and construction manual for the deemed to satisfy requirements is the Australian Standard *Construction of buildings in bushfire-prone areas 2018 (AS3959)*. These classes of buildings must therefore be constructed in accordance with *AS3959*.

The *NCC* does not provide for any bushfire specific performance requirements for commercial and industrial buildings (Classes 5-8) and, as such, *AS3959* does not apply as a set of deemed to satisfy provisions. However, compliance with *AS3959* and the NASH Standard must be considered when meeting the aims and objectives of PBP.

1.5.2 Planning for Bush Fire Protection (PBP)

PBP outlines the bushfire protection measures required to be assessed for new development in bushfire prone areas. For buildings identified of Class 5 to 8 under the *NCC* the following objectives are to be applied in relation to access, water supply and services, and emergency and evacuation planning:

- To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- Provide for the storage of hazardous materials away from the hazard wherever possible.

The general fire safety construction provisions of the *NCC* are taken as acceptable solutions however construction requirements for bush fire protection will need to be considered on a case-by-case basis.



Bushfire Threat Assessment

2

To assess the bushfire threat that is likely to occur, and thus affect the subject site, a review of the elements that comprise the overall threat needs to be completed. These elements include the potential hazardous landscape that may affect the site, the subsequent extent of the bushfire risk and the expected level of vulnerability that is likely to affect occupants and / or fire fighters.

2.1 Hazardous fuels

PBP guidelines require the identification of the predominant vegetation formation in accordance with David Keith (2004) to determine APZ distances for subdivision developments. The hazardous vegetation is calculated for a distance of at least 140m from a proposed building envelope.

The vegetation posing a bushfire hazard to the site consists of the:

- Unmanaged grassland located within the drainage corridor to the immediate south of the proposed tavern facility (refer Photo 1). This land is owned and managed by Penrith Council and is accessed by a 4m wide service road extending from Jubilee Drive to the east which runs parallel to the site's southern boundary.

A Bushfire Protection Assessment report was prepared by *Ecological Australia* in March 2014 for the broader subdivision of the Village Centre 2 (refer Figure 2.1). This report states that '*the drainage corridor has been designed to comply with an APZ through the mass planting of native grasses and sparse tree planting. The future plan of management for the riparian corridor will stipulate the management regime to keep the grasses consistent with acceptable APZ fuel loads*'.

Penrith Council is responsible for vegetation management along this corridor in accordance with a plan of management. At the time of site inspection this corridor supported a grass height in excess of the 100mm required for APZ compliance purposes. For the purpose of this assessment the existing grassland threat has been acknowledged whilst recognising that Council are responsible of the ongoing maintenance / mowing of the grassland.

