BUSHFIRE ASSESSMENT REPORT

Proposed Childcare Centre

16 Chapman Street, Werrington NOV 2021

ARCHIDROME

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Advanced
Bushfire Performance Solutions

Bush Fire Assessment Report

s.100B 'Special Fire Protection Purpose'

Lot 4001 within subdivision of Lot 1 DP 1226122
16 Chapman Street, Werrington NSW

Prepared for
The Bathla Group

November 2021

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The analysis, assessment and recommendations contained in the following Bushfire Assessment Report, are the sole views of Advanced Bushfire Performance Solutions Pty Ltd. The bushfire protection assessment, recommendations and strategies contained in this report are intended to address the submission requirements for DAs on bush fire prone land as outlined in appendix 4 of *Planning for Bush Fire Protection* 2006.

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Document Control

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1 Executive summary

Advanced Bushfire Performance Solutions Pty Ltd has been engaged by the developer, The Bathla Group, to prepare a Bush Fire Assessment Report and certificate to demonstrate how the development application conforms to the relevant specifications and requirements of *Planning for Bush Fire Protection*, or any other document prescribed by the regulations, relevant to the development.

The development application proposes the construction of a new Child Care Centre. This development is a Special Fire Protection Purpose (SFPP).

The assessment within this report relies on an acceptable solution as specified in *Appendix 1* and Table A1.12.1 of *Planning for Bush Fire Protection* 2019.

The site is not within 140m of unmanaged bushfire hazard vegetation.

The site can directly access a public access road via a complying property access road.

Water is available via a reticulated mains system. An onsite water storage tank will be provided if no hydrant is located within 90m of all parts of the building. The tank will provide a minimum 5,000L capacity.

All proposed landscaping will be consistent with maintaining IPA standards.

A Bush Fire Emergency Management and Evacuation Plan will be prepared prior to occupancy.

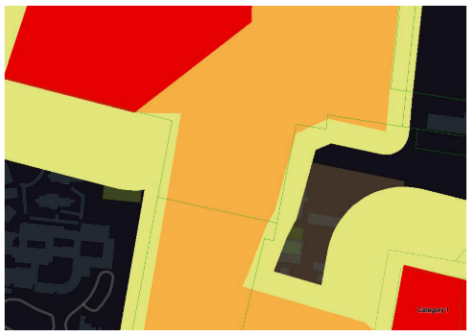
The proposed development complies with the specifications and requirements of *Planning for Bush Fire Protection*.

2 Proposed Development

Is the proposal on bush fire prone land

The site is within the bushfire prone land on the **NSW Rural Fire Service** Bush Fire Prone Land Map.

