NSW Rural Fire Service –

Australian Standard AS3959-1999

SUMMARY TABLE

PLEASE DO NOT USE THIS ABRIDGED VERSION ALONE.
The full version can be purchased from Standards Australia at **www.standards.org.au.**

Introduction

This is an abridged version of *Australian Standard 3959: Construction of Buildings in Bush Fire Prone Areas* (AS3959) and provides some detail for the construction of buildings in bush fire prone areas. Other measures of mitigating the impact of bush fire on a development including planning, design, siting and landscaping which are outlined in *Planning for Bush Fire Protection, 2006* (PBP).

This document provides a summary of the requirements of Levels 1, 2 and 3 construction for different components of a structure. Incorporating these measures into the design of a building will provide protection against two of the main forms of bush fire attack, those being:

- Ember Attack
- Radiant Heat

In NSW, if a structure is subject to flame contact, the third main form of bush fire attack, building design and measures will need to go beyond those prescribed in AS3959 and meet the performance criteria of PBP. Applications to build within the flame zone will need to demonstrate that the structure can withstand ember attack, flame contact and the modelled radiant heat load.

Development on Bush Fire Prone Land needs to meet the planning requirements of PBP as well as any bush fire construction requirements under the Building Code of Australia (BCA).

(a) Residential Buildings and Special Fire Protection Purpose Developments

Where development occurs in a bush fire prone area, certain bush fire provisions of the BCA will apply (including various NSW variations) to buildings of classes 1, 2, 3, 4 and those class 9 buildings that are also a special fire protection purpose.

Where a development, submitted under section 79BA of the *Environmental Planning and Assessment Act* (EP&A Act), complies with the deemed-to-satisfy provisions of PBP and AS 3959-1999, then the consent authority can determine compliance and issue the relevant approval without referral to the RFS. Where an 'alternate solution' is offered for these classes of buildings, the RFS will consider the proposal under section 79BA (or section 100B in the case of a special fire protection purpose) and the consent authority will issue the approval in compliance with the RFS consent conditions or recommendations.

The construction requirements of AS 3959 - *1999 Construction of Buildings in Bush Fire-prone Areas* are accepted by PBP as the deemed-to-satisfy construction standard for buildings in designated bush fire prone areas.

To determine the level of construction that is required for a proposed development, applicants will need to follow the site assessment methodology for determining the level of bush fire attack outlined in Appendix 2 & 3 of PBP. The level of bush fire attack on a building will have a corresponding construction standard as outlined in Table 1 below.

Table 1 - Categories of bush fire attack and corresponding construction standard.

Level of Bush Fire Attack	Construction Standard
Low	No Requirement
Medium	Level 1
High	Level 2
Extreme	Level 3
Flame Zone	Outside the scope of AS3959

There are currently two ways in which applicants can determine the level of bush fire attack on their proposed development. They are:

- Use the Single Dwelling Application Kit available on the RFS website (www.rfs.gov.au).
- Engage the services of a bush fire consultant to prepare a Bush Fire Assessment Report for the proposal. A list of consultants is available on the Fire Protection Association Australia website (www.fpaa.com.au).

Please do not use this abridged version alone. The full version can be purchased from Standards Australia at www.standards.org.au.

Levels of Construction

Building Component	Level 1	Level 2	Level 3
Flooring Systems	• A concrete slab-on-the-ground. OR • A suspended concrete or framed floor (>600m above finish ground level), supported by complying posts, columns, stumps, piers, poles or walls. OR • A suspended timber floor, framed with timber or metal, fully enclosed or unenclosed with any timber flooring, bearers and joists of fire-retardant-treated timber.	• As for level 1.	• As for level 2 Except where a framed floor is greater than 600mm above the finished ground level, then fire-retardant-treated timber or non-combustible sheeting material is to be used.
Supporting Posts, Columns, Stumps, Piers and Poles	• Non-combustible. OR • Fire-retardant-treated timber for a minimum 400 mm above the finished ground level. OR • Timber mounted on galvanized metal shoes with a clearance of not less than 75 mm above the adjacent finished ground level or paving level. (The above do not apply where the sub-floor space is totally enclosed)	• As for level 1.	• As for level 2. Except that all timber shall be fire-retardant-treated to full length.

