



# Bushfire Hazard ASSESSMENT

**TOOWOOMBA REGIONAL COUNCIL**

**APPROVED DOCUMENT**

referred to in Council's Decision Notice dated

**18 May 2022**

This plan is subject to conditions of Approval Number

**RAL/2021/4607**

Assessment Manager

Lillybelle Park Pty Ltd

Fitton Road,  
Mt Rascal QLD 4350

Lot 656 SP200757 & Lot 100 SP317808

Prepared by Aquila NRM

November 2021

Project No: 210704

## DOCUMENT CONTROL RECORD

Title	Bushfire Hazard Assessment
Address	Fitton Road, Mt Rascal, QLD
Project Number	210704
Client	Lilybelle Park Pty Ltd

## DOCUMENT ISSUE

Issue	Date	Prepared By
1	26 October 2021	Rick Galbraith
2	1 November 2021	Rick Galbraith

### Disclaimer

This Bushfire Hazard Assessment has been undertaken using a number of bushfire hazard assessment methodologies including the Overall Fuel hazard Assessment Guide, the new methodology for state-wide mapping of bushfire-prone areas in Queensland and the guidelines set out in the Australian Standard "Construction of Buildings in Bushfire-prone Areas" (AS 3959-2018). It must be borne in mind that the measures dealt with in this assessment cannot guarantee that a building will survive a bushfire event. This is due mainly to the unpredictable nature and behaviour of fire and the difficulties associated with extreme weather conditions.

This assessment is based on site conditions prevailing at the time the inspection was undertaken. These conditions can and will change dependent on both weather conditions and the maintenance undertaken by property owners.

As site conditions can and will change over time this assessment is valid for a period of 24 months.

Bushfire Hazard Assessment prepared by



Rick Galbraith,  
Dip Horticultural Science  
EIANZ member  
1<sup>st</sup> November 2021

Aquila NRM  
7701 New England Highway  
Crows Nest Qld 4355

Ph: 0407 622 995  
Fax: 07 4698 2151  
Email: [aquilanrm@gmail.com](mailto:aquilanrm@gmail.com)



## Summary

A Bushfire Hazard Assessment was undertaken of the vegetation on and surrounding the proposed development site at Fittons Road, Mt Rascal, (Lots 656 SP200757 and 100 SP317808). This was to identify the level of bushfire hazard that individual lots on the site may be exposed to. A number of methodologies were utilised in the assessment including the “Overall Fuel hazard Assessment Guide” (Victorian State Government 2010), “A the new methodology for state-wide mapping of bushfire-prone areas in Queensland” (CSIRO 2014) and the Australian Standard “Construction of buildings in bushfire-prone areas” (AS 3959-2018) Method 2. Three lots were identified on the site as being potentially exposed to a Bushfire Attack Level (BAL) of 12.5, these being Lots 86, 87 and 191.

## General site details

The property is situated at: Fittons Road, Mt Rascal  
 Real Property description: Lots 656 SP200757 and 100 SP317808  
 Area of land: 96.9 hectares

The situated is situated in a developing rural residential area in Mount Rascal. Existing rural residential areas are present to the immediate north and northwest of the site. Mt Rascal Road is located on the western boundary of the site, Freyling Road on the south and Fittons Road to the east, a portion which is currently unformed. Limited areas of unmanaged and potentially hazardous are present to the south west of the site and to the east of Fittons Road in the vicinity of a watercourse. The structure of the vegetation present in these areas is open woodland with a grassy to shrubby understorey.

The following photographs show the nature of potentially hazardous vegetation adjacent to the site.