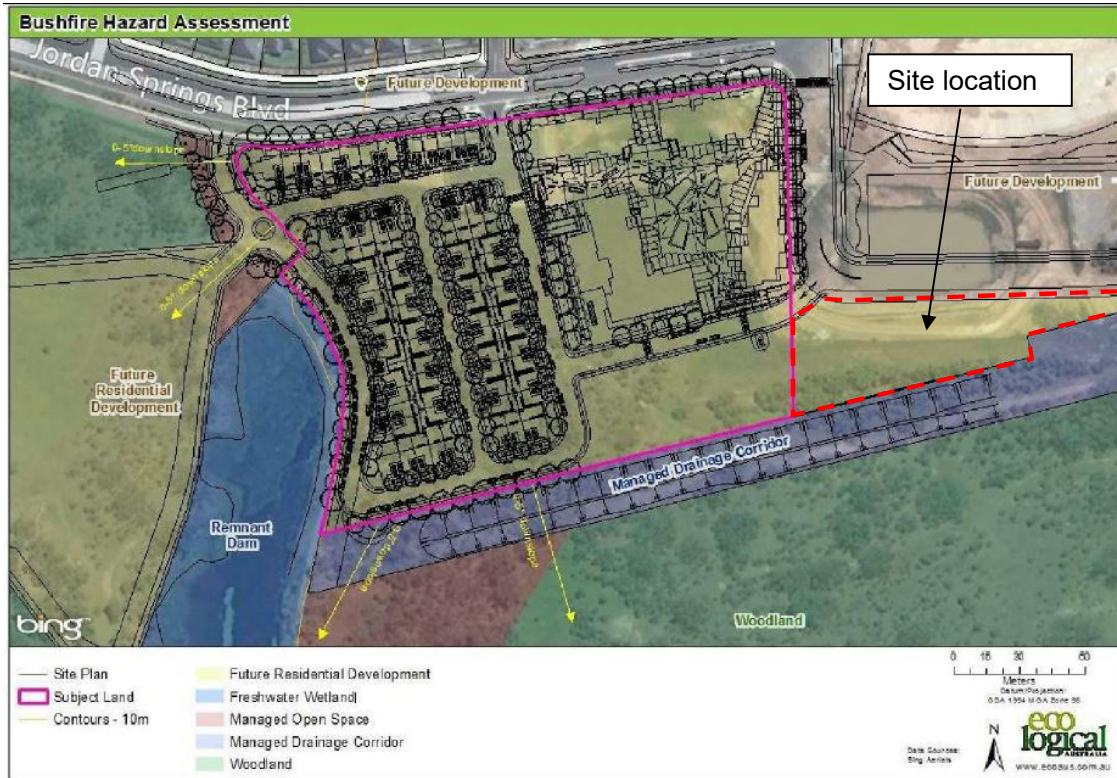


Figure 2.1 – Managed drainage corridor to the south
 (source: Ecological Australia, 2014)



Photo 1 – Grassland associated with Council easement (including access road)

- Forest located beyond the drainage corridor to the south of the site (refer Photo 2). This vegetation is listed as protected in accordance with the Wianamatta Regional Park Masterplan;



Photo 2 – Forest located within Wianamatta Regional Park

- Grassland / freshwater wetland vegetation associated with the stormwater easement over 31m to the west and;
- Unmanaged grassland to the north-west (refer Photo 3).



Photo 3– Unmanaged grassland to the north-west (future development)

The remaining land, within 100m of the site, is not considered a bushfire threat as it consists of a mixture of cleared / managed land.

2.2 Effective slope

The effective slope is assessed for a distance of up to 100m. Effective slope refers to that slope which provides the most effect upon likely fire behaviour. A mean average slope may not in all cases provide sufficient information such that an appropriate assessment can be determined.

The effective slope within the hazardous vegetation is outlined within Table 2.1.

2.3 Bushfire attack assessment

A fire danger index (FDI) of 100 has been used to calculate bushfire behaviour on the site based on its location within the Greater Sydney region. Table 2.1 provides a summary of the bushfire attack assessment.

Note: There are no predetermined minimum APZ requirements for commercial development under *PBP*. The distances provided in Column 5 (of Table 2.1) will provide appropriate defensible space for the proposed tavern facility. The defensible space is designed to allow fire fighters room and safety to fight fires.

Table 2.1 – Bushfire attack assessment

Aspect	Vegetation formation within 140m of development	Effective slope in hazard vegetation	Minimum APZ recommended to avoid flame contact	APZ provided	BAL level recommended (Refer Section 3.2)
South	Grassland	0-5 ^{0D}	9m	5m (including 4m wide Council service road) (refer Note 1)	BAL 29
	Forest	Level	24m	26m	
North-west	Grassland	Level	8m	39m	
West	Grassland / Freshwater wetland	0-5 ^{0D}	5m	31m	
North & east	Managed / cleared	N/A	N/A	>100m	

Note 1- The APZ extends outside of development site within adjoining Lot 1037 DP 1149525 (south) to include the existing 4m wide service road. This corridor is owned by Penrith Council and is managed as a drainage corridor. During the time of inspection this corridor was 'unmanaged' however Penrith Council are responsible for maintenance / mowing of this land. Consultation with Penrith Council is to occur to ensure the ongoing maintenance / mowing of this land.



Specific Protection Issues

3

3.1 Asset protection zones (APZs)

APZs are areas of defensible space separating hazardous vegetation from buildings.

The APZs provided for the commercial development comply with the following aims and objectives of *PBP*. These include:

1. Afford occupants of any building adequate protection from exposure to a bushfire.
2. Provide for a defensible space to be located around buildings.
3. Provide appropriate separation between a hazard and buildings which, in combination with other measures to prevent material ignition.
4. Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ.

In accordance with *PBP*, appropriate defensible space, coupled with the provision of access and building construction requirements has been provided to comply with the aims and objectives listed above.

3.2 Building protection

The *NCC* does not provide any bushfire specific requirements for Classes 5-8 industrial / buildings. The general fire safety construction provisions are taken as acceptable solutions.

PBP recommends that bushfire construction standards for Classes 5-8 buildings should be considered on a case by case basis. Bushfire construction recommendations are dependent on the level of bushfire risk and the provision of adequate access opportunities.

The bushfire attack assessment (as calculated within Section 2.3 of this report) shows the building may be exposed to flame contact if the grassland to the south is not maintained on consistent basis. As a result it is recommended that the applicant contact Council to resume maintenance of the corridor.

