AustralianBushfireSolutions

BUSHFIRE ASSESSMENT REPORT

FOR INFILL DEVELOPMENT – 5 LOT SUBDIVISION (STRATA)

Lot 1 DP 619081

39-41 TYNDALL STREET

MITTAGONG NSW 2575

Site Visit: 1 February 2021 **Report Date: 13 April 2021**

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Executive Summary

This report has been prepared for Luciano Liberale, by Australian Bushfire Solutions, PO Box 498, Bowral NSW 2576. It has been prepared as a bushfire assessment of Lot 1 DP 619081 for a strata subdivision of existing buildings in the Local Government Area of Wingecarribee Shire Council, NSW.

The land is identified as being within a designated bush fire prone area and as the development application is for subdivision, it is subject to consideration under Section 4.46 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in combination with 100B of the *Rural Fires Act*, and must be submitted to the NSW RFS for a Bushfire Safety Authority.

The land is in the southern portion of Mittagong, north east of Mount Gibraltar and south east of the railway line. The precinct is an established urban residential area with managed gardens around dwellings with large, mature trees, many of them exotic species.

The subject site is overlaid by the mapped buffer from a Category 1 hazard on adjoining lands to the north west and west which also overlays the north west corner of the lot. This mapped hazard are the managed gardens with large mature trees, that characterise this suburb.

The performance criteria and acceptable solutions required as per PBP 2019 have been assessed and the performance criteria and acceptable solutions to be satisfied have been outlined in Section 4 of this report.

Pending compliance with the below conditions, the performance criteria and acceptable solutions outlined in Chapter 5 of PBP 2019 are found to be satisfied for the subdivision.

Construction Standards

- It is recommended that the existing buildings be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.

APZ and Landscaping Recommendations

- It is recommended that the whole site continue to be maintained as an APZ.

Services Recommendations

Water:

- Hydrants are provided in accordance with the requirements of the Local Government Authority or with the relevant clauses of AS 2419.1:2005 – fire hydrant installations System design, installation and commissioning.
- All above ground water service pipes are metal, including and up to any taps.

Electricity:

- Where practicable, electrical transmission lines are underground.

Gas:

- Gas installation and maintenance to be in accordance with Australian Standard AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
- Above ground gas service pipes are metal, including and up to any outlets.

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1 Introduction

This Bush Fire Assessment Report has been compiled regarding the proposed strata subdivision of existing buildings at Lot 1 DP 619081 known as 39-41 Tyndall Street Mittagong, as part of a development application to be submitted to Wingecarribee Shire Council.

As of this report date, *Planning for Bushfire Protection 2019 (PBP 2019)* is the legislated document to be complied with. This report has been prepared in accordance with the submission requirements of *Appendix 2 of PBP 2019* and identifies if the proposal can meet the appropriate objectives and performance criteria of Chapter 5 *PBP 2019*.

2 Site Description

2.1 Location

The land is in the southern portion of Mittagong, north east of Mount Gibraltar and south east of the railway line.

Figure 2-1 Street Map of subject land © SIX Maps

2.2 Description

Cadastre of the subject land can be found in Appendix 1 and development plans in Appendix 2.

Size: approximately 1600m^2

Aspect: southerly

Slope: 0-5 degrees downslope from south to north

Existing: Five brick townhouses as two buildings, gardens and carport

Water: Reticulated

Electricity: Above ground

Gas: Unknown

Access: from Tyndall Street

FDI: 100

Figure 2-2 Aerial photo of the subject site © Nearmap

Figure 2-3 Aerial photo of site and precinct © Nearmap

2.3 Zoning

The property is zoned R3 – Medium Density Residential as are the lots to the north, east and west. The land beyond the southern side of Tyndall Street is zoned R2 – Low Density Residential.

Figure 2-4 – Zoning of subject land – ePlanning Spatial Viewer

2.4 Proposal

The proposal is for the strata subdivision of the existing buildings on the site. As such, with regard to bushfire it must comply the performance criteria and acceptable solutions as outlined in *Planning for Bushfire Protection 2019 Chapter 5.*

3 Bushfire Hazard and Risk Assessment

3.1 Bushfire Prone Land

The subject land is partially overlaid by the vegetation buffer from a mapped Category 1 hazard that lies beyond the property boundaries to the north west and west. There is also a mapped hazard overlaying the north west corner of the site however this vegetation has been removed since the creation of this map.