**Photo 1:** View to west from Mt Rascal Road of a limited area of unmanaged woodland vegetation.



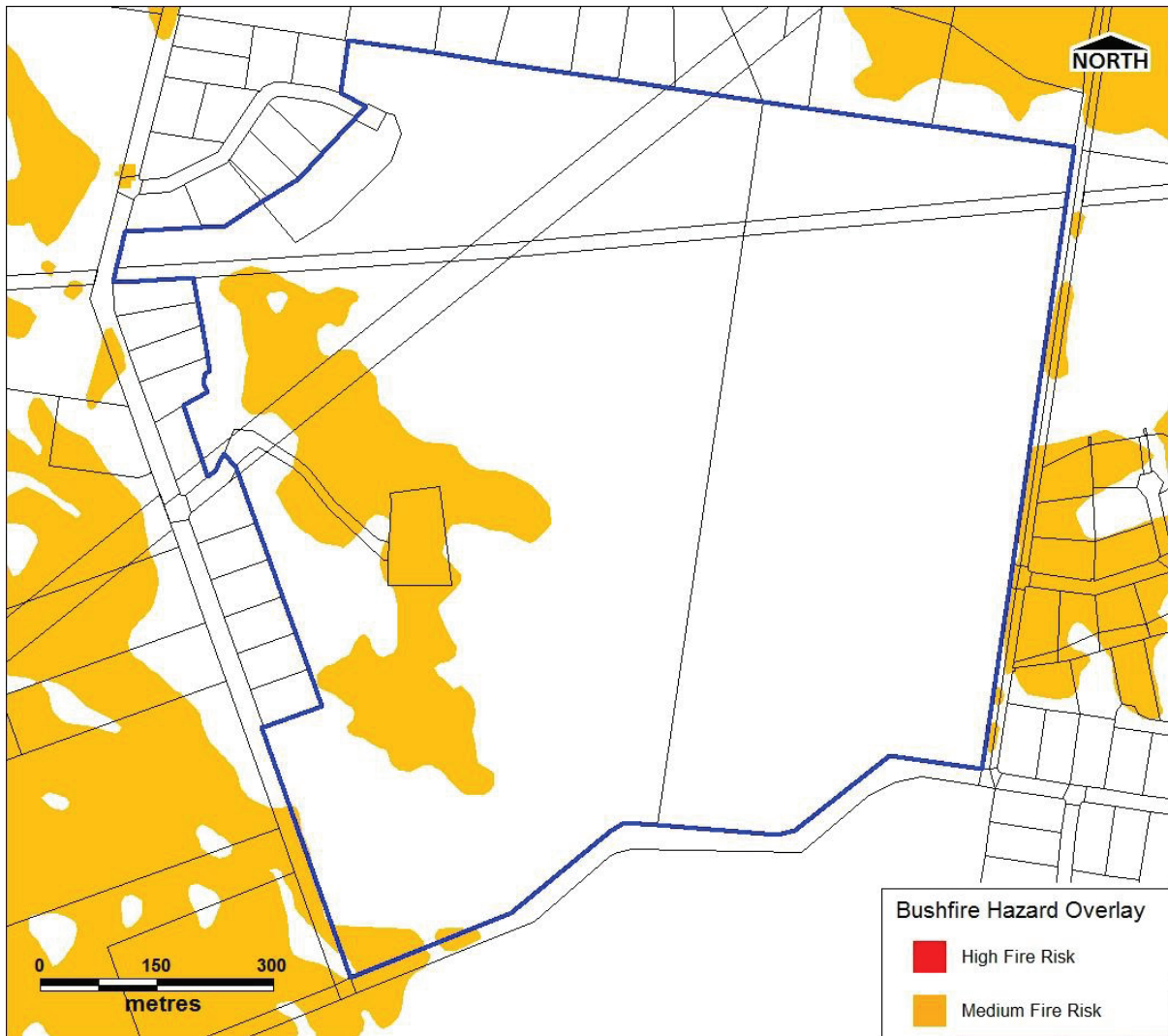
**Photo 2:** Vegetation on the banks of a watercourse to the east of Fittons Road



**Photo 3:** A limited area of grassy woodland vegetation is present to the east of Fittons Road.

### **Bushfire Hazard**

The site and immediate surrounding area is identified by the Toowoomba Regional Council Planning Scheme Bushfire Hazard Overlay mapping as containing areas of ‘*Bushfire hazard – medium risk.*’ The bushfire risk category for the site and surrounding area is shown in Figure 1.



