Building with Timber – Construction requirements for Bushfire Attack Levels as per AS 3959-2018 (Amdt No. 1) Construction of buildings in bushfire-prone areas

(This summary of timber requirements, extracted from AS 3959-2018 (Amdt No. 1), does not cover all aspects of AS 3959 which should be referred to when designing and specifying to the Standard.)

Wood Solutions
design and build
woodsolutions.com.au

Building Element		BAL-LOW	BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ
Roof	**Tiled**	NR	• Fully sarked (Flammability Index not more than 5) • Installed directly below tile battens • Must cover entire roof area including ridge and extend into gutters and valleys with no gaps where the sarking meets facias, gutters, valleys and the like.				• Constructed in accordance with AS 3959 Appendix H, ***or*** • System complies with AS 1530.8.2 when tested from the outside
	Sheet	NR	• Fully sarked (Flammability Index not more than 5) • Foil-backed insulation blankets may be installed over battens • Have any gaps sealed with – - Mesh or perforated sheet used as a screen with a maximum 2 mm aperture made of corrosion-resistant steel, bronze or aluminum, ***or*** - Mineral wool, ***or*** - Other non-combustible material				
Fascia & bargeboards		NR	NR	NR	• Bushfire-resisting timber • Metal fixed at 450 mm centres	• Complying with AS 1530.8.1	• Complying with AS 1530.8.2
Eaves linings		NR	NR	NR	• 4.5 mm fibre-cement • Bushfire-resisting timber	• 6 mm fibre-cement • 6 mm calcium silicate	• FRL - /30/30, ***or*** • Complying with AS 1530.8.2
Windows		NR	• Behind bushfire shutters (any timber-framed window), ***or*** • Behind screens (any timber-framed window), ***or*** • Less than 400 mm off horizontal surface - Frames - *Bushfire-resisting timber, **or*** - *Timber species from E2* - Glazing: **4 mm** Grade A safety and openable part screened • Greater than 400 mm off horizontal surface - annealed glass - screens to openable parts of window	• Behind bushfire shutters (any timber-framed window), ***or*** • Behind screens (any timber-framed window), ***or*** • Less than 400 mm off horizontal surface - Frames - *Bushfire-resisting timber **or*** - *Timber species from E2* - Glazing: **5 mm** toughened glass and openable part screened • Greater than 400 mm off horizontal surface - annealed glass - screens to openable parts of window	• Behind bushfire shutters (any timber-framed window), ***or*** • Windows - Glazing: - ***5 mm** toughened glass and if less than 400 mm from a horizontal surface and externally screened* - *Screens to openable parts of window* - Frames: Bushfire-resisting timber	• Behind non-combustible bushfire shutters (any timber-framed window), ***or*** • Windows - Glazing: - ***6 mm** toughened glass* - *External screens to all parts of window* - Frames: metal - Seals: Flammability Index not more than 5	• Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside – any timber-framed window), ***or*** • Window system having FRL of –/30/– and screens to openable part of window, ***or*** • Window system complying with AS 1530.8.2 and the openable part of the window screened
External Doors	**Side hung**	NR	• Behind bushfire shutters (any timber door), ***or*** • Behind screens (any timber door), ***or*** • Unglazed Door - Joinery - *Non-combustible **or*** - *Solid, laminated or reconstituted timber having minimum thickness of 35 mm for the lower 400 mm **or*** - *Timber hollow core with a non-combustible kickplate for the lower 400 mm* • Glazed door - Glazing: as per windows - Joinery less than 400 mm from a horizontal surface: - *Bushfire-resisting timber **or*** - *Timber species from E2* - Joinery greater than 400 mm from a horizontal surface - NR • Door frame/jamb - Less than 400 mm from a horizontal surface - *Bushfire-resisting timber **or*** - *Timber species from E2* - Greater than 400 mm from a horizontal surface - NR		• Behind bushfire shutters (any timber door), ***or*** • Behind screens (any timber door), ***or*** • Unglazed Door - Joinery - *Non-combustible, **or*** - *Solid, laminated or reconstituted timber having minimum thickness of 35 mm, **or*** • Glazed door - Glazing: **6 mm** toughened glass - Joinery: Bushfire-resisting timber • Door frame/jamb: Bushfire resisting timber	• Behind non-combustible bushfire shutters (any timber door), ***or*** • Unglazed Door - Joinery - *Non-combustible, **or*** - *Solid, laminated or reconstituted timber having minimum thickness of 35 mm, with lower 400 mm screened with a mesh* • Glazed door - Glazing: **6 mm** toughened glass and externally screened - Joinery: Non-combustible • Door frame/jamb: Metal • Seals: Flammability Index not more than 5	• Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside – any timber door), ***or*** • Door system having FRL of –/30/–, ***or*** • Door system complying with AS 1530.8.2 (Note: Seals are not to compromise performance)
	Sliding door	NR	• Behind bushfire shutters (any timber-framed door), ***or*** • Behind screens (any timber-framed door), ***or*** • Glazed door: Grade A safety glass min. **4 mm** thickness - Joinery less than 400 mm from a horizontal surface - *Bushfire-resisting timber **or*** - *Timber species from E1* - Joinery greater than 400 mm from a horizontal surface – NR	• Behind bushfire shutters (any timber-framed door), or • Behind screens (any timber-framed door), ***or*** • Glazed door: **5 mm** toughened glass - Joinery less than 400 mm from a horizontal surface - *Bushfire-resisting timber **or*** - *Timber species from E1* - Joinery greater than 400 mm from a horizontal surface – NR	• Behind bushfire shutters (any timber-framed door), ***or*** • Behind screens (any timber framed door), ***or*** • Glazed door - Glazing: **6 mm** toughened glass • Door frame/jamb - Bushfire-resisting timber	• Behind bushfire shutters (any timber-framed door), ***or*** • Glazed door - Glazing: FRL –/30/–, or **6 mm** toughened glass behind screens to all parts of door - Door frame/jamb: Metal - Seals: Flammability Index not more than 5	• Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside – (any timber-framed door), ***or*** • Door system having FRL of –/30/–, ***or*** • Door system complying with AS 1530.8.2

