



Timber in Bushfire Prone Areas

In many parts of Australia, the construction of new buildings and additions to existing buildings will be assessed as being in a Bushfire-prone Area. The relevant Australian Standard – AS 3959 – provides six different Bushfire Attack Levels for proposed construction:

- | | |
|--------------|-------------------------|
| ① BAL – LOW | ④ BAL – 29 |
| ② BAL – 12.5 | ⑤ BAL – 40 |
| ③ BAL – 19 | ⑥ BAL – FZ (Flame Zone) |

Each level is based on the assessed threat dependant on the relevant Fire Danger Index, the surrounding type of vegetation (e.g. forest, woodland, shrubland etc), the distance from the site to the vegetation and the ‘effective slope’ under the vegetation.

As the assessed threat increases, so do the restrictions on the building materials that may be used. Where there are restrictions on the building materials, timber is permitted in many applications as the tables on pages 3 through 6 ‘Simplified Bushfire Standard Complying Timber Construction in NSW’ show.



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The type of timbers that are allowed are dependent on the Bushfire Attack Level of the site. These timber can be summarised as

BAL12.5 and 19

- General Timber – Timber with density of 750 kg/m³ or greater, are timbers density at 12 percent moisture content. Suitable timbers are listed in AS 3959 Table E1.
- Joinery Timber (window and doors only) – Timber with density of 650 kg/m³ or greater, are timbers density at 12 percent moisture content. Suitable timbers are listed in AS 3959 Table E2.

BAL29 – Bushfire resisting timber

Can be timber with an inherent resistance to fire or fire retardant treated.

The following seven timber species have been tested and found to meet the required parameters without having to be subjected to fire retardant treatment:

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- Blackbutt
 - Merbau
 - Red Ironbark
 - River Red Gum
 - Silvertop Ash
 - Spotted Gum
 - Turpentine
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It should be noted that AS 3959 does not replace any other standards which might set out minimum requirements for construction in a particular area but rather AS 3959 sets out requirements which are dependent upon the degree of assessed threat posed by the Bushfire Attack Level (BAL) and which are additional to the requirements of those other standards.

Further Information

The external use of building materials in houses built in declared bushfire prone areas is controlled under the Building Code of Australia (BCA) Parts P2.3.4 and 3.7.4. Before the BCA requirements apply, the local authority must declare the area, in which a house is to be built, to be a bushfire-prone area.

Compliance with Australian Standard AS 3959 Construction of Buildings in Bushfire Prone Areas is 'deemed to satisfy' the BCA requirements for Class 1 Buildings along with the NSW Rural Fire Services – Planning for Bush Fire Protection 2006.



Simplified Bushfire Standard Complying Timber Construction in NSW

In NSW building regulations vary from the requirements in the Acceptable Construction Manual within the Building Code of Australia (BCA) which is AS 3959 Construction of Buildings in Bushfire-prone Areas standard. The table below incorporates the requirements of both AS 3959 Construction of Buildings in Bushfire-prone Areas 2009, as well as Planning for Bushfire Protection – Addendum: Appendix 3, NSW Rural Fire Service – Planning for Bush Fire Protection.

Although every effort was taken to reflect regulations of AS 3959 Construction of Buildings in Bushfire-prone Areas standard it is recommended this information sheet is used in conjunction with AS 3959, especially where in doubt.

■ Stairs/Decks/Ramps

Building Element	Subfloor Space	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
Wall enclosing subfloor space	Enclosed	Less than 400mm from the ground or an external horizontal surface ¹ use timber framing provided the framing is clad with non-combustible material such as fibre cement, bushfire-resisting timber ² or timber with density of 750 kg/m ³ or greater. 400 mm or more above the ground there are no construction requirement any timber can be used ⁴	Timber framing provided the framing is clad with non-combustible material or bushfire-resisting timber ²	Timber framing provided the framing is clad with non-combustible clad, i.e. masonry or min 9 mm fibre cement	NSW building regulations do not recognise deemed-to-satisfy construction solution within this BAL. Building designs will require an alternative solution
Subfloor supports (posts, stumps, columns, stair stringers etc)	Enclosed	Any timber ⁴			
	Open	Bushfire-resisting timber ²		Metal	
Deck/ramp bearers and joists	Enclosed	Any timber ⁴			
	Open	Bushfire-resisting timber ²		Metal, concrete or brick	
Decking and stair treads	Enclosed	Bushfire-resisting timber ²		Tiled or concrete decks	
	Open				
Balustrades and Handrails	Enclosed	Less than 125 mm from any glazing or any combustible wall handrails and balustrades shall made from non combustible material or bushfire-resisting timber ² 125 mm or more from the building handrails and balustrades have no requirement any timber can be used ⁴		Less than 125 mm from any glazing or any combustible wall handrails and balustrades shall made from non-combustible material	
	Open				

