BUSHFIRE HAZARD ASSESSMENT

FOR

SUBDIVISION APPLICATION

OF

COASTAL GROVE
1 SURVEY STREET LENNOX HEAD NSW 2478

FOR

DM and RD DOSSOR

13 July 2006
Version A

Prepared by:

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PREFACE

Readers of this report must be aware that the bushfire mitigation recommendations described in this report will not completely remove the risk of bushfire impacting the development site. Recommendations contained herein are designed to improve the bushfire related issues for the existing development. With regard to the application the implementation of recommendations in their entirety, together with the diligent maintenance of Asset Protection Zones, will provide for a reduction of the bushfire threat and the associated risk.

This report caters specifically for the requirements of this project and the Client. No warranty is intended or implied, or responsibility undertaken by Barry Eadie Consulting Pty Ltd for its use on any other project or by any third party.

This report does not include an environmental assessment, Aboriginal heritage assessment or identify endangered species in the area.

1 INTRODUCTION

1.1 Report Purpose

This report assesses the capability of the existing site to be subdivided into approximately 45 residential lots and associated open space and a riparian corridor. The report will form part of the supporting documentation for a Project Application to be submitted to the consent Authority. A Bushfire Hazard Assessment has been undertaken to determine the necessary requirements for the development in accordance with:

- NSW Rural Fire Service, Planning NSW, ***Planning for Bushfire Protection***, 2001; and
- AS 3959-1999: ***Construction of Buildings in Bush Fire Prone Areas.***

Barry Eadie Consulting Pty Ltd has been engaged by DM and RD Dossor to prepare the Bushfire Hazard Assessment report, to be used in support of the Development Application.

2 BUSHFIRE LEGISLATION IN NSW

The ***Environmental Planning and Assessment Act 1979*** and the ***Rural Fires Act 1997*** were amended recently via the ***Rural Fires and Environmental Assessment Legislation Amendment Act 2002.***

The amendments to the legislation are not retrospective and consequently will not usually apply to development applications which were made, but not necessarily finally determined, before 1 August 2002.

With regard to the ***Environmental Planning and Assessment Act 1979***, the amendments:

a) Require local government councils to record on maps land identified by the Commissioner of the NSW Rural Fire Service as bushfire prone land; and

b) Prevent development consent being granted for the carrying out of development for certain purposes on bushfire prone land unless the consent authority is satisfied that the development conforms to certain documented bushfire protection specifications and requirements **(*Planning for Bushfire Protection*** and ***AS 3959 – Construction of Buildings in Bushfire-Prone Areas*)** or has consulted with the Commissioner;

Planning for Bushfire Protection, defines bushfire prone areas as an area that can support a bushfire or is likely to be subject to bushfire attack. In general, a bushfire prone area is an area containing a high, medium or low bushfire hazard, or any area within 100 m of a high or medium bushfire hazard, or within 30 m of a low bushfire hazard. Bushfire hazard areas do not include existing urban areas or water bodies (other than wetland vegetation), and are identified by bushfire hazard mapping produced under an approved Bushfire Risk Management Plan, or other such map certified by the Commissioner of the NSW Rural Fire Service for this purpose.

3 SITE ASSESSMENT

NAME:	DM and RD Dossor
ADDRESS:	C/- Sake Development Pty Ltd, Suite 11, 340 Darling Street, Balmain NSW 2041
SITE ADDRESS:	Lot 2, DP 622475 1 Survey Street, Lennox Head. NSW
COUNCIL:	Ballina Shire Council
TYPE of AREA:	Zone 2(a) – Living Area under Ballina Environmental Plan 1987 with pockets of land with the following zonings: 1(d) Rural (Unban Investigation) 6(a) Open Space 7(d) Environmental (Scenic/Escarpment) 7(l) Environmental Protection (Habitat).
TYPE of DEVELOPMENT:	Subdivision for approximately 45 lots.

Barry Eadie conducted inspections of the site at 1 Survey Street, Lennox Head and the surrounding area on the 19 June 2006. The following assessment has been undertaken in accordance with the requirements of ***Planning for Bushfire Protection***, 2001.

3.1 Location

The site is located at the end of Blue Seas Parade and runs south towards Seamist Place (see Appendix A). The site comprises areas of pasture land which once developed will comprise the bulk of the proposed residential lots, there are also areas classified as Environmental Protection and Open Space.

The current Council Bushfire Prone Land Map shows the only area of the site impacted by the Map is the littoral rainforest (Environmental Protection Area) in the southern portion of the site which is the only area that constitutes a bushfire Hazard.