The building and outdoor seating area is to comply with BAL 29 as outlined in *AS3959 Construction of buildings in bushfire prone areas (2009)* or *NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas - 2014* as appropriate, with additional construction requirements as listed within *PBP*.

3.3 Hazard management

APZs are required to be managed as an inner protection area (IPA) in accordance with the NSW RFS guidelines *Standards for Asset Protection Zones (RFS, 2005)*, with landscaping design to comply with Appendix 4 of *PBP*. Appendix 2 provides maintenance advice for vegetation within the APZ.

3.4 Access for fire-fighting operations

Access to the development will be provided via a 5.5m wide driveway extending from Lakeside Parade in the north-east. This driveway forms an internal road network and provides car parking for up to seventy (70) vehicles together with a vehicle drop-off bay and truck loading area adjacent to the tavern.

The proposed access complies with the aims and objectives of *PBP*.

3.5 Water supplies

The fire hydrant system is to comply with the following requirements;

- fire hydrant spacing, sizing and pressures comply with *AS2419.1 (2005)*.
- hydrants are not placed within any road carriageway.
- all above ground water and gas pipes external to the building are metal, including and up to taps.

The proposal must comply with the above requirements.

3.6 Gas supplies

Gas services are to comply with the following requirements:

- 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.

The proposal must comply with the above requirements.

3.7 Emergency and evacuation planning

Table 3.6 outlines the required performance criteria for the proposal's emergency procedures

Table 3.1 – Performance criteria for emergency and evacuation planning

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
A bush fire emergency and evacuation management plan is prepared.	<p>A bush fire emergency management and evacuation plan is prepared consistent with the:</p> <ul style="list-style-type: none"> • The NSW RFS document: <i>A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan</i> 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	An evacuation plan will be prepared
Note: A copy of the Bush Fire Emergency Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.				

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
<p>Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan.</p>	<p>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.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Will be a condition of consent</p>
	<p>Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.</p>			



Conclusion & Recommendations

4

4.1 Conclusion

A bushfire protection assessment has been undertaken for the construction of a tavern within Lot 39899 DP 119132, No. 10 Lakeside Parade, Jordan Springs.

The assessment found that bushfire can potentially affect the proposed tavern from the grassland and forest vegetation located to the south of the development resulting in possible flame, ember and radiant heat attack.

This assessment has concluded that the proposed development will provide compliance with the aims and objectives of *PBP*, with the implementation of the following combination of bushfire protection measures:

- The tavern will comply with *AS3959 (2018) Construction of buildings in bushfire prone areas* – bushfire attack level (BAL) 29 refer Schedule 1 attached;
- The outdoor seating area and associated roofing will be constructed to comply with BAL 29. Fencing is to be non-combustible;
- Landscaping within the site is to ensure compliance with the requirements for an asset protection zones (APZs) and provide for a defendable space for firefighting operations
- Consultation with Penrith Council is to occur to ensure the ongoing maintenance of the drainage corridor to the south of the site;
- Water and gas supply in compliance with the acceptable solutions outlined in *PBP 2019*; and
- A bushfire emergency evacuation plan is to be prepared prior to building occupation.

The following recommendations are provided to ensure that the development is in accord with or greater than the requirements of *PBP*.

4.2 Recommendations

Recommendation 1 - The development is as generally indicated on the attached Schedule 1 – Plan of Bushfire Protection Measures.

Recommendation 2 - The entire property (landscaping) is to be managed as an inner protection area (IPA) as outlined within Section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006* and the NSW RFS document *Standards for asset protection zones*.

Recommendation 3 - Consultation with Penrith Council is to occur to ensure the ongoing maintenance of the drainage corridor to the south of the site in accordance with a Plan of Management.

Recommendation 4 - Building construction standards are to be applied in accordance with BAL 29 (Tavern and outdoor seating area) as outlined in *AS3959 Construction of buildings in bushfire prone areas (2009)* or *NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas - 2014* as appropriate, with additional construction requirements as listed within *PBP*.

Recommendation 5 - Fencing is to be non-combustible.

Recommendation 6 - Water, electricity and gas supply is to comply with Section 5.3.3 of *Planning for Bush Fire Protection 2019*.

Recommendation 7 - A Bushfire Emergency Management and Evacuation Plan is to be prepared to comply with Section 6.8.4 of *PBP*.

