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40 Ruskin Rowe, Avalon NSW, 2107

Bushfire Risk Assessment

In relation to a proposed development at:

No 138 Roscrea Drive, Mulgoa, NSW


This assessment has been prepared and certified by: Matthew Toghil. BPAD certified practitioner FPAA Accreditation No: BPAD31642 Report No: 138Ros-01 Date: 15/11/2016	
Can this proposal comply with AS3959-2009 & addendum to Appendix 3 of PBP?	<u>YES</u>
What is the recommended level of compliance with AS3959, 2009?	<u>BAL-19</u>
Does this development comply with the requirements of PBP?	<u>YES</u>
Does this development comply with the Aims and Objectives of PBP?	<u>YES</u>
Plans provided by:	Adenbrook Homes Job No: A0008 Dated: 22/8/2016

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Executive Summary

The purpose of the report is to determine the category of bushfire attack and subsequent construction standard for the proposed new class 1a dwelling at No 138 Roscrea Drive, Mulgoa, NSW.

The site had been identified as 'bush fire prone land' for the purpose of Section 146 of the *Environmental Planning and Assessment Act 1979* and the Legislative requirements for building on bush fire prone lands are applicable.

The proposed development is in infill development as defined within Chapter 4.3.5 of *Planning for Bushfire Protection 2006* and this report has been prepared in accordance with the requirements of Section 79BA of the Environment Planning and Assessment Act.

This assessment includes an analysis of the hazard, threat and subsequent risk of the development proposal and provides recommendations that satisfy the Objective and Performance requirements of the Building Code of Australia, Planning for Bushfire Protection 2006 [PBP] and Australian Standard AS3959, 2009.

Following a site assessment it was determined the distance of the development from the closest hazard would keep the Bushfire Attack Level (BAL) to BAL-19, in accordance with the methodology described in PBP. The development also meets performance criteria as set out in chapter 4 of PBP in relation to APZ's, siting and design, construction standards, access and egress requirements, water and utility services and landscaping.

The site was inspected 14/11/2016.

1. Description of the subject property

Property address: Lot No 501 DP 1176385, No 138 Roscrea Dr, Mulgoa.

Local Government Area: Penrith

The development site is a rural block with access off Roscrea Drive. The following sections 4-8 describe in detail the vegetation, slope, access and egress, availability of water supplies and environmental considerations for the site.