**Figure 1:** Extent of bushfire hazard on the site and in nearby areas as identified by the Toowoomba Regional Council Bushfire Hazard Overlay mapping.

The site assessment identified limited areas of unmanaged and potentially hazardous vegetation to be present to the south west of the site and to the east of Fittons Road in the vicinity of a watercourse. The structure of the vegetation present in these areas is open woodland with a grassy to shrubby understorey. Appendix 1 Bushfire Hazard Assessment shows the location and extent of potentially hazardous vegetation that could contribute to elevated levels of bushfire hazard impacting on the site.

### **Determination of Bushfire Attack Level (BAL)**

The Bushfire Attack Level (BAL) that is likely to be experienced by a building in the event of a bushfire is determined by the type of vegetation present, its distance from the building and the slope of the site.

The following steps were carried out using information collected from the site and applying this information to the conditions required and set out in Australian Standard - Construction of buildings in bushfire-prone areas (AS 3595-2018). The Flamesol Method 2 online calculator (<http://flamesol.com.au/>) was used to identify the likely Bushfire Attack Level that buildings could be exposed to on the site. Lots 86, 87 and 191 that are bordered by Fittons Road were identified as being exposed to a BAL of 12.5. A summary of the parameters used to determine the Bushfire

Attack Level is provided in Table 1. Figures 2 and 3 provide the details of the Method 2 calculation of BAL's for areas to the southwest and east of the site.

**Table 1:** Parameters used for determining Bushfire Attack Level (BAL)

Step	Procedure	Value
1	Fire Danger Index (FDI)	40
2	Classification of vegetation type	B-05
3	Distance of Classified vegetation from the building site	>26m*
4	Location of vegetation (Upslope/Downslope)	Downslope
5	Effective slope of land under classified vegetation	6 degrees
6	Vegetation Hazard Class (VHC)	11.2
7	Total surface and near surface fuel load	11.5 t/ha
8	Overall fuel load	13.0 t/ha
9	Determination of BAL from Table 2.7 AS 3959-2018	BAL-12.5

Appendix 2 provides a summary of the construction requirements for Bushfire Attack Levels as per AS 3959-2018 (Amdt No. 1) Construction of buildings in bushfire-prone areas.



Calculated October 26, 2021, 1:29 pm (MDc v.4.9)

**Mount Rascal Road, Mt Rascal**

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	70	Rate of spread	1.46 km/h
Vegetation classification	Woodland	Flame length	11.05 m
Understorey fuel load	11.5 t/ha	Flame angle	58 °, 69 °, 77 °, 82 °, 84 ° & 90 °
Total fuel load	13 t/ha	Elevation of receiver	3.75 m, 3.89 m, 3.5 m, 2.75 m, 2.22 m & 0 m
Vegetation height	n/a	Fire intensity	9,815 kW/m
Effective slope	6 °	Transmissivity	0.879, 0.863, 0.841, 0.8159999999999999, 0.803 & 0.736
Site slope	6 °	Viewfactor	0.5911, 0.438, 0.2966, 0.2011, 0.1631 & 0.0445
Flame width	100 m	Minimum distance to < 40 kW/m <sup>2</sup>	8.800000000000001 m
Windspeed	n/a	Minimum distance to < 29 kW/m <sup>2</sup>	12 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m <sup>2</sup>	17.8 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m <sup>2</sup>	25.9 m
		Minimum distance to < 10 kW/m <sup>2</sup>	31.2 m

**Figure 2:** AS3959-2018 Method 2 Flamesol calculations for the south western side of site.



Calculated October 26, 2021, 1:26 pm (MDC v.4.9)