Levels of Construction

Building Component	Level 1	Level 2	Level3
External Walls	• External walls shall be one, or a combination of external leaf masonry, concrete, pise, rammed earth or stabilised earth or a complying framed wall. Where the external leaf or cladding is of a combustible sheetmaterial and is less than 400 mm above finished ground level, the cladding shall be protected for not less than 400 mm above the adjacent finished ground with a non-combustible material or fire-retardant-treated timber.	• As for level 1 Except PVC cladding is not permitted and all external timber wall cladding shall be fire-retardant-treated timber.	• As for level 2
Windows	• All open-able windows shall be screened with corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture size of 1.8 mm in such a way that the entire opening remains screened when the window is opened.	• As for level 1. Except aluminium mesh shall not be used. Timber must be fire-retardant- treated timber except where protected by shutters. Where leadlight windows are used, they shall be protected by non-combustible shutters or toughened glass.	• As for level 2. Except where windows are not protected by non-combustible shutters, they shall be glazed with toughened glass.

Levels of Construction

Building Component	Level 1	Level 2	Level3
External Doors	• Weather strips or draught excluders. And • Tight fitting door screens fitted with corrosion-resistant steel,bronze or aluminium mesh with a maximum aperture size of 1.8 mm.	• As for level 1. Except no aluminium mesh shall be used. Leadlight glazing shall be protected by non-combustible shutters or toughened glass.	• As for level 2. Except timber doors shall be fire-retardant-treated timber or have non-combustible covering. OR Doors shall be protected by non-combustible shutters. OR Doors shall be solid-core having a thickness not less than 35 mm.
Vents and Weepholes	• Corrosion-resistant steel, bronze or aluminium spark guards with a maximum aperture size of 1.8 mm.	• As for level 1. Except aluminium mesh shall not be used.	• As for level 2.

Levels of Construction

Building Component	Level 1	Level 2	Level3
Roofs	General • Timber shakes or shingles shall not be used. • The roof/wall junction shall be sealed with suitable non-combustible materials. • Sarking shall have a flammability index of not more than five (5). Sheeted Roofs • Only metal or fibre-cement sheet shall be used, all gaps must be sealed with complying material. Roof lights • Shall be sealed with a non-combustible sleeve or lining. • Vented roof lights shall be provided with corrosion-resistant steel or bronze mesh having a maximum aperture size of 1.8mm.	• As for level 1. Except that all roof sheeting shall be non-combustible and sarked, and roof light glazing shall be of wired glass (thermoplastic material or toughened glass shall not be used).	• As for level 2. Except that no fibre-reinforced cement or aluminium sheet.
Eaves	• Enclosed, and the fascia or the gaps between the rafters sealed.	• As for level 1. Except that all timber eaves lining and joining strips shall be fire-retardant-treated timber.	• As for level 2. Except that aluminium shall not be used.

Levels of Construction

Building Component	Level 1	Level 2	Level3
Fascias	• No Requirements.	• Non-combustible or fire retardant-treated-timber.	• As for level 2. Except that no fibre-reinforced cement or aluminium sheet shall be used.
Gutters and Downpipes	• Any device used to stop leaves collecting in the gutters shall have a flammability index of not greater than 5 when tested in accordance with AS 1530.2.	• As for level 1.	• As for level 2.
Verandas and Decks	• A reinforced concrete suspended slab supported by complying posts, or complying slab-on-the-ground. OR • Complying sheeted or tongued and grooved solid flooring. OR • Complying spaced decking.	• As for level 1. Except that if spaced decking is used, fire-retardant-treated-timber.	• As for level 2. Except that all materials shall be non-combustible or where timber is used, it shall be fire-retardant-treated timber.
Service Pipes (Water and Gas)	• All exposed pipes shall be metal. • Pipes of other material must be buried to a depth of at least 300 mm below the finished ground level.	• As for level 1.	• As for level 2.