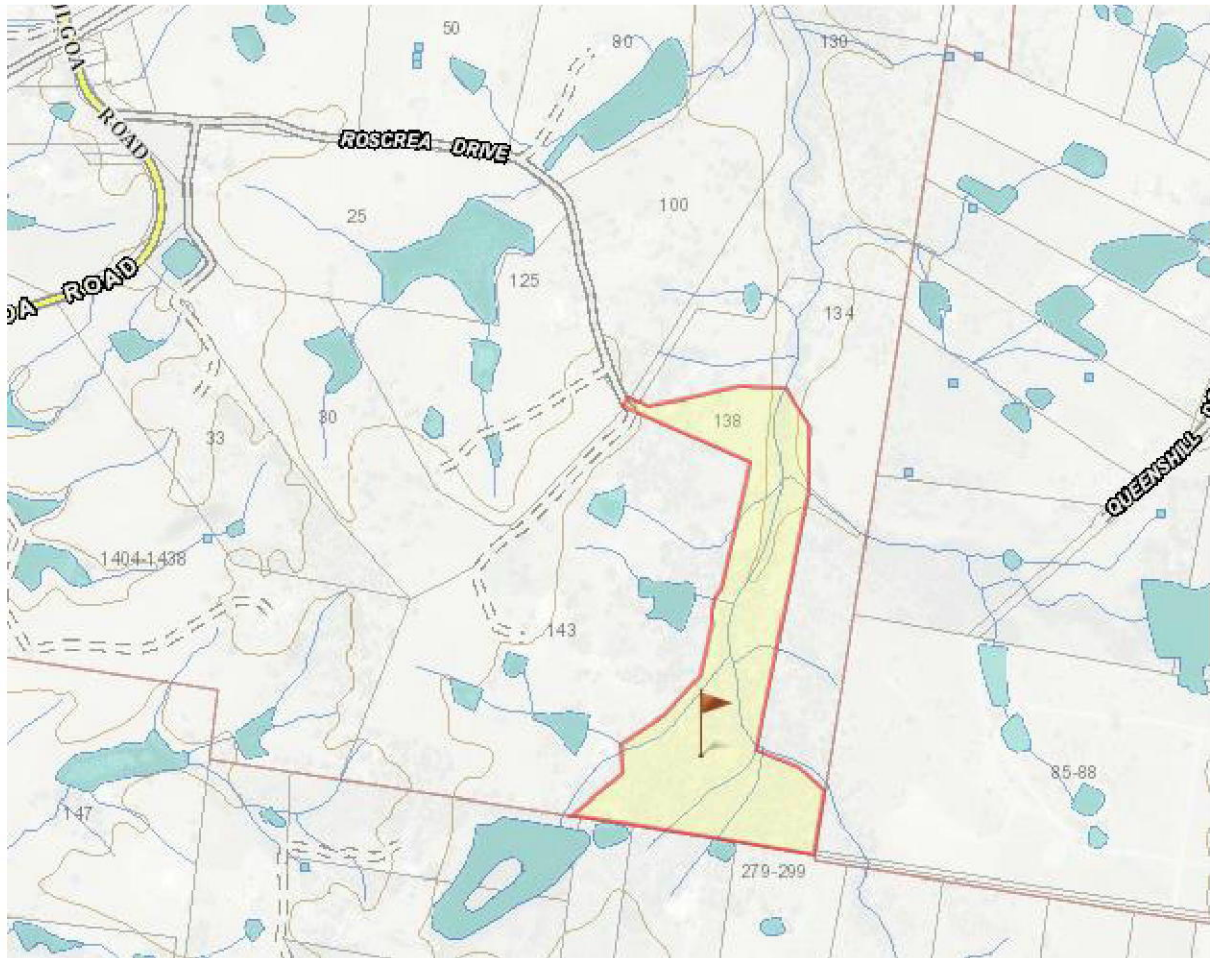


Figure 1: Location of the subject site

2. Development Proposal and Building Classification

The development proposal is for the construction of a new class 1a dwelling.

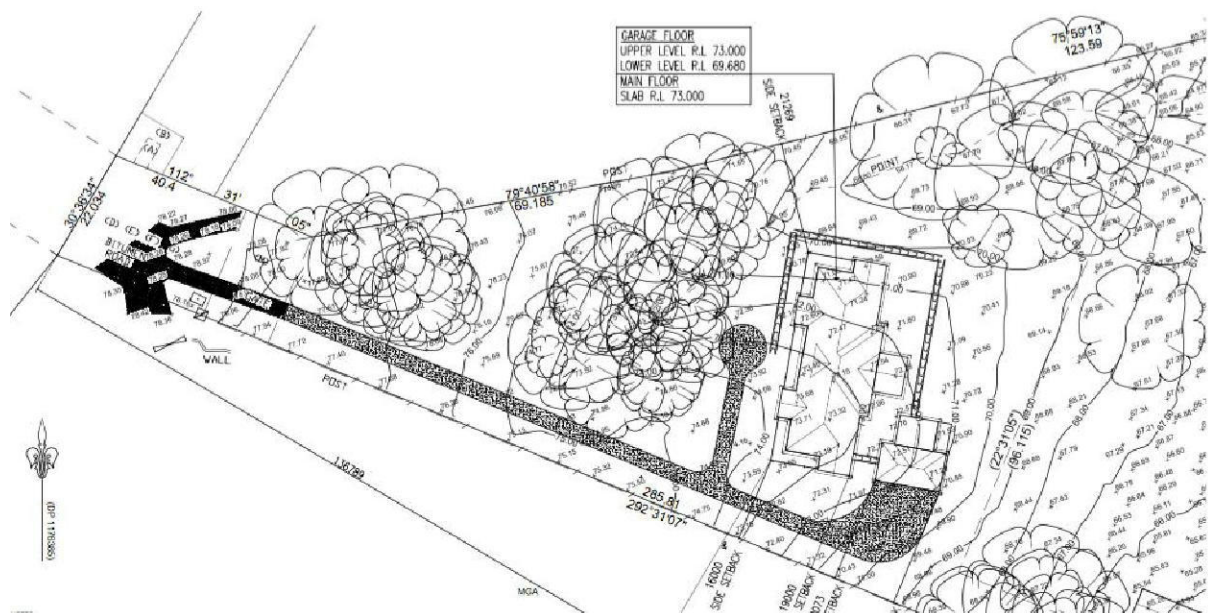


Figure 2: Site plan showing location of the proposed new dwelling.