**Fittons Road, Hodgson Vale**

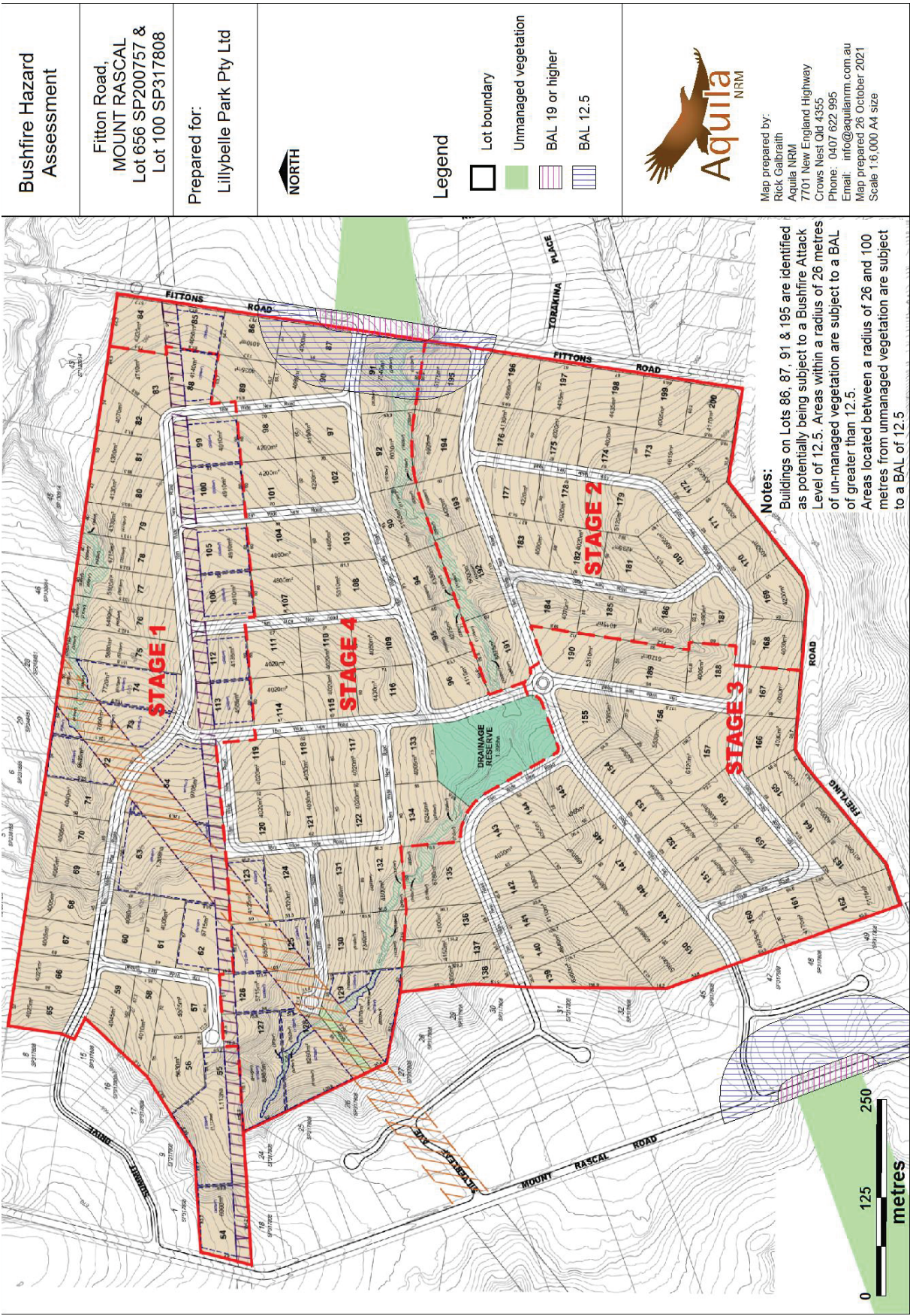
Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	70	Rate of spread	1.46 km/h
Vegetation classification	Woodland	Flame length	11.05 m
Understorey fuel load	11.5 t/ha	Flame angle	57 °, 68 °, 76 °, 81 °, 83 ° & 88 °
Total fuel load	13 t/ha	Elevation of receiver	3.85 m, 4.06 m, 3.79 m, 3.18 m, 2.75 m & 0 m
Vegetation height	n/a	Fire intensity	9,815 kW/m
Effective slope	6 °	Transmissivity	0.879, 0.863, 0.841, 0.8159999999999999, 0.803 & 0.736
Site slope	5 °	Viewfactor	0.5958, 0.4406, 0.296, 0.2007, 0.1634 & 0.0445
Flame width	100 m	Minimum distance to < 40 kW/m <sup>2</sup>	8.800000000000001 m
Windspeed	n/a	Minimum distance to < 29 kW/m <sup>2</sup>	12 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m <sup>2</sup>	17.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m <sup>2</sup>	26 m
		Minimum distance to < 10 kW/m <sup>2</sup>	31.2 m