Figure 3-1 Bushfire Prone Land Map © ePlanning Spatial Viewer

3.2 Vegetation

Fig 2-2 and Fig 2-3 above shows the vegetation present on the subject and surrounding lots which are managed gardens with exotic trees. Mapping of the vegetation communities affecting the lot show this site and area as cleared land and the Category 1 hazard is not native vegetation in this locale.

3.2.1 Vegetation on subject lot and nearby land

The vegetation on the property is deemed to be managed land and the mapped hazard beyond the north western and western boundaries of the site, also being managed residential lands.

3.2.2 Vegetation to 140m & Effective slope under hazard to 100m

The vegetation affecting the proposed development site can be outlined as per the table following.

Table 1 – Predominant vegetation; Effective slope measured ***from existing dwelling***

Aspect	Distance to Hazard	Minimum APZ Table A1.12.2	Vegetation up to 140m	Effective Slope under hazard to 100m	BAL for elevation
North	>100m	n/a	Managed Land	0-5° downslope	BAL Low
East	>100m	n/a	Managed Land	Level	BAL Low
South	>100m	n/a	Managed land	Upslope	BAL Low
West	>100m	n/a	Managed Land	Level/upslope	BAL Low

3.2.3 Predominant Vegetation and Closest threat of Bushfire

The closest threat is the mapped forest on the sides of Mount Gibraltar more than 600m to the south west of the site.

3.3 Hazard Assessment

3.3.1 Fire and Ember Attack

The closest hazard is a mapped forest hazard to the south west of the site. Ember attack may be experienced from this hazard.

3.3.2 Fire History

MyRFS shows that the subject land has not been impacted by wildfire. The most recent fire near the subject land was the Green Wattle Creek Fire in 2020 approximately 5km to the north west.

Figure 3-2 Wildfire Map © NSW RFS

3.3.3 Bushfire Attack Level

The BAL's as established in the tables above indicate that the existing dwellings are BAL Low.

3.3.4 Asset Protection Zone – APZ

The subject site is to continue to be maintained as managed land.

3.4 Significant Environmental Features

3.4.1 Heritage

In accordance with the Wingecarribee Shire Council Heritage map, there are no heritage considerations on the subject land.

3.4.2 Aboriginal Heritage

An AHIMS search identified no Aboriginal sites in or near the subject land.

3.4.3 Flora and Fauna

The proposed strata subdivision of existing buildings is occurring on land that is developed and well managed, thus the site is already cleared of native vegetation. Hence, there are no known significant environmental constraints or considerations on the subject land that would preclude the approval of this proposal.

3.5 Overall Assessment

Pending the satisfaction of section 4.2 below, the level of bushfire hazard risk identified in relation to the subject land and the proposed development is not considered to be such that the proposal should be denied due to bushfire considerations.

4 Bushfire Protection Measures

Chapter 5 of The NSW Rural Fire Services' *Planning for Bushfire Protection 2019* (PBP 2019) provides the standards for residential and rural residential subdivisions in bushfire prone areas.

The tables below outline the performance criteria and acceptable solutions specified in Chapter 5 Residential and Rural Residential Subdivisions in PBP 2019 that must be satisfied for this proposal to be approved.

4.1 Asset Protection Zone – APZ

Intent of measures: to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact (5.3.1 PBP 2019)

4.1.1 How PBP 2019 APZ and landscaping requirements are satisfied

Performance Criteria The intent may be achieved where:	**Acceptable Solutions**	**Design Response**
• potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m2 on each proposed lot	• APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI	• The site is to continue to be maintained as managed land.
• 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	• Can comply
• the APZ is provided in perpetuity	• APZs are wholly within the boundaries of the development site	• Can comply
• 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	• Can comply
• landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignition	• Landscaping is in accordance with Appendix 4; and • Fencing is constructed in accordance with section 7.6.	• Can comply

4.2 Access

Intent of measures: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area (5.3.2 PBP 2019).