The area about Lot 4001 is a Category 2 bushfire hazard

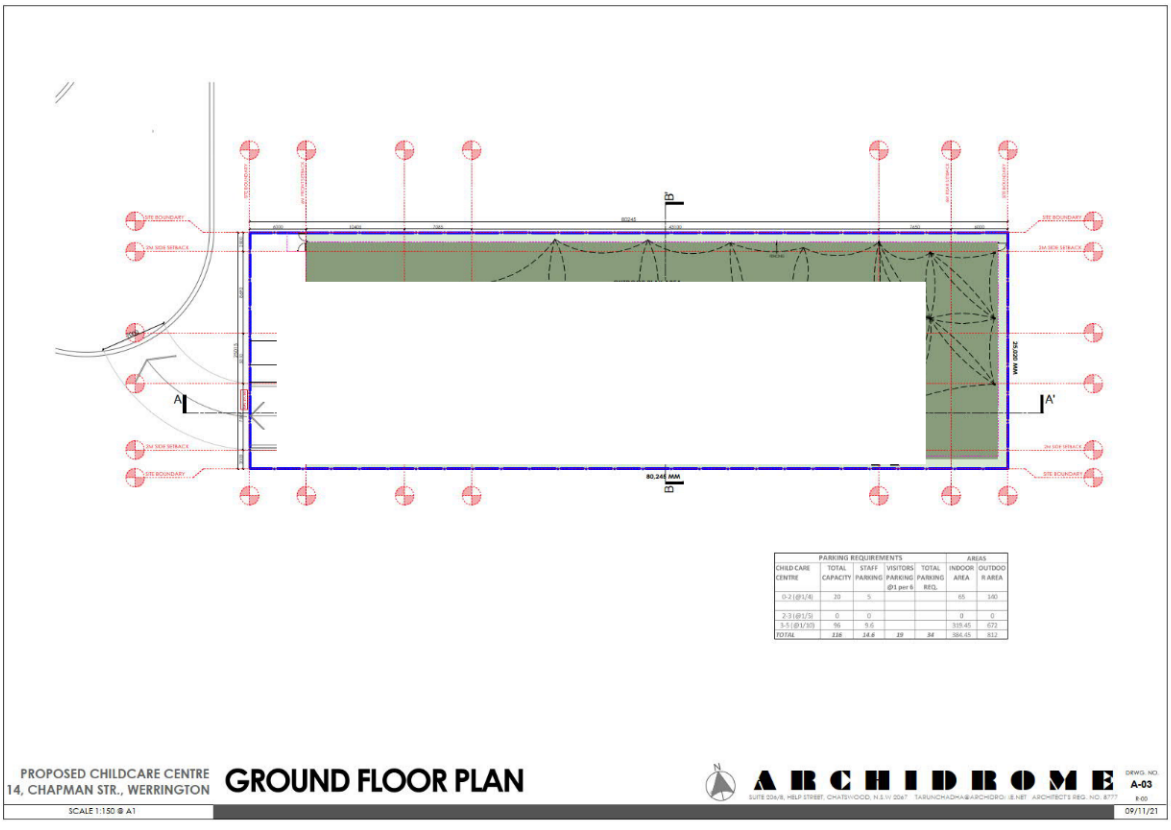


Your search result

You have conducted a search of the online bush fire prone land tool for the land in the map above. This search result is valid for the date the search was conducted. If you have any questions about the Bush Fire Prone Land Tool please contact bushfireprone.mapping@rfs.nsw.gov.au

The parcel of land you have selected is within a designated bush fire prone area.

Plan



Plan Reference

Ground Floor Plan Dwg: A-03 Dated: 09/11/2021

3 Assessment Details

Bushfire Assessment Plan

Vegetation

- The site is not within 140m of unmanaged bushfire hazard vegetation.
- The site was inspected on 17 November 2021
- The site is located adjacent to an existing school to the east and managed rural property to the south. New subdivision development will remove all vegetation to the north and west.
- The rural lot to the south is expected to continue the residential urban expansion of the northern development. This lot is currently a regularly mowed paddock.

- View east to west along the southern boundary of Lot 4001 from the eastern boundary with Wollemi college. Cobham Detention Centre is in the background.

Aspect	Vegetation
East	Excludable - A1.10
South West	Forest
West	Forest
North West	Grassland

Slope

- The slope analysis for this development was undertaken using contours derived from 1m LiDAR DEM sourced from Dept of Planning – Land Property Information (LPI).
- This elevation data has been processed to achieve 'Category 1' DEM products as described by the ICSM (Intergovernmental committee on Surveying & Mapping) Guidelines for Digital Elevation Data which specifies accuracies not exceeding 30cm with 2 sigma or 95% confidence. This data has been validated by independent Register Surveyors as being accurate for the purposes of bushfire assessments.
- Slopes are assessed over 100m where possible or to the major change in slope where 100m is not possible. Slope assessments may also include the influence of cliffs/escarpments/rocks or other features on bushfire behaviour.
- The terrain is a shallow floodplain that falls gently to the northeast and east towards Claremont Creek
- No slope assessment is required as there is no bushfire hazard vegetation within 140m of the proposed development.

Transect	Near elevation	Far elevation	Run	US/CS/DS	Slope	Range

Mitigating factors

- None

Setback

- Setbacks are measured from the edge of the unmanaged bushfire hazard vegetation to the nearest part of the building wall or columns of the proposed works.
- Setbacks for minimum Deem-to-Satisfy Asset Protection Zones (APZ) were determined using Appendix 1 and Table A1.12.1 (see below) of *Planning for Bush Fire Protection* 2019.
- Setbacks are based on management to APZ standards as described in the NSW Rural Fire Service documents *Planning for Bush Fire Protection* 2019 and *Standards for Asset Protection Zones* (see Appendix A).
- All APZs are practical, do not compromise soil stability and negate potential crown fires within the APZ.
- Minimum setbacks are wholly contained within the lot or road reserve as described by the Bushfire Assessment Plan above.
- No APZs are proposed beyond the boundaries of the development; however existing managed lands may be relied upon for APZs. No new or additional APZ burden will be placed on adjoining landowners.