**Figure 3:** AS3959-2018 Method 2 Flamesol calculations for the eastern side of site.

### Recommendations

That an assessment be undertaken of Lots 86,87,91 and 195 prior to the construction of individual dwelling on them to verify the Bushfire Attack Level that they are exposed to in accordance with the requirements of AS3959-2018 Construction of buildings in bushfire-prone areas, or its equivalent.

Appendix 1 – Bushfire Hazard Assessment



## Appendix 2 – AS3959-2018 Summary of Building requirements

Building Element		BAL-LOW	BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ
Roof	Tiled	NR	<ul style="list-style-type: none"> <li>Fully sarked (Flammability Index not more than 5)</li> <li>Installed directly below tile battens</li> <li>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.</li> </ul>				
	Sheet	NR	<ul style="list-style-type: none"> <li>Fully sarked (Flammability Index not more than 5)</li> <li>Foil-backed insulation blankets may be installed over battens</li> <li>Have any gaps sealed with –</li> <li>Mesh or perforated sheet used as a screen with a maximum 2 mm aperture made of corrosion-resistant steel, bronze or aluminum, or</li> <li>Mineral Wool, or</li> <li>Other non-combustible material</li> </ul>				<ul style="list-style-type: none"> <li>Constructed in accordance with AS 3959 Appendix H, or</li> <li>System complies with AS 1530.8.2 when tested from the outside</li> </ul>
Fascia & bargeboards		NR	NR	NR	<ul style="list-style-type: none"> <li>Bushfire-resisting timber</li> <li>Metal fixed at 450 mm centres</li> </ul>	<ul style="list-style-type: none"> <li>Complying with AS 1530.8.1</li> </ul>	<ul style="list-style-type: none"> <li>Complying with AS 1530.8.2</li> </ul>
Eaves linings		NR	NR	NR	<ul style="list-style-type: none"> <li>4.5 mm fibre-cement</li> <li>Bushfire-resisting timber</li> </ul>	<ul style="list-style-type: none"> <li>6 mm fibre-cement</li> <li>6 mm calcium silicate</li> </ul>	<ul style="list-style-type: none"> <li>FRL – /30/30, or</li> <li>Complying with AS 1530.8.2</li> </ul>
Windows		NR	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber-framed window) or</li> <li>Behind screens (any timber-framed window), or</li> <li>Less than 400 mm off horizontal surface</li> <li>Flame-protected timber or</li> <li>Timber species from E2</li> <li>Glazing: 4 mm Grade A safety and openable part screened</li> <li>Greater than 400 mm off horizontal surface</li> <li>annealed glass</li> <li>screens to openable parts of window</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber-framed window), or</li> <li>Behind screens (any timber-framed window), or</li> <li>Less than 400 mm off horizontal surface</li> <li>Flame-protected timber or</li> <li>Timber species from E2</li> <li>Glazing: 5 mm toughened glass and externally screened</li> <li>Greater than 400 mm off horizontal surface</li> <li>annealed glass</li> <li>screens to openable parts of window</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber-framed window), or</li> <li>Windows</li> <li>Glazing:                             <ul style="list-style-type: none"> <li>5 mm toughened glass and if less than 400 mm from a horizontal surface and externally screened</li> <li>Screens to openable parts of window</li> </ul> </li> <li>Frames: metal</li> <li>Seals: Flammability Index not more than 5</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside - any timber-framed window), or</li> <li>Window system having FRL of /30/- and screens to openable part of window, or</li> <li>Window system complying with AS 1530.8.2 and the openable part of the window screened</li> </ul>	