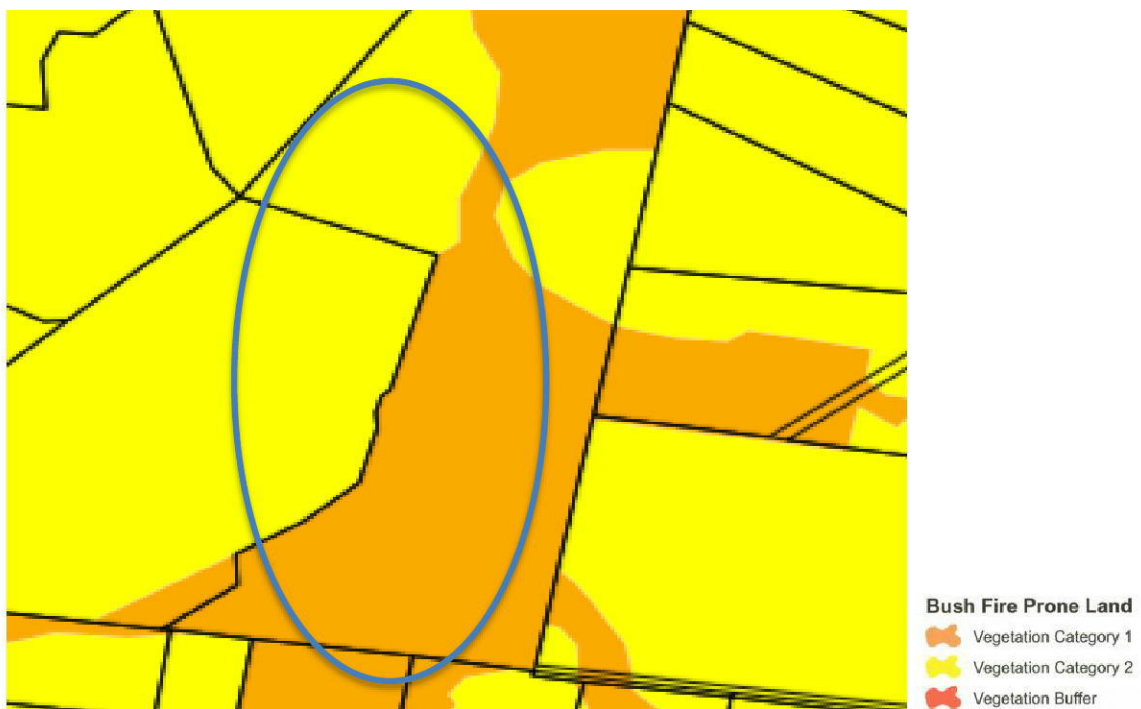


Figure 3: Penrith Council's bushfire prone land map showing the location of the subject site.

3. Classification of the Vegetation on and surrounding the site

The site is located within an existing rural subdivision. With reference to Penrith Council's bushfire prone land map, the entire site has been identified as bushfire prone land with both Category 1 and Category 2 vegetation present. The vegetation surrounding the proposed new dwelling has been identified as Category two vegetation, with a mixture of open grassland and remnant Woodland.



Figure 4: Aerial photo.

North: On the adjoining block, 21.269m from the proposed new dwelling there is an area of vegetation that is considered a threat for bushfire attack to the site. With reference to PBP and the bushfire prone land map for the area the classification of vegetation for this hazard is Category 2 and will be assessed as a Remnant.