Transect	Vegetation	Slope	Slope range	Setback	Table A1.12.1	BAL	Status
North	Managed land	-	>0-5°	>100m	>100m	BAL-Low	Complies
East	Managed land	-	0°	>100m	>100m	BAL-Low	Complies
South	Managed land	-	0°	>100m	>100m	BAL-Low	Complies
West	Managed land	-	0°	>100m	>100m	BAL-Low	Complies

Management

- The asset protection zones described in the Bushfire Assessment Plan should be managed (as a minimum) to inner protection area (IPA) standards or outer protection areas as depicted in the Bushfire Assessment Plan and maintained at this standard in perpetuity.
- All asset protection zones provided within the lot will be the responsibility of the landowner or entity defined in a covenant.
- Management outcomes are detailed in Appendix A of this report.

Planning for Bush Fire Protection 2019 TABLE A1.12.1

Distance (m) of the development from the predominant vegetation class

Vegetation classification	Effective Slopes				
	Upslope/Flat	>0-5°	>5-10°	>10-15°	>15-18°
Rainforest	38	47	57	69	81
Forest	67	79	93	100	100
Woodland (Grassy and woody)	42	50	60	72	85
Forested Wetlands	34	42	51	62	73
Tall Heath	47	52	57	63	67
Short Heath	35	39	43	48	51
Arid Shrubland	25	28	32	35	38
Freshwater Wetlands	22	25	28	31	34
Alpine Complex	24	28	31	35	38
Grassland	36	40	45	50	55

Planning for Bush Fire Protection 2019 compliance provisions

BPM	Performance Criteria	Acceptable Solution	Comments	Status
Asset Protection Zones	Radiant heat levels greater than 10kW/m^2 (Calculated at 1200K) will not be experienced on any part of the building	The building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1 of PBP	Setbacks to the unmanaged bushfire hazard vegetation exceed the minimum requirements specified in Table A12.12.1.	Complies
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	APZ are located on lands with a slope less than 18 degrees	No APZ is located on slopes greater than 18°.	Complies
	APZs are managed and maintained to prevent the spread of a fire to the building	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	APZ are managed as per Appendix A	Complies
	APZ is provided in perpetuity	APZs are wholly within the boundaries of the development site	The entire site will be managed to IPA standards. Adjoining lots are managed to IPA standards.	Complies
Access	Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation	Property access roads are two-wheel drive, all-weather roads.	The property access road is sealed and all-weather	Complies
		Access is provided to all structures	The property access (driveway) provides direct access to the only building on the site. All structures are wholly within 70m of the public access road. Fire-fighting vehicles will not require an onsite access road to support bushfire suppression activities. No specific design is required for property access at this site.	Complies
		Traffic management devices are constructed to not prohibit access by emergency services vehicles	No traffic management devices will obstruct the access	Complies
		Access roads must provide suitable turning areas in accordance with Appendix 3	The public access road is a compliant cul-de-sac with a >12m radius turning circle.	Complies
		One way only 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	No public access roads to this development are one way.	NA
	The capacity of access roads is	The capacity of road surfaces and any	Road surface will support 23 tonne vehicles	Complies

	adequate for firefighting vehicles	bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes),		
		Bridges and causeways are to clearly indicate load rating	No new bridges or causeways are located along the route to this development	NA
	There is appropriate access to water supply	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression	No details of hydrant locates are currently available.	Further assessment required
		Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005	No details of hydrant locates are currently available.	Further assessment required
		There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available	Emergency services vehicles will be able to access within 4m of any hydrants located in the road verge.	Complies
	Perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	There are two-way sealed roads	There are no perimeter public access roads provided by this development.	NA
		Minimum 8m carriageway width kerb to kerb		NA
		Parking is provided outside of the carriageway width		NA
		Hydrants are to be located clear of parking areas		NA
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m		NA
		Curves of roads have a minimum inner radius of 6m		NA
		The maximum grade of the road is 15 degrees and average grade of not more than 10 degrees		NA
		The road crossfall does not exceed 3 degrees		NA
		A minimum vertical clearance of 4m to any overhanging obstructions, including		NA

		tree branches, is provided		
	Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating	Minimum 5.5m carriageway width kerb to kerb	No non-perimeter roads are proposed by this development	NA
		Parking is provided outside of the carriageway width		NA
		Hydrants are to be located clear of parking areas		NA
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m		NA
		Curves of roads have a minimum inner radius of 6m		NA
		The maximum grade of the road is 15 degrees and average grade of not more than 10 degrees		NA
		The road crossfall does not exceed 3 degrees		NA
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided		NA

