

Managing bushfire risks in timber buildings

La Niña may be hanging around but fire season looms on the horizon. Good timber choices can help mitigate worries.

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As we head into another warm summer, some will look forward to the festivities around Christmas/New Year, some others might say “bring on those juicy mangoes” and some cricket nuffies like me will wait in earnest for Test cricket to start. But there will be some others who may not be able to think beyond bushfires.

However, if you prepare well and do the right thing for your house and your surroundings, you can lessen your worries. For those who plan to build in a bushfire-prone area this summer, you can think timber! There are effective solutions even for the most bushfire-prone areas. Let’s explore the intricacies of a ‘bushfire-compliant’ timber building and also discuss the key role the property owner plays in protecting it.

We should start by understanding the intent of the Australian Standard AS 3959:2018 – *Construction of buildings in bushfire-prone areas*. The primary concern of this standard is to improve “the ability of buildings in designated bushfire-prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants, until the fire front passes, as well as to the building itself.” This standard is referenced in The National Construction Code (NCC) as a Deemed-to-Satisfy means of compliance when building in a designated bushfire-prone area. This means if your home is designed and built as per AS 3959, you comply with the Performance Requirements of the NCC.

BUSHFIRE ATTACK LEVELS

The Bushfire Attack Level (BAL) is a “means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact”. This serves as the basis for establishing the construction requirements to improve the protection of building elements from attack by bushfires.

AS 3959 divides the individual sites into six BAL ratings, determined by factors including the fire danger index (FDI), wind speed, nature of surrounding vegetation, the slope of the land and the distance of the house from vegetation. As explained in Table 1 (below),

the ratings range from BAL LOW (no need for special requirements) to BAL FZ (flame zone), which are categorised based on the measure of exposure to heat flux. Each BAL rating has different construction practice requirements that we will briefly discuss below.

RATING	RISK OF EXPOSURE				Heat flux exposure
	Ember attack	Burning debris	Radiant heat	Direct flame	
BAL LOW	Insufficient risk to warrant specific construction requirements				N/A
BAL 12.5	Low To Medium	No	No	No	12.5 kW/m2
BAL 19	Medium	Medium	Likely	No	19.0 kW/m2
BAL 29	Increased Level	Increased Level	Increased Level	No	29.0 kW/m2
BAL 40	High	High	High	Likely	40.0 kW/m2
BAL FZ	Extremely High	Extremely High	Extremely High	High	>40.0 kW/m2

Above: Table 1, adapted from Appendix G, AS 3959

Element	Condition	BAL-19 ⁴	BAL-29	BAL-40	BAL-FZ
All enclosed framing	All	AT			
Unenclosed sub-floor framing	≤ 400mm from ground	BRT		SP	
	Otherwise	AT	AT ²		
All decking (enclosed or unenclosed)	< 300mm from glazing that are <400mm from deck surface	BRT ¹	BRT		
	Otherwise	AT			
Verandah posts	≤ 400mm from deck surface/ ground	BRT	BRT		
	Otherwise, if mounted on galv stirrups with >75mm ground clearance	AT	BRT		
Balustrades or handrails	< 125mm from any glazing or combustible wall	AT	BRT		
	Otherwise	AT			
Fascia, barges and eaves linings	All	AT	BRT ³	SP	
External cladding	≤ 400mm from deck surface/ ground	BRT ¹	BRT ³		
	Otherwise	AT			

Notes: (1) Timber species given in Appendix E1 can be used in addition to BRT. (2) Use BRT for framing of unenclosed subfloor spaces of verandahs, decks, steps, ramps and landings. (3) BRT can be avoided for eaves linings and external cladding if a suitable FC sheet is provided. (4) BAL-12.5 to use the same requirement as BAL-19.

AT	Any Timber	BRT	Bushfire Resisting Timber	SP	Special treatment required using a system approach
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Above: Table 2 – Timber usage in varying BAL zones

TABLES: COURTESY MEYER TIMBER

CONSTRUCTION REQUIREMENTS

Bushfire Resisting Timber (BRT) can be solid timber, laminated or in a reconstituted form that meets the test specified in Appendix F of AS 3659 and is deemed to be acceptable to withstand exposure up to a BAL 29 level. There are seven BRT species listed in this appendix, of which the easiest to source is Merbau (Kwila), then Blackbutt, Spotted Gum, and Red Ironbark. The other three, Silvertop Ash, River Red Gum and Turpentine, are no longer readily available in large quantities.

As the BAL rating increases, the restrictions in building materials, design and construction also increase. Table 2 (opposite page, bottom) may be used as a convenient guide on what type of timber is allowed. For more information, refer to the code itself or the WoodSolutions Technical Design Guide 4 - *Building with timber in bushfire-prone areas* (Feb 2020, www.woodsolutions.com.au/publications) or the Meyer Timber Factsheet *Timber in Bushfire Zones* (https://meyertimber.com.au/wp-content/uploads/MeyerTimber_Bushfire_FactSheet.pdf).

Although BRT can only be used up to BAL 29, timber can still be a construction material in BAL 40 and BAL FZ zones through a systems approach by conducting fire

tests as per AS 1530.8. As an example, Appendix H of the standard incorporates two timber-framed roof systems, which are fire tested and approved as deemed to satisfy BAL FZ requirements.

Another example is the use of 16mm fire-rated plasterboard as external cladding on a timber frame in BAL FZ, which easily satisfies the requirements of AS 3959 (CI 9.4.1) where the exposed components of an external wall in BAL FZ require a system with a fire resistance level of only 30 minutes when tested from the outside.

PROPERTY OWNERS' RESPONSIBILITIES

Property owners should bear in mind that the construction of the building is only one of several measures of mitigating damage from bushfires. A combination of other measures such as planning, siting, water supply, access, landscaping and maintenance also play a crucial role in protecting your building.

While it is important to use the correct materials and construction details to achieve compliance with AS 3959, it is just as important to pay emphasis on these other measures including maintenance. A fully-compliant building of today may not necessarily provide you with protection in the future unless measures are taken to maintain the bushfire resilience of your home and garden. The responsibility falls on the

homeowner to ensure simple things are done. For example, a well-constructed building will not protect you from flying embers if you haven't cleaned your gutters.

As part of the risk management process, an understanding of the vulnerable areas of your house is important. These include roof gutters, gaps in roof or wall cavities, sub-floor areas where embers can enter, corners or horizontal surfaces where embers can gather, and even vertical surfaces (windows, doors etc) that are exposed to ember attacks.

However, it must be noted that when your well-maintained and fully compliant building is subjected to the unpredictable behaviour of fire and extreme weather conditions, it may still not survive a bushfire event. Hence a reminder that the property owner must remain vigilant and follow instructions from authorities on a suitable survival strategy when these extreme events occur.

That being said, timber houses can be designed and constructed with the approved materials and systems to withstand the most extreme bushfire conditions. If you plan well and take the right measures to mitigate damage from bushfires, wherever you live or intend to build your new home this summer, you should be able to rest easy and enjoy the juicy mangoes or the cricket just as much as the rest of us. **T**



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