

Bushfire Assessment

Planning Proposal

Wilton Park Road & Berwick Park Road, Wilton

Altis Property Partners

11 May 2023

(Ref: 22064)

report by david peterson

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Executive summary

Objective

This Bushfire Assessment Report was commissioned by Altis Property Partners to inform a Planning Proposal application seeking approval to rezone land at Wilton to allow future warehouse development. The objective was to assess the bushfire hazard and recommend bushfire protection measures to achieve compliance with the relevant specifications and requirements for protection against bushfires.

Compliance with legislation and policy

A Planning Proposal on bushfire prone land must have regard to Section 9.1(2) Direction 4.3 – 'Planning for Bush Fire Protection' of the *Environmental Planning and Assessment Act* 1979 as well as the NSW Rural Fire Service document 'Planning for Bush Fire Protection 2019'.

Bushfire hazard

The primary bushfire hazard consists of extensive forested areas to the south and west of the subject land associated with the Nepean River. Secondary hazards consist of grassland within surrounding grazing lands and a low hazard riparian corridor within the development site.

Measures to achieve compliance

Bushfire protection measures recommended within this report to achieve the requirements are listed below:

- Provision of APZ building setbacks to the dimension of BAL-FZ to all identified bushfire hazards as shown on Figure 4.
- Application of ember protection construction measures to future buildings as listed in Section 4.2.2.
- Vegetation and landscaping across APZs and the development site is to be maintained to achieve the standard of Inner Protection Area (IPA).
- Public road design is to comply with Table 5.3b of 'Planning for Bush Fire Protection 2019'. Alternate access is to be provided to the external road system to the north.
- A perimeter road (8 m) wide is to be provided to the southern and western sides of the development site where interfacing the hazard. Regular links to the internal public road are required.
- Hydrants are to be installed along the public road network and perimeter roads in accordance with AS 2419.1:2005 Fire hydrant installations: System design, installation and commissioning.

Conclusion

The report concludes that the Planning Proposal together with the recommended bushfire protection measures satisfies the specifications and requirements of Ministerial Direction No. 4.3 and *Planning for Bush Fire Protection*.



1 Introduction

Street or property name:	25, 45, 55, 75, 85 & 95 Wilton Park Road and 10, 20 & 30	
	Berwick Park Road	
Suburb, town or locality:	Wilton	Postcode: 2571
Lot/DP no:	Lots 3, 5, 6 & 7 DP 233845, Lot 4	40 & 41 DP 749823, Lots 1
	& 2 DP 609222 and Lot 16 DP 25	1051
Local Government Area:	Wollondilly Shire Council	
Type of proposal:	Rezoning for general industrial de	evelopment

1.1 Background

Altis Property Partners commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to inform the preparation of a Planning Proposal for the above site which is identified as containing 'bushfire prone land'. This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation and policy.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and description of subject land

The subject land is situated in the Wilton Growth Area in south-west Sydney. Comprised of nine lots, the subject land is approximately 107 hectares in size and is located at the junction of the Hume Motorway and Picton Road as shown on Figure 1.

Each lot contains a dwelling and various outbuildings amongst generally cleared and managed surroundings. Forest vegetation remains along the southern portion of the subject land on steep lands associated with the Nepean River corridor. These forested areas act as the bushfire hazard affecting the subject land and future development proposals. A detailed description of the bushfire hazard is provided in Section 3.

1.3 Description of development proposal

This Bushfire Assessment Report has been prepared to inform and support a Planning Proposal that seeks to rezone the subject land from RU2 – Rural Landscape to E4 – General Industrial. As shown on the masterplan at Figure 2, the northern portion of the subject land certified as urban capable would be subject to warehouse developments. The southern portion of the subject land is non-certified, and development is to be avoided in accordance with the Cumberland Plain Conservation Plan. The southern portion of the subject land also includes a koala habitat corridor.