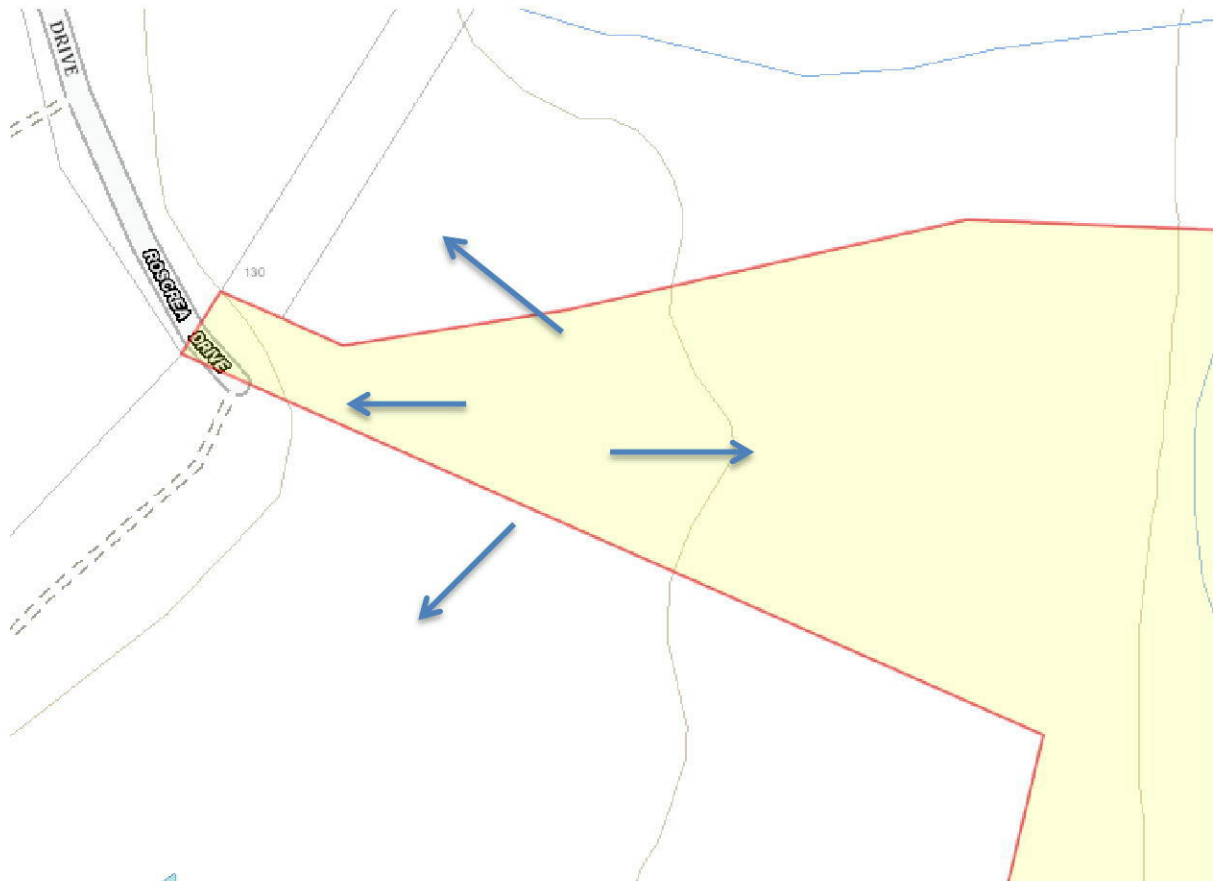
East: To the east of the new dwelling is a large area of open grassland. Recommendations will be made for an Asset Protection Zone to be established and maintained in this direction.

South: On the adjoining block, 16m from the proposed new dwelling there is an area of vegetation that is considered a threat for bushfire attack to the site. With reference to PBP and the bushfire prone land map for the area the classification of vegetation for this hazard is Category 2 and will be assessed as a Remnant.

West: To the west of the new dwelling there is a small area of Remnant Woodland. Recommendations will be made for an Asset Protection Zone to be established and maintained in this direction.

4. Assessment of effective slope

Direction	Hazard type	Effective Slope
North	Remnant Woodland	Upslope
East	Grassland	Downslope >0-5 degrees
South	Remnant Woodland	Upslope
West	Remnant Woodland	Upslope



Legend:



Figure 6: Contour map.