REFERENCES

- Australian Building Codes Board (2010) – *Building Code of Australia, Class 1 and Class 10 Buildings Housing Provisions Volume 2*
- Chan, K.W. (2001) – *The suitability of the use of various treated timbers for building constructions in bushfire prone areas*. Warrington Fire Research
- Councils of Standards Australia AS3959 (2009) – *Australian Standard Construction of buildings in bush fire-prone areas*
- Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change
- Rural Fire Service (2006) - *Planning for bushfire protection – a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service
- Rural Fire Service (2006) - Bushfire Attack Software on RFS web site
- Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack*. RFS Development Control Service



Bushfire Protection Measures

S1



DISCLAIMER: CAD not georeferenced and has been aligned to LPI boundaries. Verification by a registered surveyor required prior to finalisation.

Legend

Site boundary (source:LPI)	Asset Protection Zone (APZ)	Bushfire Construction Standards
Edge of vegetation	Proposed Infrastructure	AS3959 (2018)
Existing hydrant	Tavern	BAL 29
	Outdoor Seating	
	Play area	

Aerial source: Nearmap

* Please refer to additional construction requirements for BAL levels which are contained in section 7.5 of 'Planning for Bushfire Protection' (2019).

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

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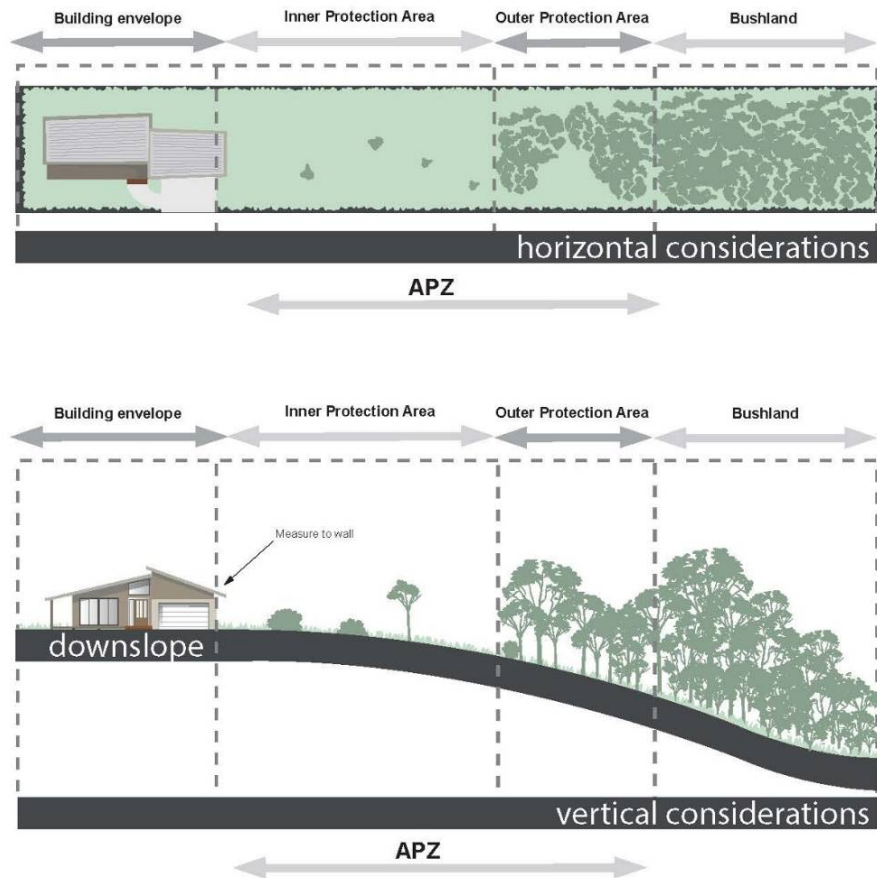


Management of Asset Protection Zones

A1

The RFS provides basic advice in respect of managing APZs through documents such as, *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 5 of *PBP*.

The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. The property is to be managed to IPA standards only. A typical APZ is graphically represented below:



APZs and progressive reduction in fuel loads (Source: PBP, 2019)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought regarding vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the RFS performance criteria.

The following provides maintenance advice for vegetation within the IPA. The APZ is to be maintained in perpetuity and should be undertaken regularly, particularly in advance of the bushfire season.

Inner protection area (IPA)

Fuel loads within the IPA are to be maintained so it does not exceed 4t/ha.

Trees are to be maintained to ensure;

- canopy cover does not exceed 15% at maturity;
- trees (at maturity) do not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs are to be maintained to ensure;

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

Grass is to be maintained to ensure:

- 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 (litter fuel within the IPA should be kept below 1cm)

General advice for landscaping is provided below:

- Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
- Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come into contact with the building;
- When considering landscape species consideration needs to be given to estimated size of the plant at maturity;
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;
- Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
- Avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter);
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and
- Use of low flammability vegetation species.