Legend



Figure 1: The Location of the Subject Land



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Figure 2: The Proposal

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2 Assessment requirements

Planning Proposal submissions involving bush fire prone land (refer to Figure 3) must have regard to Section 9.1(2) Direction 4.3 – 'Planning for Bush Fire Protection' of the *Environmental Planning and Assessment Act 1979* as well as the NSW Rural Fire Service document 'Planning for Bush Fire Protection 2019' (referred to as 'PBP' throughout this report).

2.1 Direction 4.3 requirements

When investigating the capability of bushfire prone land to be rezoned, submissions must have regard to Section 9.2 Direction 4.3 – 'Planning for Bush Fire Protection' of the *Environmental Planning and Assessment Act 1979*. The objectives of Direction 4.3 are:

- To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas; and
- To encourage sound management of bushfire prone areas.

Direction 4.3 instructs councils on the bushfire matters which need to be addressed when drafting and amending Local Environmental Plans (LEP). They are as follows:

- In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of clause 4, Schedule 1 to the EP&A Act, and take into account any comments made.
- A planning proposal must:
 - have regard to the document Planning for Bush Fire Protection 2019;
 - introduce controls that avoid placing inappropriate developments in hazardous areas; and
 - ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ).
- A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:
 - o provide an Asset Protection Zone (APZ) incorporating at a minimum:
 - an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and,



- an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road.
- for infill development (that is development within an already subdivided area), 0 where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,
- contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,
- contain provisions for adequate water supply for fire-fighting purposes, 0
- minimise the perimeter of the area of land interfacing the hazard which may be developed,
- introduce controls on the placement of combustible materials in the Inner \cap Protection Area.

2.2 Planning for Bush Fire Protection 2019 (PBP) requirements

Most of the Direction 4.3 provisions are specified within PBP. This report addresses both Direction 4.3 and PBP, combining responses to requirements where there is overlap between the requirements.

PBP also specifies the type of bushfire assessment and level of information and detail required for Planning Proposal submissions. PBP Section 4 'Strategic Planning' outlines the submission requirements. The Planning Proposal is to be assessed in accordance with PBP Section 4.4.1 whereby the nature, scale and risk of the proposal and its potential impact on the wider infrastructure network is such that a Strategic Bush Fire Study (SBFS) is not required in accordance with PBP Section 4.2. A SBFS is required for strategic development proposals whereby new areas are to be developed for residential of SFPP development. The Planning Proposal does not seek to introduce these uses.

2.2.1 PBP assessment objectives for development other than residential and SFPP

Section 8.3 of 'Planning for Bush Fire Protection 2019' (PBP) prescribes the assessment methodology and bushfire protection measures for uses other than those that involve a habitable dwelling (Class 1, 2 or 3) or Special Fire Protection Purpose (SFPP) development. In order to comply with PBP, the following conditions must be met:

satisfy the aim and objectives of PBP outlined in Chapter 1;

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- consider any issues listed for the specific purpose for the development set out in this • chapter; and
- propose an appropriate combination of bushfire protection measures.



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It is also important to ensure that a 'defendable space' is provided for the size and scale of the development.

The aim and objectives of PBP are listed below:

- 1. The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.
- 2. The objectives are to:
 - a) afford buildings and their occupants protection from exposure to a bush fire;
 - b) provide for a defendable space to be located around buildings;
 - c) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
 - d) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
 - e) provide for ongoing management and maintenance of BPMs; and
 - f) ensure that utility services are adequate to meet the needs of firefighters.

Section 8.3.1 of PBP lists the issues specific to warehouse developments in light industrial zoning. As stated in PBP, the NCC does not provide for any bushfire specific performance requirements for these types of uses. As such the Asset Protection Zones (APZ) and Bushfire Attack Levels (BAL) do not apply as deemed-to-satisfy provisions for bushfire protection. The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bushfire protection (i.e. BALs) are to be considered on a case-by-case basis in order to satisfy the aim and objectives of PBP.

The specific issues to be assessed for warehouses developments are in relation to access, water supply and services, and emergency and evacuation planning as follows:

- 1. Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- 2. Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- 3. 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
- 4. Provide for the storage of hazardous materials away from the hazard wherever possible.