4.2.1 PBP 2019 (Table 5.3b) – Access (General Requirements)

Performance Criteria The intent may be achieved where:	**Acceptable solutions**	**Design Response**
• firefighting vehicles are provided with safe, all weather access to structures	• 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	• Property access roads are two-wheel drive, all-weather roads; • No new roads are proposed as part of this strata subdivision. • Not applicable to this development.

Performance Criteria The intent may be achieved where:	Acceptable solutions	Design Response
	access in and out of the development;	
	• Traffic management devices are constructed to not prohibit access by emergency services vehicles;	• Can comply
	• 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;	• Can comply
	• All roads are through roads.	• Can comply
	• 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;	• Not applicable to this development
	• Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; and	• Not applicable to this development
	• Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and	• Not applicable to this development.
	• One way only public access roads are no less than 3.5m wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	• Not applicable to this development.
• The capacity of access roads is adequate for firefighting vehicles	• The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.	• Can comply
• 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	• Can comply
	• Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 – *Fire hydrant installations System design, installation and commissioning;* and	• Can comply.
	• There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	• Can comply at infill development if required

4.2.2 PBP 2019 (Table 5.3b) – Access (Perimeter Roads and Non-Perimeter Roads)

Performance Criteria The intent may be achieved where:	**Acceptable solutions**	**Design Response**
• Perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	• Perimeter roads are two-way sealed roads; • Minimum 8m carriageway width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • Are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • Curves of roads have a minimum inner radius of 6m; • The maximum grade road is 15 degrees and average grade of not more than 10 degrees; • The road crossfall does not exceed 3 degrees; and • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	• Not applicable to this development. • Not applicable to this development. • Not applicable to this development. • Can comply • Not applicable to this development. • Not applicable to this development • Not applicable to this development. • Not applicable to this development. • Not applicable to this development.
• Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating	• Minimum 5.5m carriageway width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • Curves of roads have a minimum inner radius of 6m; • The road crossfall does not exceed 3 degrees; and • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided	• Can comply • Can comply • Can comply • Can comply • Can comply • Can comply • Can comply

4.2.3 PBP 2019 (Table 5.3b) – Access (Property Access)

Performance Criteria The intent may be achieved where:	**Acceptable solutions**	**Design Response**
• Fire fighting vehicles can access the dwelling and exit the property safely	• There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting. In circumstances where this cannot occur, the following requirements apply: • Minimum 4m carriageway width; • In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; • Provide a suitable turning area in accordance with Appendix 3; • Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; • The minimum distance between inner and outer curves is 6m; • The crossfall is not more than 10 degrees; • Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • A development comprising more than three dwellings has access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.	• Can comply

4.3 Services – Water, electricity and gas

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building

4.3.1 Services – Water, electricity and gas

Performance Criteria The intent may be achieved where:	Acceptable Solutions	Design Response
Water Supplies • Adequate water supply is provided for firefighting purposes.	• Reticulated water is to be provided to the development where available • A static water supply is provided for non- reticulated developments or where reticulated water supply cannot be guaranteed; and • static water supplies shall comply with Table 5.3d..	• Reticulated water will be provided.
• 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 2419.1-2005; • 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.	• Hydrant located in Oxley Drive and in Tyndall Street. Can comply or meet the requirements of the Local Government Authority.
• Flows and pressures are appropriate	• Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	• Can comply or meet the requirements of the Local Government Authority.
• 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.	• Can comply
Electricity Services • location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings	• Where practicable, electrical transmission lines are underground • Where overhead, electrical transmission lines are proposed as follows: ○ lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; ○ no part of a tree is closer to a power line than the distance set out in accordance with the specifications in issc3 Guidelines for Managing Vegetation Near Power Lines.	• Can comply • Can comply
Gas services • Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• Reticulated gas 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	• Can comply • Can comply

Performance Criteria The intent may be achieved where:	Acceptable Solutions	Design Response
	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.	 • Can comply • Can comply • Can comply

4.4 Recommendations

4.4.1 Construction Standards

- It is recommended that the existing building be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.