For the sake of clarity and this report the proposed subdivision will be addressed in four parts, area A'' (lots 12-45) the larger eastern area and area 'B' (lots 1-10) the smaller area to the North-west area 'C' open space along the western boundary of the site and area 'D' the Environmental Protection area in the southern portion of the site.

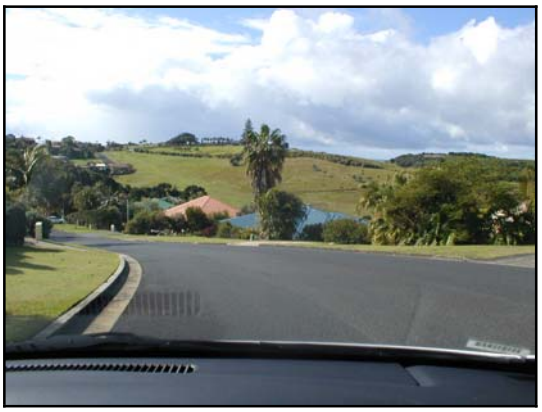
Details of the proposed subdivision and relationship to Survey Street are shown in Appendix A

3.2 Vegetation

The vegetation has been assessed over a distance of 140 m from the existing bush vegetation both on and off site in all directions in accordance with Figure A2.2 of ***Planning for Bushfire Protection*** (refer Appendix B).

In relation to area A there is no vegetation to the North which boarders the street (see photo1 Eastern end of site), to the South is the area of littoral rainforest (Area 'D' Environmental Protection Area) which is to be maintained and extends along the permanent watercourse which runs North to South between areas 'A' and 'B' then generally along the western boundary and into the southern portion of the site. (See photo 2 view from Seamist Place of subject site)

1. Eastern end of site.



2. View from Seamist Place of subject site.

To the East of area 'A' is the neighbouring managed property separated from the subject site by a Crown Land road reserve (20m wide) with areas of vegetation approximately 3-4m in width (see photo 3 strip of vegetation on Eastern boundary). West is area 'C' Open Space.(See photo 4 view from South-west to West & photo 5 view from South-west to North-west)

3. Strip of vegetation on Eastern boundary.

4. View from South-west to West.

5. View from South-west to North-west.

For area 'B' to the North is existing residential development, south is 10 m wide strip of vegetation which connects into area 'C' Open Space. East is also area 'C' Open Space, whilst West is existing residential development.

3.3 Slope

Based on the site inspection, the slope of the land over a distance of 100 m from the indicative building lines in all directions has been assessed. In accordance with ***Planning for Bushfire Protection***, the slope has been assessed based on the gradient that will most significantly influence the fire behaviour of the site.

The site is undulating with all slopes towards the watercourse from the East, West and North. The slope that impacts upon bushfire development and behaviour is flat as the only vegetation that constitutes a bushfire hazard is area 'D' the littoral rainforest (Environmental Protection) to the South.

3.4 Asset Protection Zone

The Asset Protection Zone (APZ) acts as a buffer zone between the development and the hazard. The primary purpose of an APZ is to ensure that a progressive reduction of bushfire fuels occurs between the bushfire hazard and any habitable structures. The APZ consists of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

Tables A2.2 to A2.4, within ***Planning for Bushfire Protection***, specify the minimum APZ required in bushfire-prone areas (refer to Appendix C) with Table A2.4 being relevant in this instance.

Based upon the foregoing assessment of vegetation and slopes the following APZ's would be required from Table A2.4.

AREA 'A' Lots 12-45

Development Aspect	Hazard/ Vegetation within 140m of Development	Predominant Vegetation Class (Fig A2.2 and Table A2.1)	Average Slope of Land	Recommended Width of Asset Protection Zone (IPA + OPA) (table A2.2 and A2.4)	Proposed Width of Asset Protection Zone (IPA + OPA)
North area 'A' Lots 12 and 13.	Public road then residential.	None	N/A	Nil	Nil
South area 'A' Lots 33 and 34.	Littoral rainforest within the Environmental Protection Area	Group 3	5-0^0 Upslope	APZ 20m (20m IPA + 0mOPA)	APZ 20m (20m IPA + 0mOPA)
East area 'A' Lots 13-15 and 34-45	3-4m strip of small scrub then managed grassland	Group3	5-0^0 Upslope	Nil due to the small area and narrow width.	Nil
West area 'A' Lots 12, 14 and 15	Public road then residential	None	N/A	Nil	Nil
West area 'A' Lots 16-33	Road then Open Space	None	5-0^0 Upslope	Nil (riparian landscape)	Nil