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Elevated Floors/Subfloors

Building Element	Subfloor Space	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
Wall enclosing subfloor space	Enclosed	Less than 400mm from the ground or an external horizontal surface ¹ use timber framing provided the framing is clad with non-combustible material such as fibre cement, bushfire-resisting timbers ² or timber with density of 750 kg/m ³ or greater. 400 mm or more above the ground there are no construction requirement any timber can be used ⁴	Timber framing provided the framing is clad with non-combustible material or bushfire-resisting timber ³	Timber framing provided the framing is clad with non-combustible clad, i.e. masonry or min 9 mm fibre cement	NSW building regulations do not recognise deemed-to-satisfy construction solution within this BAL. Building designs will require an alternative solution
Subfloor supports (posts, stumps, columns etc)	Enclosed	Any timber ⁴			
	Open	Bushfire-resisting timber ²		Brick, steel or concrete stumps	
Bearers and joists	Enclosed	Any timber ⁴			
	Open	Less than 400 mm above the ground use Bushfire-resisting timbers ² or line the underside of the floor framing with fibre cement or sheet metal (roofing) 400 mm or more above the ground there are no construction requirement any timber can be used ⁴	Any timber provided the underside of the lowest joist or bearer is protected with a non-combustible material such as a metal roof sheet or fibre-cement sheeting		
Flooring	Enclosed	Any timber ⁴			
	Open	Less than 400 mm from the ground provided the underside is lined with sarking or mineral wool or Bushfire-resisting timbers ² 400 mm or more above the ground there are no construction requirement any timber can be used ⁴	Any timber provided the underside of the lowest joist or bearer is protected with a non-combustible material such as a metal roof sheet or fibre-cement sheeting		

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Walls

Building Element	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
External wall surface	Less than 400mm above the ground or an external horizontal surface ¹ , the cladding is to be timber with density of 750 kg/m ³ or greater ³ , bushfire-resisting timbers ² or with non-combustible material 400 mm or more above the ground or an external horizontal surface ¹ there are no construction requirement: any timber can be used ⁴	Bushfire-resisting timber and sarking required between cladding and framework	Non-combustible clad, i.e. masonry or min 9 mm fibre cement	NSW building regulations do not recognise deemed-to-satisfy construction within this BAL. Building designs will require an alternative solution
External wall framing	Any timber ⁴			
Internal wall surface	Any timber ⁴			
Internal wall framing	Any timber ⁴			

External Mouldings/Internal Timbers

Building Element	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
Internal wall framing		Any timber ⁴		NSW building regulations do not recognise deemed-to-satisfy construction solution within this BAL. Building designs will require an alternative solution
Internal Timber (Doors, joinery, wall lining, ceiling linings, staircases, flooring over concrete slab etc)		Any timber ⁴		

Roof Framing

Building Element	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
Roof framing under compliant non-combustible roof covering ²		Any timber ⁴		NSW building regulations do not recognise deemed-to-satisfy construction solution within this BAL. Building designs will require an alternative solution

■ Framing for Roofed Structures like Verandas, Garages, Carports

Building Element	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
Where attached structure separated from the building by a fire rated FRL 60/60/60 wall that extends to the underside of a non-combustible roof covering ⁵		Any timber ⁴		NSW building regulations do not recognise deemed-to-satisfy construction solution within this BAL. Building designs will require an alternative solution
Where the roof of an attached structure is separated from the roof space of the main building by a masonry veneer wall, 90 mm thick		Any timber ⁴		

NOTES

- 1 An external horizontal surface or a ledge includes decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall or window or door.
- 2 Bushfire-resisting timbers include Blackbutt, Merbau (Kwila) and Red Ironbark, River Red Gum, Spotted Gum, Silver top Ash and Turpentine.
- 3 Timber with density of 750 kg/m³ or greater, are timbers density at 12 percent moisture content. Suitable timbers are listed in AS3959 Table E1.
- 4 Consideration such durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt in this guide.
- 5 Complying roof systems include conventional non combustible roof and materials (tile, metal sheet) ensuring any gaps over 3mm are protected by ember guards. For further detail on sealants, skylights, etc refer to AS 3959.
- 6 Wood Solutions Guide 04: *Building with Timber in Bushfire-prone Areas* is available for free on www.woodsolutions.com.au

Disclaimer:

Whilst every effort has been made to ensure that this publication is in accordance with current information, it is not intended as an exhaustive statement of all relevant data. All comments in this information sheet are written with timber framed construction in mind and may exclude other forms of construction. In addition, successful design and construction depends upon numerous factors outside the scope of this publication. The authors and publishers accept no responsibility for errors in, or omissions from this publication, nor for specifications or work done or omitted in reliance on this publication.