Figure 3: Bushfire Prone Land

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3 Bushfire hazard

An assessment of the hazard surrounding and within the subject land is necessary to determine the suitability of the proposed future land use as well as the required bushfire protection measures, such as Asset Protection Zones (APZ), that may be required between future development and bushfire hazards. The bushfire hazard is a combination of vegetation and slope determined in accordance with methodology specified by PBP.

3.1 Predominant vegetation

The vegetation within 140 m of the urban capable land has been assessed in accordance with the methodology specified by PBP. These hazards are mapped on Figure 4 and described below.

• Forest to the south and west

The primary hazard affecting the urban capable land is the forest generally south and west. The forest is mapped as 'Sydney Hinterland Dry Sclerophyll Forest' (SVTM_NSW_Extant_PCT) and is contiguous with extensive forested areas to the south and west.

• Low hazard

A narrow riparian corridor will be maintained at the north-western corner of the urban capable land. Corridors of vegetation less than 50 m wide may be classified as 'low hazard' vegetation in accordance with Section A1.11.1 of PBP.

• Grassland to the north

Rural properties to the north of Wilton Park Road and Berick Park Road have the potential to present a grassland hazard depending on the management regime (e.g. grazing rates), grass growth and curing. As such, the paddocks are to be classified as a 'grassland' hazard.

The Hume Motorway shares the eastern boundary of the subject land and provides a substantial buffer to the grasslands further to the east.

3.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the hazard occurs within 100 m of the urban capable area. The slope was determined using a 2 m contour layer as shown on Figure 4. The slope classes are indicated on Figure 4.

The slope influencing fire behaviour within adjoining hazards range between the PBP slope class of 'downslope 0-5 degrees', 'downslope 5-10 degrees' and 'downslope 10-15 degrees'.





Legend



Non certified -Avoided for Waterbody Conservation Plan

Biodiversity - Draft Cumberland Plain

BAL Flame Zone -40kW/m² APZ



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Figure 4: Bushfire Hazard Analysis and Asset Protection Zone

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Addressing compliance

This section details how compliance with the assessment requirements listed in Section 2 are addressed. The response to requirements is set out following the structure of Direction 4.3, followed by PBP. There is duplication of requirements between Direction 4.3 and PBP; in these cases, the relevant report subsection is referred to for the appropriate response.

4.1 Direction 4.3

The objectives of Direction 4.3 can only be satisfied once the provisions are achieved. Demonstration of achieving the provisions is provided below (Section 4.1.2). Statements of how the objectives are achieved are as follows:

4.1.1 Objectives

Objective 1

<u>"To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas"</u>

The intention of the objective is to avoid a development outcome that is faced by or poses a risk that cannot be managed to an acceptable level (i.e. compliant with PBP). The assessment of 'incompatible', 'inappropriate' and 'acceptable' is a subjective one, and one that is not defined within PBP, legislation or related policy. To guide an assessment, reference should be made to the measures specified by PBP (see Section 4.2), such as the ability to establish and maintain adequate APZs, and the assurance of acceptable access and evacuation.

This Bushfire Assessment Report demonstrates that the risk can be managed to an acceptable level by implementing the recommendations therefore making it compatible with the surrounding environment. Compliant APZs coupled with adequate access designed to address the bushfire risk produces a landuse that is not considered incompatible with the surrounding bushfire prone area. It is important to note that the proposed use is general industrial and will be an employment area. More vulnerable uses such as residential development or Special Fire Protection Purpose (SFPP) development are not proposed.

Objective 2

"To encourage sound management of bushfire prone areas"

The recommended bushfire protection measures demonstrate sound management of the subject land for the intended use. The provisions and how they are to be addressed are listed in Section 4.1.2.



4.1.2 Provisions

Provision 1

"have regard to Planning for Bush Fire Protection 2019"

Addressing this provision is detailed in Section 4.2. The Planning Proposal complies with PBP.

Provision 2

"introduce controls that avoid placing inappropriate developments in hazardous areas"

The proposal is not considered inappropriate for the level of bushfire hazard in the area. Controls (bushfire protection measures) will be set in place to ensure compliance with PBP. The controls are set out in Section 4.2.