AREA 'B' Lots 1-10

Development Aspect	Hazard/ Vegetation within 140m of Development	Predominant Vegetation Class (Fig A2.2 and Table A2.1)	Average Slope of Land	Recommended Width of Asset Protection Zone (IPA + OPA) (table A2.2 and A2.4)	Proposed Width of Asset Protection Zone (IPA + OPA)
North area 'B' Lots 7-10	Existing residential development	None	N/A	Nil	Nil
South Area 'B' Lots 1-10	Subdivision road then Open Space	None	5-0^0 Upslope	Nil (riparian landscape)	Nil
East Area 'B' Lots 1-6	Subdivision road then Open Space	None	5-0^0 Upslope	Nil (riparian landscape)	Nil
East Area 'B' Lot 10	Open Space	Managed open grass, trees for shade and seating	N/A	Nil	Nil
West Area 'B' Lots 1-8	Existing residential development	None	N/A	Nil	Nil

Refer to Appendix E for a description of both Inner and Outer Protection Areas, as per ***'Planning for Bushfire Protection' (2001).***

3.5 Level of Construction

Tables A3.1 and A3.3 of ***Planning for Bushfire Protection*** allow the determination of the relevant level of construction in accordance with AS 3959-1999: ***Construction of Buildings in Bushfire-Prone Areas.*** (Refer to Appendix D)

Based upon Table A3.3 and the assessment of this report taking into account the vegetation type, slope and available APZ this development's category of Bushfire Attack is Low. As such there are no construction requirements for the proposed dwellings.

3.6 Fire Fighting Personnel Access

3.6.1 Public Road Access

Access is provided to the Site via sealed public road, Survey Street which forms part of the public road network in the area and capable of supporting fully loaded fire fighting vehicles.

3.6.2 Property Access

Property Access will be from Survey Street and Blue Seas Parade. This access road will comply with the requirements of Section 4.3.2 Property Access Roads of ***Planning for Bushfire Protection 2001.*** Even though there is only one proposed access to the site this is considered satisfactory in the circumstance due to the nature of the vegetation. The access and egress provisions include a loop road serving Lots 12-45 whilst a dead end road will serve Lots 1-10. Both roads are located between the proposed residential lots and any vegetation providing suitable access for the Fire Service.

Additionally access is available to Area 'D' (Environmental Protection Area) the watercourse littoral rainforest from Seamist Place from the South. Pedestrian access is available with gated access for Fire Services access.(See photo 6 view from end of Seamist Place).(Refer to Appendix F)

6. View from end of Seamist Place.

3.7 Electricity Supply

It is preferable that transmission lines providing power to the proposed development should be installed underground. Satisfactory provisions are available, however, if this is not possible.

3.8 Gas

Reticulated or bottled gas shall be installed and maintained in accordance with AS/NZS 1596-2002: ***Storage and Handling of LP Gas*** and the requirements of the relevant authorities. If gas cylinders are to be kept close to buildings, the release valve must be directed away from the building and away from any hazardous materials such as firewood, so that it does not act as a catalyst to combustion.

3.9 Water Supply

Town reticulated water supply is available to the proposed development, therefore a supplementary form of water supply will not be necessary for fire fighting purposes. Hydrants will be provided on site in accordance with AS 2419.

4 RECOMMENDATIONS

Based on Barry Eadie's site inspection and assessment, the following recommendations would be required for future development of dwellings on the lots:

(a) APZ's be maintained in accordance with Section 3.4 of this report:

(b) If any trees are to be located within the envisaged APZs, this is considered acceptable, providing the following conditions are met:

  (i) Vegetation is not to touch or overhang dwellings (canopy vegetation must not be within 5 metres of any building/dwelling);

  (ii) Vegetation is not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and

  (iii) Vegetation is located far enough away from dwellings so that it will not ignite the dwelling by direct flame contact or radiant heat emission.

(c) Woodpiles, combustible material storage sheds, large areas/quantities of garden mulch and stacked flammable building materials should not be located within IPA of dwellings;

(d) There are no construction requirements for the proposed dwellings.

(e) Reticulated or bottled gas shall be installed and maintained in accordance with AS/NZS 1596-2002: ***Storage and Handling of LP Gas*** and the requirements of the relevant authorities.

