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Bushfire Protection Assessment – Sydney Business Park Stage 3

Marsden Park Developments

DOCUMENT TRACKING

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Template 2.8.1

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Abbreviations

Abbreviation	Description
AS 3959	Australian Standard AS 3959-2018 <i>Construction of buildings in bushfire prone areas</i>
APZ	Asset protection zone
BAL	Bushfire attack level
BFPL	Bush fire prone land
CDC	Complying development certification
DA	Development application
DtS	Deemed-to-satisfy
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
FDI	Fire danger index
IPA	Inner protection area
NCC	National Construction Code
OPA	Outer protection area
PBP	Planning for Bush fire Protection 2019
RFS	NSW Rural Fire Service

1. Property and proposal

The table below (**Table 1**) identifies the subject property and outlines the type of development proposed.

Table 1: Subject site and development proposal summary

Street address:	Astoria and Hollinsworth Street, Marsden Park
Postcode:	2765
Lot/DP no:	Lot 4 DP 1210172, Lot 36 DP 262886 and part Lot 5 DP 1210172
Local Government Area:	Blacktown City Council
Fire Danger Index (FDI)	100
Current land zoning:	SP2 Infrastructure, IN1 General Industrial, IN2 Light Industrial
Type of development proposed:	Industrial development (subdivision and construction of 4 warehouses)

1.1 Description of proposal

The proposal is for subdivision and construction of 4 industrial warehouses and associated carparking (see **Figure 1**). The proposed subdivision forms Stage 3 of the Marsden Park Industrial Precinct.

The subdivision is located on land classified as bush fire prone on the Blacktown City Council bush fire prone land (BFPL) map¹.

1.2 Assessment process

The proposal was assessed in accordance with Section 4.14 of the *Environmental Planning and Assessment Act 1979* and *Planning for Bush Fire Protection (RFS 2019)*, herein referred to as PBP.

The proposal is for an industrial subdivision and construction of 4 warehouses (no manager’s residence) therefore, has been assessed in accordance with the aim and objectives of PBP. Chapter 7 of PBP has been utilised as a guide in developing relevant bushfire protection measures (BMP) commensurate with the bushfire risk to the site.

This assessment is based on the following information sources:

- Background documentation provided by Marsden Park Developments;
- Information contained within the site plan from Reid Campbell (Project 1200045 Issue G); and
- GIS analysis including online spatial resources (i.e. Google Earth, SIX Maps, Nearmap and the NSW Government Planning Portal).

Table 2 identifies the bushfire protection measures proposed and assessed.

¹ <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

Table 2: Summary of bushfire protection measures proposed and assessed

Bushfire Protection Measure	Report Section
Asset Protection Zones	3.3
Landscaping	3.4
Construction standard	3.5
Access	3.6
Water supply	3.7
Electrical services	3.8
Gas services	3.9

1.3 Significant environmental features

The subject land is situated within the Sydney Growth Centres biodiversity certified areas. In August 2017, the *Biodiversity Conservation Act 2016* (BC Act) was gazetted and repealed the *Threatened Species Conservation Act 1995* (TSC Act), however under section 43 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, the repeal of the TSC Act does not affect the operation of part 7 or 8 of Schedule 7 to that Act. The effect is that the Biodiversity Certification of the Growth Centres continues to have effect under the new legislation. Biodiversity certification removes the need to conduct impact assessment on certified land for threatened species population and communities listed under the BC Act.

The impact footprint of the bushfire protection measures (e.g. Asset Protection Zone (APZ)) is clearly identified within this report and therefore capable of being assessed by suitably qualified persons as required. NSW Department of Planning, Industry and Environment (DPIE) is the determining authority for this development; they will assess more thoroughly any potential environmental issues.

1.4 Aboriginal cultural heritage

An assessment of any Aboriginal cultural heritage objects (within the meaning of the *National Parks and Wildlife Act 1974*) that may potentially be affected by the proposed bushfire protection measures has not been undertaken in this report as it is covered by other parts of the Development Application (DA) process.

The impact footprint of the bushfire protection measures (e.g. APZ) is clearly identified within this report and therefore capable of being assessed by suitably qualified persons as required. DPIE is the determining authority for this development; they will assess more thoroughly any potential Aboriginal cultural heritage issues.