4.4.2 APZ and Landscaping Recommendations

- The subject site is to continue to be maintained as managed land.

4.4.3 Services Recommendations

Water:

- Hydrants are provided in accordance with the requirements of the Local Government Authority or with the relevant clauses of AS 2419.1:2005 – *fire hydrant installations System design, installation and commissioning.*
- All above ground water service pipes are metal, including and up to any taps.

Electricity:

- Where practicable, electrical transmission lines are underground.

Gas:

- Gas installation and maintenance to be in accordance with Australian Standard AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
- Above ground gas service pipes are metal, including and up to any outlets.

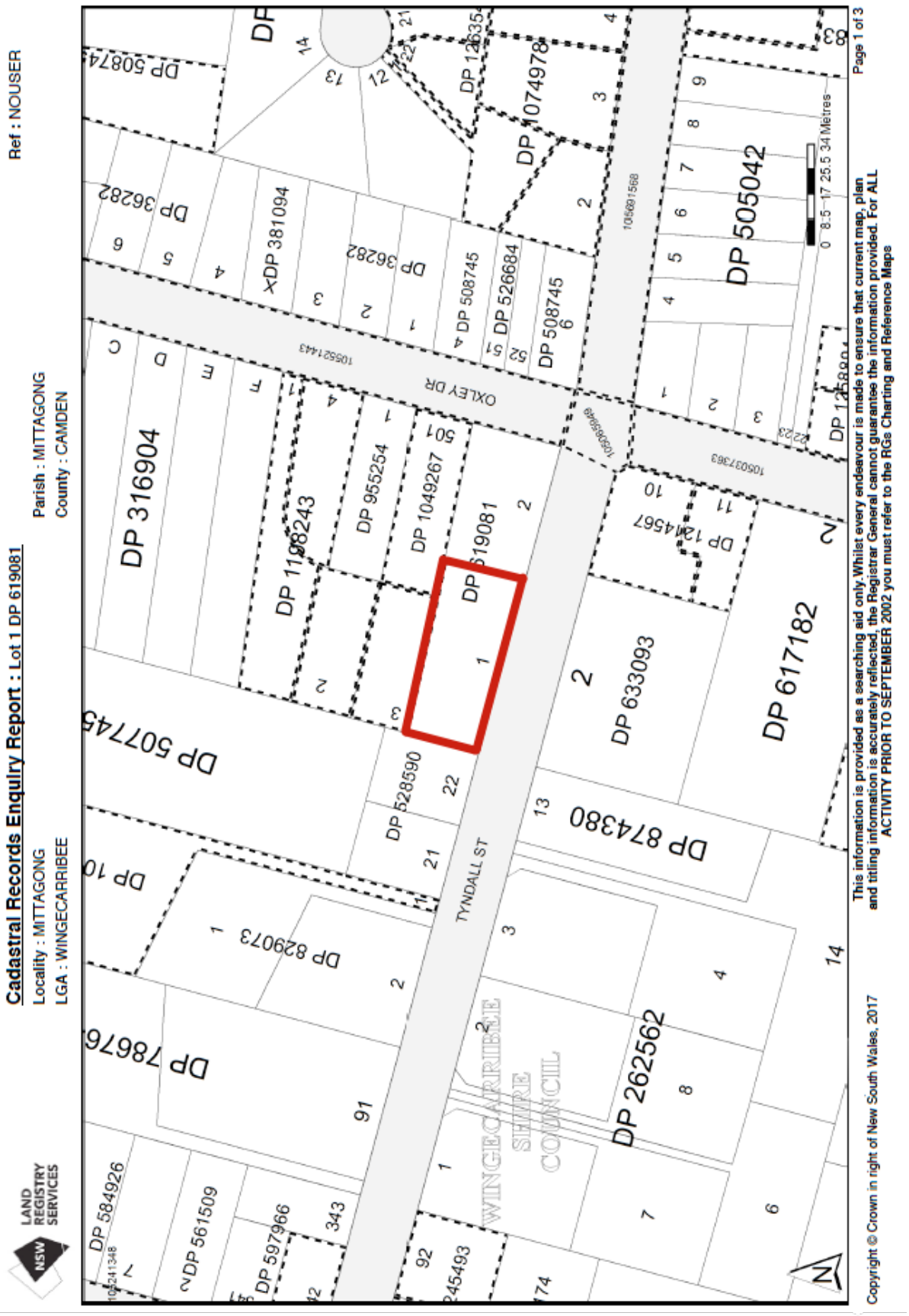
5 Summary of Findings and Recommendations

This report finds that the proposed strata subdivision of existing buildings satisfies the requirements of PBP 2019.