5 CONCLUSIONS

Barry Eadie has conducted a site inspection and assessment of the existing site. The assessment has been undertaken in accordance with ***Planning for Bushfire Protection*** and AS 3959-1999: ***Construction of Buildings in Bush Fire Prone Areas.***

Provided the recommendations stated above are implemented in full, Barry Eadie Consulting Pty Ltd is of the opinion that the proposed development achieves the intent of the relevant legislation and in particular the requirements as set out in ***'Planning for Bushfire Protection' (2001).***

6 REPORT BASIS INFORMATION

The report is based on the following:

(i) Site inspections carried out on 19 June 2006 by Barry Eadie;

(ii) Site Plan

7 REFERENCES

- NSW Rural Fire Service, Planning NSW, 2001, ***Planning for Bushfire Protection.***
- AS 3959-1999: ***Construction of Buildings in Bush Fire Prone Areas.***

APPENDIX A – PROPOSED DEVELOPMENT PLAN


DR
PINNACLE
ROW
PINNACLE
THE
ROW
HENDERSON
PL
SEAGRASS
PL
BLUE
SEAS
LN
ST
PDE
SURVEY
ST
SURVEY
RD
CREEK
NORTH
DR
AMBER
JANE
PL
DR
AMBER
SEAVIEW
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PL
VICTOR
PL
LOEDNA
SEABREEZE
SEAMIST
PL
0
50
100
metres
Approx Scale 1 : 3000
GDA
N
W
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S
LOCALITY PLAN - Lot 2 DP 622475 LENNOX HEAD
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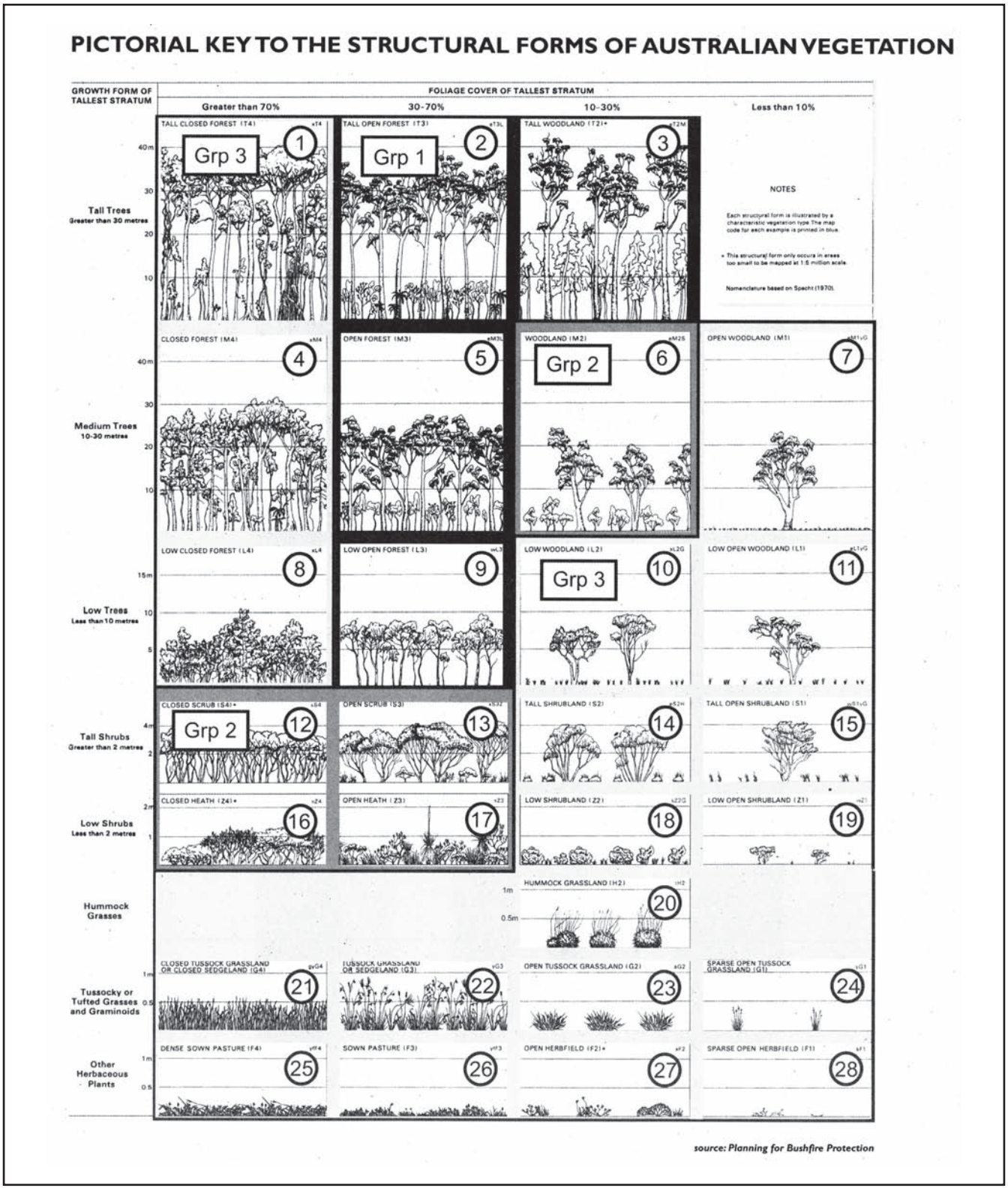
APPENDIX B – VEGETATION ASSESSMENT