Provision 3

"ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ)"

Proposed APZs will be contained wholly within perimeter roads and urban capable land (i.e. the development site). These areas will be routinely managed. APZs will not be placed within the non-certified land or the koala habitat corridor.

Provision 4

"provide an Asset Protection Zone (APZ) incorporating at a minimum:

- <u>an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the</u> <u>hazard side of the land intended for development and has a building line consistent with</u> <u>the incorporation of an APZ, within the property, and,</u>
- <u>an Outer Protection Area managed for hazard reduction and located on the bushland side</u> <u>of the perimeter road"</u>

APZs will be provided to comply with PBP as detailed in Section 4.2. Perimeter access is also proposed.

Provision 5

"for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the draft LEP permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with"

Section 4.2 details compliant APZs.



Provision 6

<u>"contain provisions for two-way access roads which links to perimeter roads and/or to fire trail</u> <u>networks</u>"

The masterplan features two-way roads linked to perimeter roads. The proposed road layout is compliant with PBP. More detail on the proposed access is detailed in Section 4.2.

Provision 7

"contain provisions for adequate water supply for fire-fighting purposes"

All aspects of future development will have a hydrant supply that complies with PBP. More details are provided at Section 4.2.

Provision 8

"minimise the perimeter of the area of land interfacing the hazard which may be developed"

The hazard interface is defined by the avoided land and koala habitat corridor. Hazard interface areas are not excessive and do not create incursions of hazard into the development, 'bottle-necks' or 'pinch-points'.

Provision 9

"introduce controls on the placement of combustible materials in the Inner Protection Area"

Section 4.2 details the how the site and any APZs are to be maintained.

4.2 Planning for Bush Fire Protection 2019 (PBP)

Compliance with 'Planning for Bush Fire Protection 2019' (PBP) is achieved by addressing the aim and objectives of PBP and the objectives specific to warehouse developments (refer to Section 2.2.1 for assessment requirements). Sections 4.2.1 to 4.2.4 below outline the bushfire protection measures integrated into the design to ensure compliance with PBP.

4.2.1 Asset Protection Zones (APZ) and defendable space

For habitable development types such as dwellings, the application of a bushfire hazard building setback (i.e. APZ) is related to the vulnerability of an asset typically in terms of combustibility of external materials or the nature of the occupants. The resulting APZ dimension would stipulate a building construction standard under Australian Standard *AS* 3959-2018 Construction of buildings in bushfire-prone areas (AS 3959).

As future development will not include a dwelling or habitable building, PBP does not prescribe an APZ dimension. The general fire safety requirements of the NCC are accepted as adequate bushfire protection for the development of building Class 5 to 8 which includes industrial facilities, warehouses and office space.

However, PBP Objective (b) requires the application of a managed hazard-separation area for fire-fighting purposes referred to as 'defendable space'. A defendable space is an area between



the building and the bushfire hazard that provides an environment in which fire-fighters can undertake property protection after the passage of a bushfire with some level of safety. PBP Objective (c) also requires hazard separation to prevent fire spread to buildings in combination with construction measures.

NSW Rural Fire Service (RFS) require new development areas to have an APZ to prevent flame contact on future buildings, determined by Bushfire Attack Level BAL-FZ in accordance with PBP Tables A1.12.5-7. An APZ based on BAL-FZ is considered acceptable in achieving PBP Objectives (b) and (c), in combination with other protection measures (discussed below), for general industrial uses whereby construction materials are typically non-combustible and meet NCC building and structural fire requirements.

Using the hazard parameters of vegetation and slope discussed in Section 3, APZ distances have been determined in accordance with BAL-FZ from Table A1.12.5 of PBP. The APZ calculation is listed in Table 1 below and mapped on Figure 4.

The APZ will act as the defendable space and will include an 8 m wide perimeter road. The design requirements for roads are specified in Section 4.2.4. The APZ and development site is to be managed to the standard of an Inner Protection Area (IPA) as described by PBP. Vegetation management requirements are discussed in Section 4.2.3.