Figure 1: Subdivision layout and built form

2. Bushfire hazard assessment

2.1 Process

The site assessment methodology set out in Appendix 1 of PBP has been utilised in this assessment to determine the required APZ and Construction requirements.

Figure 2 and show the effective slope and predominant vegetation representing the highest bushfire threat potentially posed to the subdivision from various directions.

2.2 Vegetation assessment

In accordance with PBP, the predominant vegetation formation has been assessed for a distance of at least 140 m from the subject land in all directions.

The predominant vegetation has been determined from the Department of Planning, Industry and Environment mapping (DPIE 2013).

2.3 Slope assessment

In accordance with PBP, the slope that would most significantly influence fire behaviour was determined over a distance of 100 m from the outside edge of the APZ under the classified vegetation.

The effective slope has been determined from 2 m contour data.

2.4 Summary of assessment

As shown in **Figure 2** there are two (2) bushfire hazards within 140 m of the proposed development.

To the east and south-west, the vegetation is identified as *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion* (DPIE 2013) which falls within the Coastal Valley Grassy Woodlands vegetation class (Keith 2004) and classified as ‘woodland’ under PBP. The effective slope under the hazard in the east falls within the PBP slope category of ‘All upslopes and flat land’ whilst to the south-west, ‘>0-5 degrees downslope’.

The secondary hazard is located to the west and south and identified as *Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion* (DPIE 2013) which falls within the Cumberland Dry Sclerophyll Forests vegetation class (Keith 2004) and is classified as ‘forest’ under PBP. Some of this vegetation exists within the boundaries of the subject land as shown in **Figure 2**. This vegetation is non-certified and will be retained. The effective slope under this hazard falls within the PBP slope category of ‘>0-5 degrees downslope’.

There is a temporary grassland hazard to the south of Warehouse 1 (**Figure 2**), this area will be subject to future development which will remove this hazard.

In all other directions the land is managed consisting of land cleared for future industrial development and existing residential development and road reserves.

Table 3: Bushfire hazard assessment, APZ requirements and BALs

Transect # (Figure 2)	Slope	Vegetation Formation	Available APZ	Comments
Warehouse 1				
4 (West)	>0° to 5° downslope	Forest	≥71 m	APZ provided wholly within boundaries of subject land.
5 (South)	>0° to 5° downslope	Grassland	≥10 m	As above
All other directions		Managed land		
Warehouse 2				
1 (East)	All upslope and flat land	Woodland	≥29 m	APZ provided wholly within boundaries of subject land.
5 (South)	>0° to 5° downslope	Grassland	≥70 m	As above
All other directions		Managed land		
Warehouse 3				
All directions		Managed land		
Warehouse 4				
2 (South)	>0° to 5° downslope	Forest	≥8-20 m	APZ provided wholly within boundaries of subject land. Approximately 0.06% of the building has less than 10 m APZ.
3 (South-west)	>0° to 5° downslope	Woodland	≥27 m	As above
All other directions		Managed land		



Figure 2: Bushfire hazard assessment

3. Bushfire protection measures

3.1 Specific aim and objectives for Industrial/commercial development

Below is the Aim of PBP and the Specific Objectives for industrial/commercial development and a comment on how they are achieved. As directed in section 8.3.10 of PBP, the bushfire protection measures identified in Chapter 7 (of PBP) have been used as the baseline (where applicable), and either the acceptable solution or performance criteria has been achieved:

- **Aim** - 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.
 - The proposed development complies with the aim of PBP by achieving the specific objectives for industrial / commercial development and for Class 5-8 buildings identified below.
- **Specific Objective 1** - afford buildings and their occupants protection from exposure to a bush fire;
 - Each building provides defensible space by adequate APZ and perimeter access as shown in **Figure 1** and **Figure 2**. All roads link to a public road network and comply with Section 7 of PBP providing safe evacuation routes for occupants.
- **Specific Objective 2** - provide for a defensible space to be located around buildings;
 - Defensible space is provided to all proposed warehouses by way of perimeter access/road and APZ as shown in **Figure 1** and **2**.
- **Specific Objective 3** - provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
 - All buildings have suitable defensible space between hazard and buildings as well as perimeter access around all buildings to allow emergency service personal an adequate operational area for prevention of fire spread.
- **Specific Objective 4** - ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
 - The development has direct access to the public road system affording safe operational access/egress to emergency services as shown in **Figure 1**, **Figure 2** and demonstrated further in Section 3.6 meeting the specific objectives under Section 3.2.
- **Specific Objective 5** - provide for ongoing management and maintenance of BPMs; and
 - The entire development will be managed as an IPA as per the specifications outlined in Appendix A.
- **Specific Objective 6** - ensure that utility services are adequate to meet the needs of firefighters.
 - The development is capable of complying with the acceptable solutions for utilities under Section 7 of PBP (Section 3.7 – 3.9) and specific objective 3 in Section 3.2.