External Doors	Side hung	NR	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber door), or</li> <li>Behind screens (any timber door), or</li> <li>Un glazed Door</li> <li>Joinery</li> <li>Non-combustible or</li> <li>Solid, laminated or reconstituted timber having minimum thickness of 35 mm for the lower 400 mm or</li> <li>Timber hollow core with a non-combustible kickplate for the lower 400 mm</li> <li>Glazed door</li> <li>Glazing: as per windows</li> <li>Joinery less than 400 mm from a horizontal surface:                             <ul style="list-style-type: none"> <li>Bushfire-resisting timber or</li> <li>Timber species from E2</li> </ul> </li> <li>Door frame/jamb</li> <li>Less than 400 mm from a horizontal surface</li> <li>Bushfire-resisting timber or</li> <li>Timber species from E2</li> <li>Greater than 400 mm from a horizontal surface - NR</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber door), or</li> <li>Behind screens (any timber door), or</li> <li>Un glazed Door</li> <li>Joinery</li> <li>Non-combustible, or</li> <li>Solid, laminated or reconstituted timber having minimum thickness of 35 mm, or</li> <li>Glazed door</li> <li>Glazing: 6 mm toughened glass and externally screened</li> <li>Joinery: Bushfire-resisting timber</li> <li>Door frame/jamb: Bushfire resisting timber</li> </ul>	<ul style="list-style-type: none"> <li>Behind non-combustible bushfire shutters (any timber door), or</li> <li>Un glazed Door</li> <li>Joinery                             <ul style="list-style-type: none"> <li>Non-combustible, or</li> <li>Solid, laminated or reconstituted timber having minimum thickness of 35 mm, with lower 400 mm screened with a mesh</li> </ul> </li> <li>Glazing: 6 mm toughened glass and externally screened</li> <li>Joinery: Non-combustible</li> <li>Door frame/jamb: Metal</li> <li>Seals: Flammability Index not more than 5</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside - any timber door) or</li> <li>Door system complying with AS 1530.8.2</li> <li>(Note: Seals are not to compromise performance)</li> </ul>	
		Sliding door	NR	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber-framed door), or</li> <li>Behind screens (any timber-framed door), or</li> <li>Glazed door: 5 mm toughened glass</li> <li>4 mm thickness</li> <li>Joinery less than 400 mm from a horizontal surface</li> <li>Bushfire-resisting timber or</li> <li>Timber species from E1</li> <li>Joinery greater than 400 mm from a horizontal surface - NR</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (any timber-framed door), or</li> <li>Behind screens (any timber-framed door), or</li> <li>Glazed door: 5 mm toughened glass</li> <li>Flamed door, or</li> <li>Joinery less than 400 mm from a horizontal surface</li> <li>Bushfire-resisting timber or</li> <li>Timber species from E1</li> <li>Joinery greater than 400 mm from a horizontal surface - NR</li> </ul>	<ul style="list-style-type: none"> <li>Behind bushfire shutters (shutters complying with AS 1530.8.2 when tested from the outside - any timber-framed door) or</li> <li>Door system having FRL of /30/-, or</li> <li>Door system complying with AS 1530.8.2</li> </ul>	

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.



(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.)