5. Access and Egress

The site has direct access to Roscrea Drive. Recommendations for internal access roads will be made in accordance with the requirements of Chapter 4.1.3 of *Planning for Bushfire Protection 2006*

6. Adequacy of water supply

The site is not serviced by a reticulated water supply. Water supply recommendations will be made in accordance with Table 4.2 of *Planning for Bushfire Protection 2006*.

7. Features that may mitigate the impact of a high intensity bushfire

There are no significant features on or adjoining the site that may mitigate the impact of a high intensity bushfire on the proposed development.

8. Environmental impact of any proposed bushfire protection measures.

The scope of this assessment has not been to provide an environmental assessment, however, the bushfire protection measures that are proposed will have no adverse environmental effects. All protection measures are either within the boundaries of the allotment or part of the constructed building.

9. Bushfire Risk Assessment

Table 1; reference AS 3959, 2009 table 2.4.2

Determination of the category of bushfire attack for the site, and subsequent required building standards.

Direction	Distance to classified vegetation	Vegetation Classification	Assessment of effective slope	FDI	Bushfire Attack Level
North	21.269m	Remnant	Upslope	100	BAL-19
East	15m	Grassland	Downslope >0-5 degrees	100	BAL-19
South	16m	Remnant	Upslope	100	BAL-19
West	16m	Remnant	Upslope	100	BAL-19

Summary: Based upon the relevant provisions of PBP the anticipated radiant heat attack for the site is <19 kW/m² and the subsequent Bushfire Attack Level is BAL-19 AS 3959- 2009.

10. Assessment of proposed new garage and retreat.

With reference to Chapter 4.3.6 (f) of Planning for Bushfire Protection 2006, as the garage is within 10m of the main residential building the garage shall be built to the same constructions requirements as that building. In this instance the garage shall be built to BAL-19.

11. The extent to which the construction conforms or deviates from Chapter 4 of 'Planning for Bushfire Protection 2006'

Performance Criteria	How this development meets acceptable solutions
The intent may be achieved where:	
<u>In relation to APZ's:</u> -Defendable space is provided onsite. -An APZ is provided and maintained for the life of the building.	Defendable space is provided on all sides of the building. Asset protection zones are provided for on site.
<u>In relation to siting and design:</u> - Building are sited and designed to minimise the risk of bushfire attack.	The siting of the building has been determined to keep radiant heat levels below 19kW/m2.
<u>In relation to construction standards:</u> It is demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Construction standards have been recommended in accordance with the requirements of <i>Planning for Bushfire Protection 2006</i> and <i>AS 3959-2009 Construction of buildings in bushfire prone areas</i> .
<u>In relation to access requirements:</u> Safe operational access is provided [and maintained] for emergency service personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire.	This site has direct access to public roads. Recommendations for internal access road will be made in accordance with the requirements of Chapter 4.1.3 of <i>Planning for Bushfire Protection 2006</i> .
<u>In relation to water and utility services:</u> -Adequate water and electrical services are provided for fire fighting operations. -Gas and electricity services are located so as to not contribute to the risk of the building.	The site is not serviced by a reticulated water supply. Recommendations for water supply shall be made in accordance with Table 4.2 of <i>Planning for Bushfire Protection 2006</i> . This report shall recommend compliance with PBP 4.1.3 for services including electricity and gas.
<u>In relation to landscaping:</u> It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignition.	Landscaping shall comply with Appendix 5 of <i>Planning for Bushfire Protection 2006</i> .
<u>In relation to emergency and evacuation planning</u>	It is advised the residents should complete a <i>Bushfire Survival Plan</i> as formulated by the NSW Rural Fire Service and Fire and Rescue NSW.

12. Recommendations

The following recommendations are made for the bushfire protection measures for the proposed construction of a new class 1a dwelling at No 138 Roscrea Drive, Mulgoa, NSW and are based upon the relevant provisions of the NSW RFS guideline entitled *Planning for Bushfire Protection 2006*.