3.2 Specific objectives for Class 5-8 buildings

Below are the Specific Objectives for Class 5-8 buildings and a comment on how they are achieved.

- **Specific Objective 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.
 - As shown in **Figure 1** and **Figure 2** and demonstrated further in Section 3.6 of this report, the proposed development has direct access to the public road system providing safe access/egress for both firefighters and occupants.
- **Specific Objective 2** - provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.
 - An emergency plan meeting requirements of the Work Health safety Regulation 2017 and relevant legislation is to be prepared for each building (refer Section 3.11).
- **Specific Objective 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.
 - The proposed development will be serviced by reticulated water and each building has additional dedicated sprinkler water supply. Electricity to the development is underground and complies with PBP. Supply of gas (if any) will be installed and maintained in accordance with Section 3.9 of this report.
- **Specific Objective 4** - provide for the storage of hazardous materials away from the hazard wherever possible.
 - The buildings within the proposed development will be required to store any hazardous materials (if any) in accordance with the relevant safety guidelines and safety data sheets.

3.3 Asset Protection Zones

Table 3 and **Figure 2** shows the separation distance between the proposed development and the bushfire hazard (APZ) and where relevant, information on how the APZ is to be provided is included.

The compliance of the proposed APZ with Section 7.4 of PBP, is detailed in **Table 4**.

The National Construction Standard (NCC) does not capture bushfire for this type of development, instead the specific objectives in PBP apply (Section 3.1 and 3.2).

Table 4: APZ requirements and compliance (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
APZs are provided commensurate with the construction of the building; and A defensible space is provided;	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	Complies with performance criteria and achieves PBP specific objectives (refer Section 3.2) Defensible space is provided to all proposed warehouses by way of perimeter access/road as shown in Figure 1 and 2 .
APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	To Comply Proposed APZ to be managed in accordance with PBP. Fuel

Performance Criteria	Acceptable Solutions	Compliance Notes
		management specifications provided in Appendix A .
The APZ is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	Complies Proposed APZ wholly within boundaries of development site.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	Complies APZ is not located on slopes greater than 18°.

3.4 Landscaping

The compliance of the proposed landscaping with Section 7.4 of PBP is detailed in **Table 5**.

Table 5: Landscaping requirements and compliance (adopted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Landscaping is managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Compliance with the NSW RFS ‘Asset protection zone standards’ (Appendix 4 PBP);	To comply APZ / Landscaping is to be managed in accordance with PBP. Landscaping specifications provided in Appendix A .
	A clear area of low-cut lawn or pavement is maintained adjacent to the house;	
	Fencing is constructed in accordance with Section 7.6 of PBP.	
	Trees and shrubs are located so that: <ul style="list-style-type: none"> - the branches will not overhang the roof; - the tree canopy is not continuous; and - any proposed wind break is located on the elevation from which fires are likely to approach. 	To comply APZ / Landscaping is to be managed in accordance with PBP. Landscaping specifications provided in Appendix A .

3.5 Construction standards

The NCC does not require this type of building class to comply with AS 3959:2018, so this should be used as a guide as often the nature of this construction type (i.e. industrial building using concrete tilt slab with metal roofing) meets the requirements of AS 3959:2018.

The general fire safety construction provisions for this building type are considered suitable (acceptable solutions) and modified to incorporate the following ember protection upgrades from AS 3959-2018:

- The roof/wall junctions are to be sealed/screened with aluminium, steel or bronze mesh with a minimum aperture size of 2 mm;
- All openable portions of windows to be screened with aluminium, steel or bronze mesh with a minimum aperture size of 2 mm;

- The base of side-hung external doors shall be fitted with draught excluders/draught seals/weather strips;
- Gutters should be fitted with non-combustible gutter guard to prevent the build-up of combustible material;
- The rollers doors shall be protected with suitable weather strips/draught excluders/draught seals or brushes (Figure 3). If fitted with guide tracks no edge gap protection required; and
- Roller shutter doors with ventilation slots shall be protected with non-combustible mesh with 2 mm aperture.