Hazard interface ¹	Vegetation ²	Slope ³	APZ ⁴
A	Forest	Downslope >5-10°	28 m
В	Forest	Downslope >0-5°	22 m
С	Forest	Downslope >5-10°	28 m
D	Forest	Upslope / Flat	18 m
E	Forest	Downslope >0-5°	22 m
F	Forest	Downslope >5-10°	28 m
G	Forest	Downslope >10-15°	36 m
Н	Forest	Upslope / Flat	18 m
I	Forest	Downslope >0-5°	22 m
J	Forest	Downslope >5-10 ^o	28 m
К	Grassland	Downslope >0-5°	22 m
L	Low hazard	Downslope >0-5 ^o	22 m

	Table	1: APZ	determination
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¹ Hazard interface areas as shown on Figure 4.

² Predominant vegetation classification over 140 m from urban capable area.

³ Effective slope assessed over 100 m from urban capable area where the bushfire hazard occurs.

⁴ BAL-FZ distance in accordance with 'Planning for Bush Fire Protection 2019' Table A1.12.5.



4.2.2 Construction standards

As introduced in Section 2.2.1, building construction provisions for bushfire protection within Australian Standard *AS* 3959-2018 Construction of buildings in bushfire-prone areas (AS 3959) do not apply to developments of the type proposed as a deemed-to-satisfy requirement under the NCC. Due to the type of development and compliance with NCC requirements for building and structural fire, it is generally accepted that buildings will survive bushfire attack. In addition, staff will not reside at the site and will be familiar with evacuation routes.

However, as stated within Section 8.3.1 of PBP, consideration of building construction provisions is required to satisfy the aim and objectives of PBP and the assessment of which is to be made on a case-by-case basis.

The Bushfire Attack Levels (BAL) impacting the development site are mapped on Figure 5. Figure 5 demonstrates that although the southern and western elevations of future warehouses may be impacted by BAL-40, BAL-29 and BAL-19, these impacted areas are small relative to the remainder of the building footprint and the development site overall. The materials used for warehouse construction typically comply with these BALs, however buildings may not be protected from ember attack; an integral component of all BALs.

Due to the expansive forested areas adjoining, ember protection measures from BAL-12.5 provisions listed within Section 5 of AS 3959-2018 should be applied to future warehouses. The relevant ember protection measures from BAL-12.5 are listed below.

- 5.4.2 Joints
- 5.4.3 Vents and weepholes
- 5.5.3 Windows and sidelights

• (v)

• 5.5.4 Doors - side-hung external doors

o (c), (v) and (vii)

• 5.5.6 Doors - vehicle access doors

o (b) and (c)

- 5.6.1 Roofs general
 - \circ (b), (c) and (d)
- 5.6.2 Tiled roofs
- 5.6.3 Sheet roofs
- 5.6.5 Roof penetrations
 - o (a), (b), (c), (d), (e), (f) and (h)



- 5.6.6 Eaves lining, facias and gables
 - \circ (b) and (c)
- 5.6.7 Gutters and downpipes
 - (a) and (b)



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Legend





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Figure 5: Bushfire Attack Level

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4.2.3 Vegetation management and landscaping

The APZs and entire development site (not including the koala habitat corridor, avoided land and riparian areas) are to be managed and landscaped to achieve the fuel management standard of an Inner Protection Area (IPA) as described within Appendix A4.1.1 of PBP. The following is a summary of the IPA requirements:

Trees

- Tree canopies at maturity should not overhang or be within 2 m of a building.
- Tree canopies should not be connected between the hazard and a building. Gaps between crowns or groups of crowns are to be maintained at distances of at least 2 m. The retention of rows of trees such as at boundary locations, is permissible by PBP and satisfies IPA requirements in this instance as the trees will not provide a direct path between the identified bushfire hazards and buildings.

<u>Shrubs</u>

• Shrubs are to be limited and be within managed garden beds to prevent the spread of fire towards buildings.