Figure A2.2, Planning for Bushfire Protection:



APPENDIX C – BUSHFIRE PROTECTION ASSESSMENT (TABLES A2.2 - A3.4)

Table A2.2, *Planning for Bushfire Protection* - Minimum Specifications for Asset Protection Zones (APZ) for Residential Purposes in Bushfire-prone Areas:

Forests (Group 1 – see Figure A2.2)				
Slope	**Direction of Slope**	**Asset Protection Zone (m)**		
		Total (IPA + OPA)	**Inner Protection Area (IPA)**	**Outer Protection Area (OPA)**
> 5°	Upslope	20	20	0
5 – 0°		30	20	10
> 0 - 5°	Downslope	40	30	10
> 5 - 10°		50	40	10
>10 - 15°		60	50	10
>15 - 18°		70	60	10
Woodlands, heaths, open scrub (Group 2 – see Figure A2.2)				
Slope	**Direction of Slope**	**Asset Protection Zone (m)**		
		Total (IPA + OPA)	**Inner Protection Area (IPA)**	**Outer Protection Area (OPA)**
> 5°	Upslope	20	20	0
5 - 0°		30	20	10
> 0 - 5°	Downslope	35	25	10
> 5 - 10°		40	30	10
>10 - 15°		50	40	10
>15 - 18°		60	50	10

Table A2.3, ***Planning for Bushfire Protection*** – Minimum Specifications for Asset Protection Zones (APZ) for **Special Protection Developments** in Bushfire-prone Areas:

Forests (Group 1 – see Figure A2.2)				
Slope	**Direction of Slope**	**Asset Protection Zone (m)**		
		Total (IPA + OPA)	**Inner Protection Area (IPA)**	**Outer Protection Area (OPA)**
> 5°	Upslope	60	50	10
5 - 0°		75	60	15
> 0 - 5°	Downslope	80	65	15
> 5 - 10°		90	75	15
>10 - 15°		100	85	15
>15 - 18°		100	85	15
Woodlands, heaths, open scrub (Group 2 – see Figure A2.2)				
Slope	**Direction of Slope**	**Asset Protection Zone (m)**		
		Total (IPA + OPA)	**Inner Protection Area (IPA)**	**Outer Protection Area (OPA)**
> 5°	Upslope	30	20	10
5 - 0°		40	25	15
> 0 - 5°	Downslope	50	35	15
> 5 - 10°		60	45	15
>10 - 15°		80	65	15
>15 - 18°		100	85	15

Table A2.4, *Planning for Bushfire Protection* – Minimum Specifications for Asset Protection Zones (APZ) for Residential Purposes and Special Protection Development in Bushfire-prone Areas by Vegetation Group 3:

Rainforests, grasslands, open woodlands, mallee (Group 3 – see Figure A2.1)
Minimum separation distance of 20 m (managed understory or grasses) required regardless of construction level for all slopes. Fire trail recommended.