Hence this report does not believe that the proposal should be rejected due to bushfire considerations.

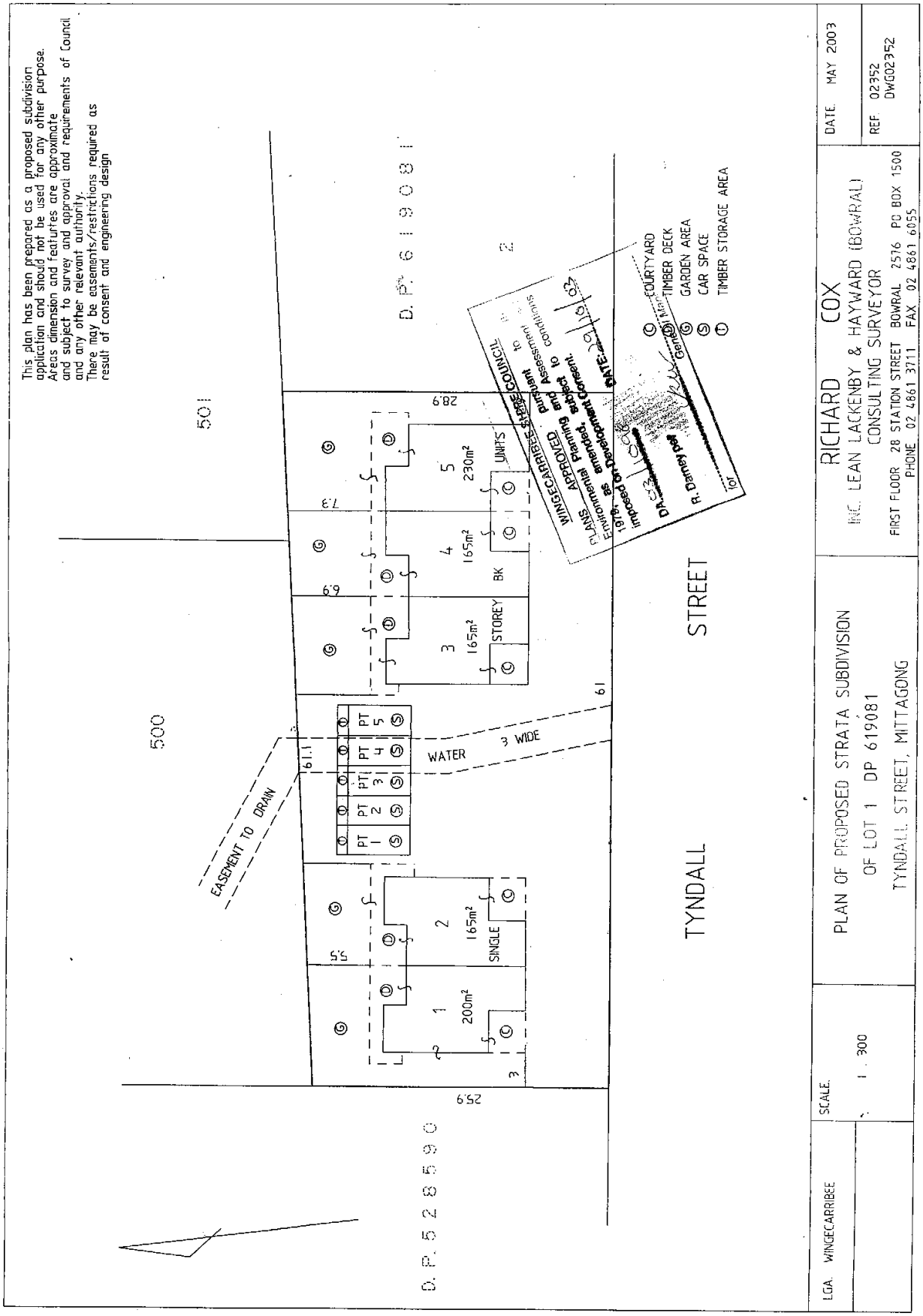
6 Appendices

Appendix 1 Cadastre



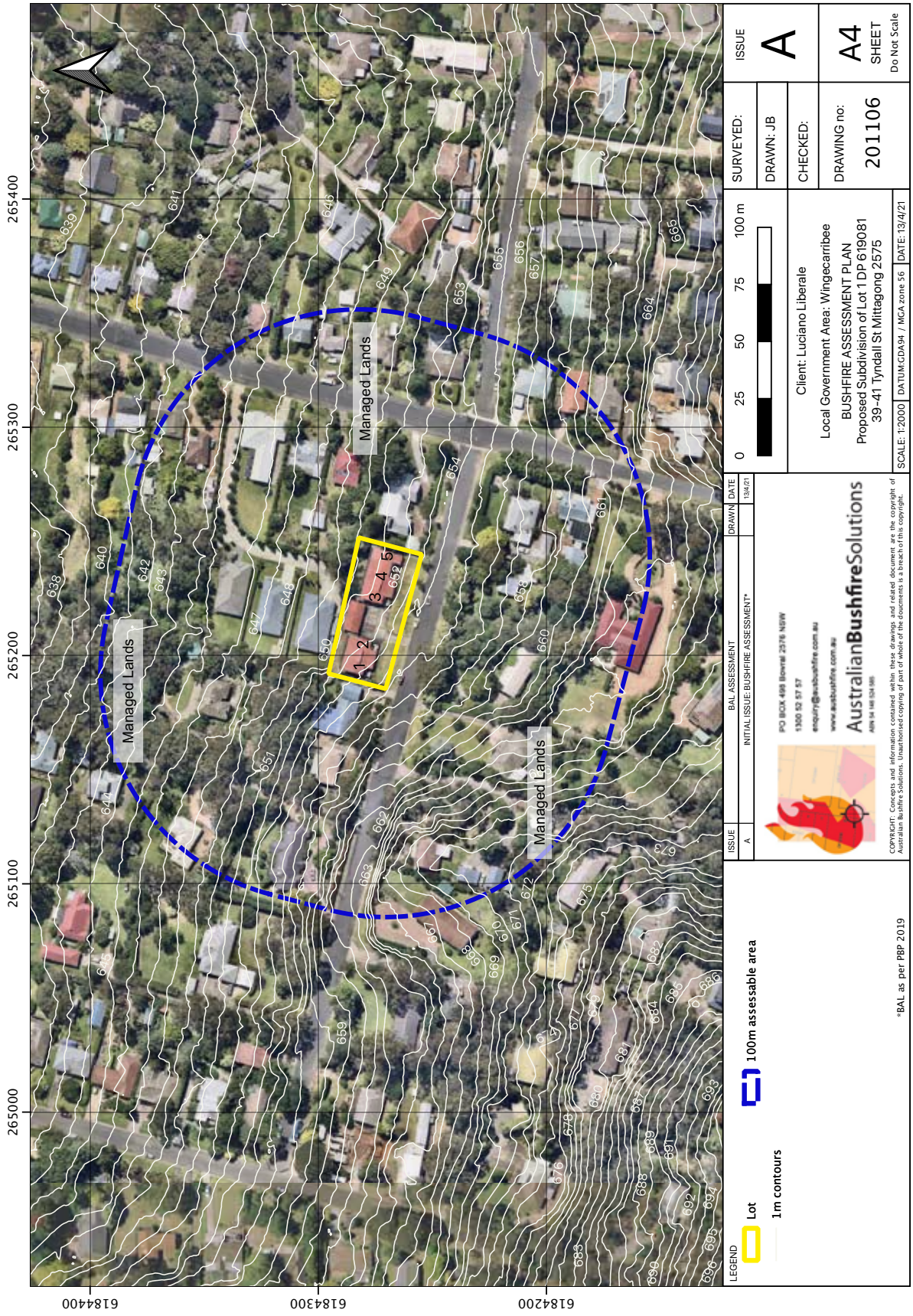
Appendix 2 Development

Strata Subdivision Plan



Appendix 3 Vegetation

Appendix 4 Bushfire Plan



Appendix 5 Site photos

Figure A-1 - Looking west along Tyndall Street with the subject site to the right of picture.