These measures apply to all buildings aside from Warehouse 3 which is greater than 100 m from any bushfire hazard.

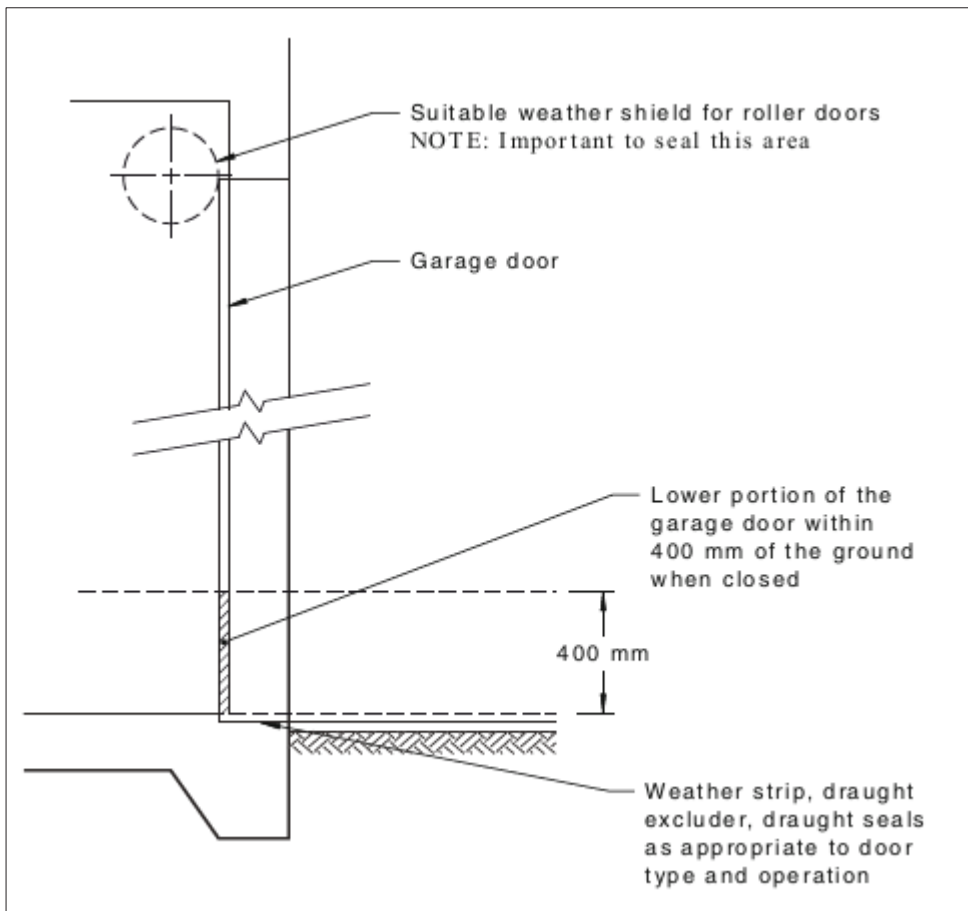


Figure 3: Roller shutter door installation (SA 2018)

3.5.1 Fences and gates

To comply with Section 7.6 of PBP, all fencing and gates within bushfire prone areas are to be constructed of hardwood or non-combustible material. Where fencing is within 6 m of a building, they should be made of non-combustible material only.

3.6 Access

Public access to and within the proposed development meets the specific objectives of PBP (Section 3.1 and 3.2) based on the following:

- All access roads within the development are two-wheel drive, all-weather roads;

- The capacity of road surfaces (including bridges/causeways if any) will have minimum carry load of 23 tonnes and bridges/causeways to clearly indicate load rating;
- Hydrants will be provided in accordance with AS 2419:1:2005 (SA 2005);
- There is suitable access for Category 1 fire tanker to access all structures;
- Perimeter access is provided along the hazard interface and around each building for emergency services, at a minimum 6 m wide which complies with ‘non-perimeter road’ requirements under PBP;
- Internal roads are minimum 6 m wide;
- Public roads are greater than 8 m kerb to kerb, linked to an internal road system at intervals no greater than 500 m;
- All roads within the development meet the acceptable solutions/performance criteria for public roads under Section 7 of PBP.