Water	An adequate water supply is provided for firefighting purposes	Reticulated water is to be provided to the development, where available	The site is connected to the reticulated mains water system. Do details are available to determine the location of hydrants.	Complies
		A 10,000 litre minimum static water supply for firefighting purposes is provided for each occupied building where no reticulated water is available.		
	Water supplies are located at regular intervals	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005		
	The water supply is accessible and reliable	Hydrants are not located within any road carriageway		

	for firefighting operations	Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads		
	Flows and pressure are appropriate	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005		
	The integrity of the water supply is maintained	All above-ground water service pipes external to the building are metal, including and up to any taps		
	Water supplies are adequate in areas where reticulated water is not available	A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure	No details of proposed water supplies are provided for assessment for this report. The development proposes 1 building. PBP requires 5,000L per building. A minimum 5,000L onsite water storage tank will be required if a hydrant is not within 90m of all parts of the building. The tank should be located adjacent (within 4m) to the proposed property access road. A concrete tank will provide the best protection for the water supply; however, polycarbonate tanks may be used if protected from direct bushfire impacts by an enclosure (e.g., colorbond fence). A 65mm Storz fitting should be connected via a ball valve to metal pipes with a min internal bore size of 50mm. Underground tanks should be fitted with standpipes to facilitate quick access by fire fighters. Signs should clearly indicate the location of onsite water storage. A 'SWS' sign should be attached to the driveway entry post. Blue reflectors 'Cats-eyes' in the carriageway can assist in clearly identifying the location of water supplies.	Complies
		65mm Storz outlet with a ball valve is fitted to the outlet		
		Ball valve and pipes are adequate for water flow and are metal		
		Supply pipes from tank to ball valve have the same bore size to ensure flow volume		
		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 4m		
		Above-ground tanks are manufactured from concrete or metal		
		Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959)		
		Unobstructed access can be provided at all times		
		Underground tanks are clearly marked		
		Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters		

		All exposed water pipes external to the building are metal, including any fittings		
		Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter;		
		fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005		

Electricity	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings	Where practicable, electrical transmission lines are underground; and where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing (30m), 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 accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.	Existing power lines within the public road reserve are located underground. All new powerlines servicing the lot will be located underground.	Complies

Gas	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 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.	Reticulated gas is not connected to the site. No details regarding proposed gas services were provided for assessment for his report. Gas services, if provided, should satisfy the acceptable solutions as detailed in PBP.	Further assessment required

Construction	The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact	A construction level of BAL-12.5 under AS3959-2018 or NASH Standard and section 7.5 of PBP is applied	The building will comply with BAL-Low. AS3959-2018 has no construction specifications for buildings greater than 100m from bushfire hazard vegetation.	Complies

Additional NSW measures Ember Protection	Certain provisions of AS 3959 are varied in NSW Sarking	Clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall: be non-combustible; or comply with AS/NZS 4200.1, be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2	Sarking should be non-combustible or comply with AS/NZS 4200.1 2017 *Pliable building membranes and underlays, Part 1: Materials*. AS/NZS 4200.1 sets out requirements for materials for use as pliable building membranes (also known as sarking or underlay), when used either independently or as a facing to other materials, such as insulation materials, and as control functions for water, thermal vapour or air control. Complying products can be found online by searching for terms like 'bushfire' and 'AS/NZS 4200.1'. Products like Ametalin FireSark FS-40 and Bradford Enviroseal ProctorWrap HTR meet both requirements.	Note
	Subfloor	Clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL	Addresses requirements for unenclosed sub floor construction for the residential building but does not apply to verandas, decks, stairs and landings.	Note

	Verandas, Decks, Steps and Landings	Clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL	Addresses broader application of requirements	Note

Landscaping	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Landscaping is in accordance with Appendix 4 of PBP and	Landscaping should be consistent with APZ management recommendations in Appendix A of this report. Any new landscaping within the development should adopt (where practical) the following principles • Moisture content of leaves should be high (250-400% of dry oven weight) • Volatile oil content of leaves should be low • Mineral content of leaves should be high • Leaves should be thick (broad) with low area to volume ratio • Density of foliage should be high and less permeable to air flow • Continuity of plant form should be broken or separated • Height of lowest foliage above ground should be maximised • Size of plant should be wide spread rather than tall and narrow • Dead foliage on the plant should be minimal • Bark texture should be tight and smooth • Quantity of ground fuels should be minimised • Fineness of ground fuels should be minimised • Compaction ability of ground fuels should be maximised • Mineral content of ground fuel should be maximised • Shrubs should not be located within 1m of windows	
		fencing is constructed in accordance with section 7.6 of PBP	Existing fences are post and wire. Any new fencing should be of either hardwood timber or non-combustible material. Any fencing within 6m of the building should be non-combustible.	