NR – No requirement. Note: Construction requirements required for a higher BAL can be used for a lower BAL e.g. BAL–FZ requirements can be used in BAL–40.

Building with Timber – Construction requirements for Bushfire Attack Levels as per AS 3959-2018 (Amdt No. 1) Construction of buildings in bushfire-prone areas

(This summary of timber requirements, extracted from AS 3959-2018 (Amdt No. 1), does not cover all aspects of AS 3959 which should be referred to when designing and specifying to the Standard.)

Wood Solutions
design and build
woodsolutions.com.au

Building Element			BAL-LOW	BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ
External Walls	**Cladding**	**Light-weight**	NR	Any cladding within 400 mm from a horizontal surface • Non-combustible material ***or*** • Fibre-cement sheet minimum 6 mm thickness or • Bushfire-resisting timber ***or*** • Timber species listed in E1 ***or*** • Timber logs, gauge planed, with minimum: - Density 680 kg/m³, ***and*** - 90 mm nominal overall thickness, ***and*** - 70 mm thickness at interface of two logs		• Fibre-cement minimum 6 mm thickness ***or*** • steel sheet ***or*** • bushfire-resisting timber or • Timber logs, gauge planed, with minimum: - Density 680 kg/m³, ***and*** - 90 mm nominal overall thickness, ***and*** - 70 mm thickness at interface of two logs	• Fibre-cement minimum 9 mm thickness ***or*** • steel sheet ***or*** • a system complying with AS 1530.8.1	• A system complying with AS 1530.8.2 when tested from outside, ***or*** • A system with an FRL of 30/30/30 ***or*** –/30/30 when tested from outside *Note: Fire-rated, timber-clad wall systems can achieve this performance requirement.*
		Brick	NR	NR	NR	NR	NR	NR
	Framing members		NR	NR	NR	NR	NR	NR
Floors (bearers, joists, flooring)	**Enclosed+**		NR	NR	NR	NR (includes mesh walls)	NR	NR
	Unenclosed			• Flooring materials less than 400 mm - non-combustible, ***or*** - bushfire-resisting timber, ***or*** - non-bushfire-resisting timber, particleboard or plywood flooring with the underside lined with sarking or mineral wool insulation • Flooring materials greater than or equal to 400 mm – NR			• Flooring material - non-combustible, ***or*** - Timber flooring members must have the underside lined with a non-combustible material (eg fibre-cement or metal sheet), ***or*** - complying with AS 1530.8.1	• FRL of at least 30/30/30 and non-combustible surface material, ***or*** • Underside of combustible floor system protected with a 30 min resistant to incipient spread of fire system ***or*** • Complying with AS 1530.8.2 when tested from the outside
Sub-floor (posts, stumps, columns, etc)	**Enclosed+**		NR	NR	NR	NR	NR	NR
	Unenclosed		NR	• Non-combustible material, ***or*** • Bushfire-resisting timber			• Non-combustible material, or • Complying with AS 1530.8.1	• FRL of at least 30/–/– and non-combustible, ***or*** • Complying with AS 1530.8.2