3.7 Water supplies

The compliance of the proposed water supply with Section 7.4 of PBP is detailed in **Table 6**.

Table 6: Water supply requirements (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available; A static water supply is provided where no reticulated water is available.	Complies Proposal serviced by a reticulated water supply. Additional sprinkler water tanks are located at each building.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1 (SA 2005); Hydrants are not located within any road carriageway; and Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Can comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 7.4a of PBP.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1 (SA 2005).	
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps; and Above-ground water storage tanks shall be of concrete or metal.	

3.8 Electricity services

The compliance of the proposed supply of electricity services with Section 7.4 of PBP is detailed in **Table 7**.

Table 7: Requirements for the supply of Electricity services (adapted from Table 7.4a of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground;	Complies Electricity services to the subject site are located underground.
	Where overhead, electrical transmission lines are proposed as follows: Lines are installed with short pole spacing (30 m), unless crossing gullies, gorges or riparian areas; and No part of a tree is closer to a power line than the distance set out in ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets (ISSC3 2016).	Not applicable.

3.9 Gas services

The compliance of the proposed supply of gas services (reticulated or bottle gas) with Section 7.4 of PBP is detailed in **Table 8**.

Table 8: Requirements for the supply of gas services (adapted from Table 5.3c of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 – The Storage and handling of LP gas, 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 10 m 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.	To comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and table 5.3c of PBP.

3.10 Staged development

The proposed development will be constructed in a staged manner and it is the responsibility of the proponent to implement the identified bushfire protection measures to each stage as identified in this assessment. Implementation of these measures may be temporary in nature (i.e. APZ, fire trails, turning areas) until future stages are developed.

3.11 Emergency and Evacuation Planning

Due to the nature and use of the proposed development and due to the surrounding bushfire hazard being removed/reduced over time an emergency plan meeting requirements of the Work Health safety Regulation 2017, relevant legislation and building requirement of the NCC is considered suitable and commensurate to risk for this development.

4. Conclusion

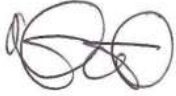
The proposed development meets the specific objectives of *'Planning for Bush Fire Protection 2019'*, as outlined in **Table 9** below.

Table 9: Development Bushfire Protection Solutions and Recommendations

Bushfire Protection Measures	Recommendations	Report Section
Asset Protection Zones	This assessment indicates the proposed development will comply with the PBP APZ performance criteria (Figure 4). Identified APZ to be maintained in perpetuity to the specifications detailed in Appendix A .	3.3
Landscaping	Any future landscaping meets the requirements of PBP listed in Appendix A .	3.4
Construction standard	Buildings within the development are to be constructed in accordance with the NCC fire safety provisions with additional ember protection as identified in Section 3.5 of this report.	3.5
Access	Access to meet specific objectives as per Section 3.2 and 3.5 of this report.	3.6
Water supply	Reticulated water supply to meet PBP acceptable solution specifications for a subdivision.	3.7
Electricity service	Electricity supply located underground.	3.8
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	3.9
Emergency and Evacuation Planning	Emergency plan meeting requirements of the Work Health safety Regulation 2017 and relevant legislation is to be prepared for each building.	3.11

5. Recommendations

It is recommended that the proposed development be approved with consent conditions based on the findings in **Table 9**.



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Appendix A - Asset protection zone and landscaping standards

The following APZ management specifications in **Table 10** apply to the APZs specified in **Table 3** and shown in **Figure 2**. These APZ management specifications should be considered for any landscaping and ongoing management within the subject land.

The APZs identified in **Table 3** are to be maintained in perpetuity and management undertaken on an annual basis (as a minimum) and prior to the commencement of the fire season.

Further details on APZ implementation and management can be found on the NSW RFS website (<https://www.rfs.nsw.gov.au/resources/publications>).

Table 10: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)
Trees	<p>Tree canopy cover should be less than 15% at maturity;</p> <p>Trees (at maturity) should not touch or overhang the building;</p> <p>Lower limbs should be removed up to a height of 2 m above ground;</p> <p>Canopies should be separated by 2 to 5 m; and</p> <p>Preference should be given to smooth barked and evergreen trees.</p>
Shrubs	<p>Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;</p> <p>Shrubs should not be located under trees;</p> <p>Shrubs should not form more than 10% ground cover; and</p> <p>Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.</p>
Grass	<p>Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and</p> <p>Leaves and vegetation debris should be removed.</p>