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

**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.)*



Building Element		BAL-LOW	BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ
External Walls	Cladding	NR	Any cladding within 400 mm from a horizontal surface • Non-combustible material <b>or</b> • Fibre-cement sheet minimum 6 mm thickness <b>or</b> • Bushfire-resisting timber <b>or</b> • Timber logs, gauge planed, with minimum: - Density 680 kg/m <sup>3</sup> ; <b>and</b> - 90 mm nominal overall thickness; <b>and</b> - 70 mm thickness at interface of two logs	NR	• Fibre-cement minimum 6 mm thickness <b>or</b> • steel sheet <b>or</b> • bushfire-resisting timber <b>or</b> • timber logs, gauge planed, with minimum: - Density 680 kg/m <sup>3</sup> ; <b>and</b> - 90 mm nominal overall thickness; <b>and</b> - 70 mm thickness at interface of two logs	• Fibre-cement minimum 9 mm thickness <b>or</b> • steel sheet <b>or</b> • a system complying with AS 1530.8.1	• A system complying with AS 1530.8.2 when tested from outside; <b>or</b> • A system with an FRL of 30/30/30 <b>or</b> /30/30 when tested from outside  <i>Note: Fire-rated, timber-clad wall systems can achieve this performance requirement.</i>
	Light-weight	NR	NR	NR	NR	NR	NR
Floors (bearers, joists, flooring)	Framing members	NR	NR	NR	NR	NR	NR
	Enclosed+ Unenclosed	NR	NR	NR	NR (Includes mesh walls)	NR	NR
Sub-floor (posts, stumps, columns, etc)	Enclosed+	NR	NR	NR	NR	NR	NR
	Unenclosed	NR	• Non-combustible material, <b>or</b> • Bushfire-resisting timber	NR	NR	• Non-combustible material, <b>or</b> • Complying with AS 1530.8.1	• FRL of at least 30/-/- and non-combustible, <b>or</b> • 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, <b>or</b> - Bushfire-resisting timber, <b>or</b> - Timber species from EI	• Wall enclosing sub-floor deck space - Non-combustible, <b>or</b> - Mesh - Bushfire resisting timber, <b>or</b> • Supports - NR • Framing - NR • Decking - NR - Non-combustible, <b>or</b> - Bushfire-resisting timber	• Walls enclosing subfloor deck space - Comply with external wall requirements, <b>or</b> - Mesh - Supports - NR • Framing - NR • Decking - NR - Non-combustible, <b>or</b> - Fibre-cement sheet, <b>or</b> - Complying with AS 1530.8.2	• Walls enclosing subfloor deck space - Comply with external wall requirements, <b>or</b> - Mesh - Supports - NR • Framing - NR • Decking - NR - Non-combustible, <b>or</b> - Fibre-cement sheet, <b>or</b> - Complying with AS 1530.8.2	• FRL of at least 30/30/30 and non-combustible surface material, <b>or</b> • Timber flooring members must have the underside lined with a non-combustible material (eg fibre-cement or metal sheet), <b>or</b> • Complying with AS 1530.8.2 when tested from the outside
	Unenclosed	NR	• Supports - NR • Framing - NR • Decking - less than 300 mm from glazed elements is to be - Non-combustible, <b>or</b> - Bushfire-resisting timber, <b>or</b> - Timber species from EI	• Supports - Non-combustible, <b>or</b> - Bushfire-resisting timber	• Supports - Non-combustible, <b>or</b> - Framing - Non-combustible, <b>or</b> - Bushfire-resisting timber • Decking - Non-combustible, <b>or</b> - Bushfire-resisting timber	• Supports - Non-combustible, <b>or</b> - Framing - Non-combustible, <b>or</b> - Decking - Complying with AS 1530.8.1 - Non-combustible, <b>or</b> - Complying with AS 1530.8.2	• Supports - Non-combustible, <b>or</b> - Framing - Non-combustible, <b>or</b> - Decking - 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, <b>or</b> - 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) aluminium 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.