Decks, steps, ramps and landings	**Enclosed+**		NR	• Wall enclosing sub-floor deck space first 400 mm from a horizontal surface is to be the same as for walls above • Supports – NR • Framing – NR • Decking – less than 300 mm from glazed element is to be - Non-combustible, ***or*** - Bushfire-resisting timber, ***or*** - Timber species from E1		• Walls enclosing subfloor deck space - Non-combustible, ***or*** - Bushfire resisting timber, ***or*** - Mesh • Supports – NR • Framing – NR • Decking: - Non-combustible, ***or*** - Bushfire-resisting timber	• Walls enclosing subfloor deck space - Comply with external wall requirements, ***or*** - Mesh • Supports – NR • Framing – NR • Decking: - Non-combustible, ***or*** - Complying with AS 1530.8.1	• Walls enclosing subfloor deck space - Comply with external wall requirements, ***or*** - Mesh • Supports – NR • Framing – NR • Decking to have no gaps and be - Non-combustible, ***or*** - Fibre-cement sheet, ***or*** - Complying with AS 1530.8.2
	Unenclosed		NR	• Supports – NR • Framing – NR • Decking – less than 300 mm from glazed elements is to be - Non-combustible, ***or*** - Bushfire-resisting timber, ***or*** - Timber species from E1		• Supports - Non-combustible, ***or*** - Bushfire-resisting timber • Framing - Non-combustible, ***or*** - Bushfire-resisting timber • Decking - Non-combustible, ***or*** - Bushfire-resisting timber	• Supports - Non-combustible, or - Complying with AS 1530.8.1 • Framing - Non-combustible, or - Complying with AS 1530.8.1 • Decking - Non-combustible, or - Complying with AS 1530.8.1	• Supports - Non-combustible, ***or*** - Complying with AS 1530.8.2 • Framing - Non-combustible, ***or*** - Complying with AS 1530.8.2 • Decking - Non-combustible, ***or*** - Fibre-cement sheets, ***or*** - Complying with AS 1530.8.2
Balustrades, handrails			NR	NR	NR	• Greater than 125 mm from glazing or combustible wall or 0 mm from non-combustible wall – NR • Less than or equal to 125 mm from glazing or combustible wall - Non-combustible, ***or*** - Bushfire-resisting timber	• Greater than 125 mm from glazing or combustible wall or 0 mm from non-combustible wall – NR • Less than or equal to 125 mm from glazing or combustible wall - Non-combustible	• Greater than 125 mm from glazing or combustible wall or 0 mm from non-combustible wall – NR • Less than or equal to 125 mm from glazing or combustible wall - Non-combustible

NR – No requirement.
+ Wall enclosing sub-floor space to be of the same construction as for external walls OR with a mesh or perforated sheet used as a screen with a maximum 2 mm aperture made of (up to BAL–29) aluminum or (up to BAL–40) corrosion-resistant steel or bronze.
Note: Construction requirements required for a higher BAL can be used for a lower BAL e.g. BAL–FZ requirements can be used in BAL–40.

For further information visit www.woodsolutions.com.au and download Technical Design Guide #04 Building with Timber in Bushfire-prone Areas