1) <u>Construction standard.</u>	New construction shall comply with a minimum standard of section 3 [construction general] and section 6 (BAL-19), AS3959-2009 and Addendum to Appendix 3 of <i>Planning for Bushfire Protection 2006</i> .
2) <u>Electricity and gas supply</u>	As far as practical, new electricity and gas supplies shall be installed in accordance with the requirements of 4.1.3 of PBP. Note: 4.1.3 of PBP requires the ' <i>where practical, electrical transmission lines should be underground</i> ' and ' <i>the location of gas services will not lead to ignition of surrounding bushland of the fabric of the building</i> '.
3) <u>Asset Protection Zones</u>	At the commencement of building works and in the perpetuity, APZ's shall be managed in accordance with the NSW RFS document 'Standards for asset protection zones' and have been made in accordance with Table 2.4.2 of AS 3959-2009. North: 16m minimum East: 15m minimum South: 16m minimum West: 16m minimum
4) <u>Emergency Risk Management</u>	It is advised the residents should complete a <i>Bushfire Survival Plan</i> as formulated by the NSW Rural Fire Service and Fire and Rescue NSW. An emergency evacuation is not recommended as a condition of consent.
5) <u>Adjacent Structures [class 10b]</u>	At the planning stage, class 10b buildings in bushfire prone areas should be non-combustible. [Class 10b buildings include a fence, retaining wall or free standing wall, swimming pool or the like].
6) <u>Water supplies</u>	In recognition that no reticulated water supply exists a minimum of 20,00L water tank must be installed and available for Firefighting in accordance with Table 4.2 of PBP. A 65mm Stortz outlet with a gate or Ball valve is provided. These valves and pipes are adequate for water flow and are metal rather than plastic. Underground tanks have a access hole of 200mm to allow tankers to refill direct from the tank. A hardened ground surface for truck access is supplied within 4m of the access hole. Above ground tanks are manufactures of concrete or metal and raised tanks have their stands protected. Tanks on the hazard side of the building are provided with adequate shielding for the protection of firefighters. All above ground water pipes, external to the building are metal including and up to any taps. Pumps are shielded.
7) <u>Property Access</u>	Minimum road width is 4.5m Minimum vertical clearance of 4m. Turning circle shall have a minimum 12m outer radius. Curves shall have a minimum inner radius of 6m. The minimum distance between inner and outer curves is 6m. Crossfall is no more than 10 degrees. Maximum grade shall be no more than 10 degrees.

13. Summary

This report consists of a bushfire risk assessment for proposed construction of a new class 1a dwelling at No 138 Roscrea Drive, Mulgoa, NSW.

The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development of bushfire prone areas are applicable. The proposed development will be constructed to the minimum standard required in accordance with the guidelines of *Planning for Bushfire Protection 2006* and *AS 3959-2009 Construction of buildings in bushfire prone areas*.

This report has considered all of the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations of section 12 of this report, it is my considered opinion that the development satisfies the Objectives and Performance requirements of the *Building Code of Australia, Planning for bushfire Protection 2006* and *Australian Standard AS3959, 2009*.

*Note: Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand a bushfire attack on every occasion. This report is a Bushfire Hazard Assessment that provides the required information to assist Local Councils and the Rural fire Service in determining compliance in accordance with *Planning for Bushfire Protection 2006* and *AS3959, 2009*. The local Council is the final consenting authority and the construction of the building must comply with the recommendations included in the council's conditions of consent.*



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14. References

Australian Building Codes Board

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Volume 1 & 2

Canprint

Australian Building Codes Board [2001]

Fire Safety Engineering Guidelines

Edition 2001

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D. Drysdale D. [1998]

Introduction to Fire Dynamics 2nd Edition

John Wiley & Sons Ltd

NSW Government Environmental Planning and Assessment Act [1979]

Part 79BA-Consultation and development consent- Certain bushfire prone land

NSW Government Printer

Planning NSW [2006]

Planning for Bushfire Protection 2006

A guide for Councils, Planners, Fire Authorities, Developers and Home Owners

This document provides the necessary planning considerations when developing areas for residential use in residential, rural residential, rural and urban areas when development sites are in close proximity to areas likely to be affected by bushfire events and replaces Planning for Bushfire Protection 2001.

This document is essential reading. Download a copy from the RFS website or purchase a copy through the NSW Government online shop or phone 9228 6333.

Ramsay C & Rudolph L [2003]

Landscape and building design for bushfire prone areas

CSIRO Publishing

Standards Australia [2009]

Australian Standards 3959

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