APPENDIX D – BUSHFIRE ATTACK ASSESSMENT (TABLES A3.1 AND A3.3)

Table A3.1, *Planning for Bushfire Protection* – Categories Of Bushfire Attack

Category	Description
Low	Minimal attack from radiant heat and flame due to the distance of the site from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements.
Medium	Attack by burning debris is significant with radiant heat and flame attack insufficient to threaten building elements (unscreened glass). Specific construction requirements are therefore warranted. (AS 3959-1999, Level 1 construction applicable)
High	Attack by burning debris is significant with radiant heat levels and flame threatening some building elements (screened glass). Specific construction requirements are therefore warranted. (AS 3959-1999, Level 2 construction applicable)
Extreme	Attack by burning debris is significant and radiant heat levels and flame could threaten building integrity. Specific construction requirements are warranted. (AS 3959-1999, Level 3 construction applicable)
Flame Zone	Flames and radiant heat levels likely to significantly threaten building integrity and result in significant risk to residents who will not be adequately protected. (Beyond scope of AS 3959-1999)

Table A3.3, *Planning for Bushfire Protection* – Determination of Category Of Bushfire Attack For A Site

Distance from vegetation	**< 20 m**	**≥ 20 m to ≤ 30 m**			**> 30 m to < 50 m**			**> 50 m to < 80 m**			**> 80 m to < 100 m**		
Slope	All slopes	> 15°	> 5° to ≤ 15°	0 to 5°	> 15°	> 5° to ≤ 15°	0 to 5°	> 15°	> 5° to ≤ 15°	0 to 5°	> 15°	> 5° to ≤ 15°	0 to 5°
Vegetation	**Category of Bushfire Attack**												
Forest	FZ	FZ	FZ	Ext	FZ	Ext	High	Ext	Ext	Med	Ext	High	Low
Woodland	FZ	FZ	Ext	Med	Ext	High	Low	Ext	Low	Low	Med	Low	Low
Shrub/Heath	FZ	FZ	FZ	Ext	FZ	Ext	High	Ext	High	Med	High	High	Low
Mallee/Mulga	FZ	Med	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Rainforest	FZ	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Grassland	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Non-vegetated	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

APPENDIX E – COMPONENTS OF AN ASSET PROTECTION ZONE

Section 4.2.2, *Planning for Bushfire Protection:*

OUTER PROTECTION AREA

Location

The OPA is located adjacent to the hazard. Originally the OPA would have been part of the bushfire hazard but has become an area where the fuel loadings are reduced.

Purpose

The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricting the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Depth

The depth of the OPA is largely dependent on the type of land use and vulnerability of the dwelling or persons affected.

Fuel Loadings

Within the OPA, any trees and shrubs should be maintained in such a manner that the vegetation is not continuous.

Fine fuel loadings within the OPA should be kept to a level where the fire intensity expected will not impact on adjacent developments. In the absence of any policy to the contrary, 8 tonnes per hectare of fuel is commonly used.

In grasslands, fuel height should be maintained below 10 cm.

INNER PROTECTION AREA

Location

The Inner Protection Area extends from the edge of the Outer Protection Area to the development.

Purpose

The IPA ensures that the presence of fuels, which could become involved in a fire, are minimised close to a development. Therefore the impact of direct flame contact and radiant heat on the development is minimised.

Depth

The depth of the IPA is dependent upon the slope of the land. The greater the slope, the greater the intensity of any approaching fire and hence the greater the depth required for the IPA.

Fuel Loadings

It is more practical to determine the specifications of the IPA in terms of performance than in terms of a minimum fuel loading.

The performance of the IPA must be such that:

(a) there is minimal fine fuel at ground level which could be set alight by a bushfire; and

(b) any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

(a) do not touch or overhang the building;

(b) are well spread out and do not form a continuous canopy;

(c) are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and

(d) are located far enough away from the house so that they will not ignite the house by direct flame contact or radiant heat emissions.

Woodpiles, wooden sheds, combustible material storage areas, large areas/quantities or garden mulch, stacked flammable building materials etc should not be permitted in the IPA.

APPENDIX F – PROPERTY ACCESS ROADS

4.3.2 Property Access Roads

a) Description

- Provide access to individual dwellings or groups of dwellings on battleaxe blocks or in low density developments. They should be joined directly to the through road system. These roads are built on private property.

b) Design Criteria

- A minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes and long grass.
- The road should have a passing bay about every 200m where possible, which should be 20m long by 3m wide, making a minimum trafficable width of 7m at the passing bay.
- The capacity of road surfaces and bridges should be sufficient to carry fully loaded firefighting vehicles (approximately 28 tonnes or 9 tonnes per axle).
- A minimum vertical clearance of 6m to any overhanging obstructions, including tree branches.
- Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape.
- The minimum distance between inner and outer curves should be 6m.
- Maximum grades should not exceed 150 and preferably not more than 100.
- Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle.
- Dwellings not sited within 200m of the road system should have an alternative access road system; and
- Roads should be clearly sign-posted. Bridges should clearly indicate load rating.