Figure A-2 - The buildings to be strata subdivided showing the managed lands in the area.

Figure A-3 - Looking north across the site to show the large trees beyond the subject site are specimen trees within managed grounds.

Figure A-4 - Looking across and beyond the dwelling adjoining to the west where there are specimen trees within managed grounds.

Appendix 6 Appendix 4 of PBP 2019 – Asset Protection Zone Requirements

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

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

Shrubs

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

Grass

- 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.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

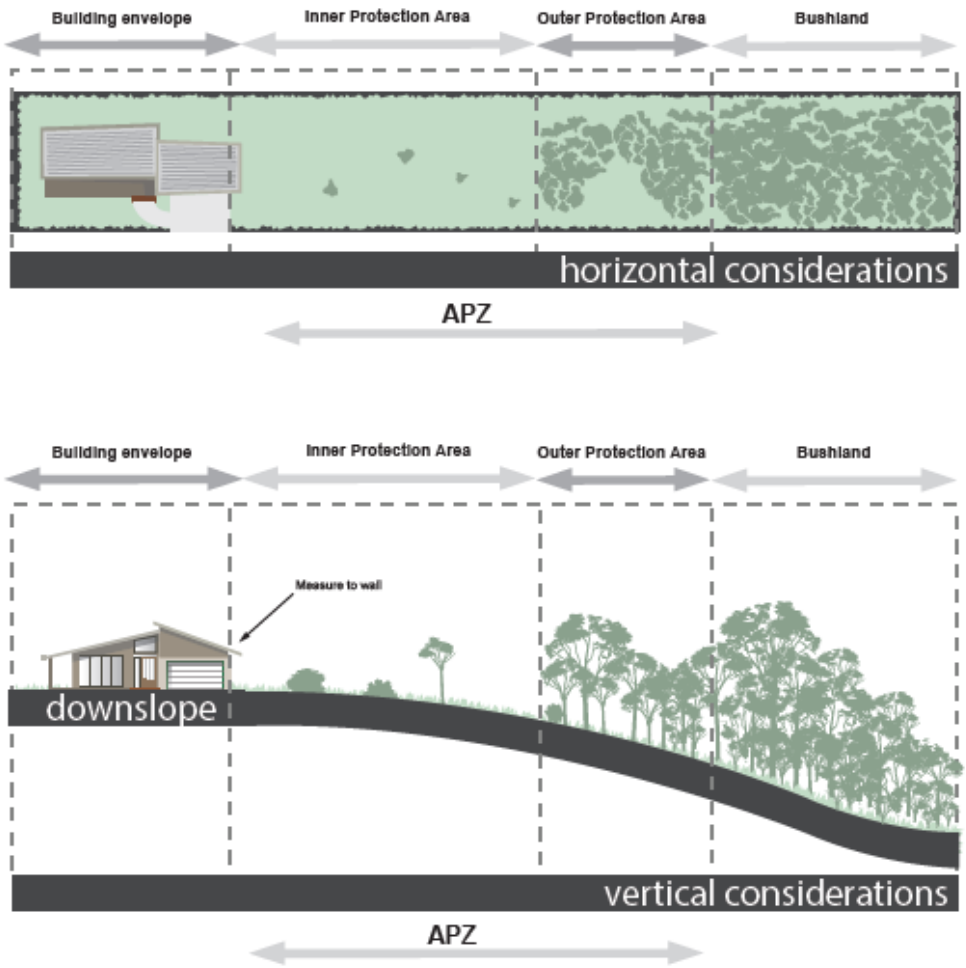
Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

Figure A4.1

Typical Inner and Outer Protection Areas.



Appendix 7 AHIMS

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