Groundcovers

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height).
- Fine fuels on the ground such as leaves and twigs should be regularly removed.

4.2.4 Access

Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response.

The site will have a primary public road access point onto Wilton Park Road to the north complemented by an 8 m wide emergency fire access road at the western and eastern ends, as well as two 6 m wide fire access roads within the development. The multiple access roads ensure compliance with PBP in regard to alternate access for evacuation and operational response.

Perimeter access

An 8 m wide perimeter access road is provided between the development site and the hazard interface to the south and west. The road will be linked back to the internal public road at regular intervals. Wilton Park Road and Berwick Park Road act as perimeter roads to the grassland hazard to the north and the Hume Motorway acts as a perimeter road to the grassland hazards to the east. The perimeter road access strategy complies with PBP.



Design and construction standards

The internal public roads are to comply with the PBP Acceptable Solutions for roads in bushfire prone areas as listed within PBP Table 5.3b. The requirements are repeated below.

- Property access roads are two-wheel drive, all weather roads.
- Perimeter roads are provided for residential subdivisions of three or more allotments.
- Subdivisions of three or more allotments have more than one access in an out of the development.
- Traffic management devices are constructed to not prohibit access by emergency service vehicles.
- Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.
- All roads are through roads.
- Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end.
- Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.
- Where access/egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.
- One way 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.
- The capacity of perimeter and non-perimeter road surfaces and any bridges and causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges/causeways to clearly indicate load rating.
- 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 AS 2419.1:2005 Fire hydrant installations: System design, installation and commissioning.
- There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.
- Perimeter roads are:
 - o two-way sealed roads;
 - o minimum 8 m carriageway width kerb to kerb;



- o parking is provided outside of the carriageway width;
- o hydrants are located clear or parking reserves;
- through roads, and these are linked to the internal road system at an internal of no greater than 500 m;
- o curves of roads have a minimum inner radius of 6 m;
- the maximum road grade is 15° and average grade of not more than 10°;
- the road crossfall does not exceed 3°;
- a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.
- Non-perimeter roads are:
 - *Minimum* 5.5 *m* width kerb to kerb;
 - o parking is provided outside of the carriageway width;
 - o hydrants are located clear or parking areas;
 - through roads, and these are linked to the internal road system at an internal of no greater than 500 m;
 - o curves of roads have a minimum inner radius of 6 m;
 - the road crossfall does not exceed 3°;
 - a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.

4.2.5 Water supply for fire-fighting

Future buildings will require fire hydrants to be installed along road reserves to comply with AS 2419.1 - 2005 Fire Hydrant Installations - System Design, Installation and Commissioning (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

Hydrants should also be installed along the perimeter road at intervals not exceeding 140 m.



5 Conclusion and recommendations

The information presented in this Bushfire Assessment Report demonstrates that the proposal to amend the zoning at the subject land to allow future warehouse developments can satisfy the Ministerial Direction No. 4.3 – 'Planning for Bush Fire Protection' and the requirements of 'Planning for Bush Fire Protection 2019'. This is achieved by providing compliant bushfire protection measures such as APZs and adequate access.

The masterplan demonstrates the application of complaint APZs and access and will facilitate future development applications.

Bushfire protection measures recommended within this report to achieve the requirements are listed below:

- Provision of APZ building setbacks to all identified bushfire hazards as shown on Figure 4.
- Application of ember protection construction measures to future buildings as listed in Section 4.2.2.
- Vegetation and landscaping across APZs and the development site is to be maintained to achieve the standard of Inner Protection Area (IPA).
- Public road design is to comply with Table 5.3b of 'Planning for Bush Fire Protection 2019'. Alternate access is to be provided to the external road system to the north.
- A perimeter road (8 m) wide is to be provided to the southern and western sides of the development site. Regular links to the internal public road are required.
- Hydrants are to be installed along the public road network and perimeter roads in accordance with AS 2419.1:2005 Fire hydrant installations: System design, installation and commissioning.







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Standards Australia 2005. *Fire hydrant installations - System design, installation and commissioning,* AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.

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