Emergency	Home-based childcare: a bush fire emergency and evacuation management plan is prepared.	A Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and the AS 3745:2010.	A Bush Fire Emergency Management and Evacuation Plan is appropriate and required for this type of development. Prior to occupation, prepare an emergency/evacuation plan consistent with the RFS Guide to Developing a Bushfire Emergency Evacuation Plan. Prior to occupation, provide a copy of the Plan to the Baulkham Hills Bush Fire Management Committee. At occupation, establish an Emergency Management Committee to consult with children and their families and staff in developing and implementing an Emergency Procedures Manual At occupation, prepare and display plans of emergency assembly areas within and external to the site	

Deviations	The assessment does not deviate from the standards, specific objectives and performance criteria of *Planning for Bush Fire Protection* 2019

4 Bushfire Protection Measures - recommendations

Performance Criteria	Recommendation	Compliance
APZ	1. The lot shall be managed to inner protection area and outer protection area standards as depicted in the Bushfire Assessment Plan and as described in the RFS documents *Planning for Bush Fire Protection* 2006 and *Standards for Asset Protection Zones*.	Yes
Construction	2. None	Yes
Access	3. None	Yes
Services	4. All services shall comply with Table 6.8c of *Planning for Bush Fire Protection* 2019 5. A 5,000L onsite water storage tank is to be provided where no hydrant is located within 90m of all parts o f the building.	Yes
Landscaping	6. Landscaping shall be consistent with IPA management outcomes	Yes
Emergency	7. Prepare a Bush Fire Emergency Management and Evacuation Plan prior to occupation	Yes

Appendix A – Asset Protection Zone Standards

Planning for Bush Fire Protection 2019

Asset Protection Zone	Inner Protection Area	Outer Protection Area
A bushfire fuel reduced area surrounding a building or structure. A broken path for bushfires limits the spread of fires towards the asset.	Closest to buildings, incorporating the defendable space and for managing heat intensities at the building surface	Located between the IPA and the unmanaged bushfire hazard vegetation. Reduces the potential length of flames by slowing the rate of spread, filtering embers and suppressing crown fire. Only effective in forests.
A defendable space is a subset of an APZ	Trees: Canopy cover should be less than 15% projected foliage cover. Canopies should be separated by 2 to 5m. Should not touch or overhang buildings. Trees (trunks) should not be within 5m of a building. Lower limbs within 2m of the ground should be pruned. Preference should be given to smooth-barked and evergreen species.	Trees: Canopy cover should be less than 30% projected foliage cover. Canopies should be separated by 2 to 5m.
Where an APZ easement is established to the benefit of Community Title is shall be maintained in accordance with a Plan of Management	Shrubs: Should not form a continuous canopy or fire path. Should not form more than 10% of ground cover. Should be clustered into distinct and isolated 'islands' away from trees. Clusters should be located a distance (twice the height of the shrubs) away from exposed windows and doors.	Shrubs: Should not form a continuous canopy. Should not form more than 20% of ground cover. Should be clustered into distinct and isolated 'islands' away from trees.
APZs are managed and maintained to prevent the spread of fire towards the building. In accordance with the requirements of Standards for Asset Protection Zones (RFS,2005)	Grass: Should be mown/maintained to less than 100mm. Leaves and debris should be regularly removed. Should be maintained in perpetuity and in particular leading up to a fire season	Grass: Should be mown/maintained to less than 100mm. Leaves and debris should be regularly removed. Should be maintained in perpetuity and in particular leading up to a fire season
Location of APZs on slopes >18 is not recommended for new development on wooded vegetation due to environmental constraints and difficulties in management. In addition, vegetation could carry a canopy fire without the support of understorey fuel		
Retention of taller trees will assist in filtering out embers		

Standards for Asset Protection Zones

Asset Protection Zone	Inner Protection Area	Outer Protection Area
APZ is a fuel reduced area surrounding a built asset or structure		
APZ should be wholly located with your land		
Fallen ground fuels <6mm dia and bark should be removed on a regular basis		
Grasses need to be kept short and where possible green		
Separate tree crowns by 2-5m		
Canopy should not overhang within 2-5m of a dwelling		
Native trees and shrubs should be retained as clumps or islands and should maintain a covering of <20% of the area.		
Ensure there is no contiguous fuel path to the dwelling		
Fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts, and vegetable gardens are permitted in an APZ		