

Construction in Bushfire Zones

EXCL NSW AND SA

USING BORAL TIMBER PRODUCTS AS AT **FEBRUARY 2012**



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Boral Timber has full Chain of Custody certification which meets the Australian Forestry Standard (AFS) AS 4707-2006.

With products that are certified to the Australian Forestry Standard (AFS), consumers can rest assured that the timber used for their hardwood flooring, decking, hardwood or softwood structural framing, plywood and furniture has been sourced from certified, legal and sustainably managed resources.

Future generations can breathe easy knowing that the timber being harvested and regrown today provides a positive contribution to environmental challenges in the future.

Chain of Custody tracks a forest or wood product from its origin in a certified forest, through to its end use by the consumer. The AFS Chain of Custody certification verifies that Boral Timber products are produced from certified, legal and sustainable resources.

The Australian Forestry Certification Scheme (AFCS) has been developed to promote sustainable forestry management specifically for the Australian environment. The AFS is the only chain of custody certification that is an Australian Standard (AS4707-2006). The AFCS has mutual recognition by the Program for the Endorsement of Forestry Certification (PEFC), the world's largest forest management certifier.



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Promoting sustainable forest management

Simplified Bushfire Standard Complying Timber Construction

An Australian Standard AS 3959 specifically relating to the construction of buildings in bush-fire prone areas now applies in all parts of Australia.

This brochure provides an easy reference guide for acceptable timber construction in bushfire prone areas throughout Australia except NSW and SA (refer to Boral Timber's specific brochures for these States) using Boral Timber products.

It is recommended the information provided in this brochure is used in conjunction with AS 3959 Construction of Building in Bushfire prone area.

The following information has been developed by the Timber Development Association on behalf of Boral Timber as a guide to meeting the different construction requirements using Boral Timber products. For further technical assistance please contact Boral Timber on 1800 818 37 or contact the Timber Development Association on 02 8424 3700.

Bushfire Attack Levels (BAL) under the Australian Standard

The AS 3959 Construction of building in Bushfire prone areas standard has 6 levels of risk of bushfire attack; these levels are referred to as Bushfire Attack Levels (BAL). A BAL is a mean of measuring the severity of a building's potential exposure to a bushfire.

The 6 levels of exposure in AS 3959 being BAL Low, BAL 12.5, 19, 29, 40 and FZ. As the BAL number increases the severity of bushfire attack from embers, radiant heat and direct flame contact also increases.

The number associated with the BAL represents the maximum radiant heat expressed in kilowatts per metre squared the building surface is assumed to be exposed too.

Severity of a bushfire fire or BAL is influenced by the Forest Fire Danger Index, vegetation type, slope of land under the vegetation and distance the building is away from the vegetation.

The standard uses the BAL as the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire. It is necessary to determine the BAL's before using the prescribed construction requirements detailed in this brochure.

Bushfire Attack Exposure under the Australian Standard 3959-2009 ¹	Description of the predicted Bushfire Attack Levels
BAL - LOW	Low risk of bushfire attack does not warrant specific construction requirements.
BAL - 12.5	Possibility of ember attack.
BAL - 19	Increasing level of predicted ember attack and burning debris ignited by windborne embers together with increasing heat flux not greater than 19kW/m ² .
BAL - 29	Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux not greater than 29kW/m ² .
BAL - 40	Increasing levels of ember attack and burning debris ignited by windborne embers, together with increasing heat flux not greater than 40kW/m ² and increased likelihood of exposure to flames.
BAL - FZ	Direct exposure risk to flames from a fire front, ember attack and heat flux over 40kW/m ² .

¹ To ascertain which BAL zone a property falls under (as outlined in AS 3959-2009) a site assessment should be conducted by an experienced architect, building designer or builder.

Stairs, decks and ramps

Stairs, decks and ramps					
Building Element	Subfloor Space	BAL -12.5 and BAL -19	BAL -29	BAL -40	BAL -FZ
Wall enclosing subfloor space.	Enclosed	<p>Less than 400mm from the ground or an external horizontal surface¹ use Boral structural hardwood or softwood timber framing provided the framing is clad with non-combustible material such as bushfire-resisting timber² such as Boral Timber hardwood cladding in Blackbutt or Spotted Gum species or timber with density of 750kg/m³ or greater, or fibre cement.</p> <p>400mm or more above the ground there are no construction requirements any timber, such as Boral structural hardwood or softwood, can be used⁴.</p>	Boral structural hardwood or softwood timber framing provided the framing is clad with bushfire-resisting timber ² , such as Boral Timber hardwood cladding in Blackbutt or Spotted Gum species, or with a non combustible material.	Boral structural hardwood or softwood timber framing provided the framing is clad with non-combustible clad, i.e. masonry or min 9mm fibre cement.	Boral structural hardwood or softwood timber framing provided the framing is clad with masonry, brick or concrete veneer min 90mm thick, or forms part of a lightweight cladding wall system with a min FRL 30/30/30 (i.e. Boral OutRwall® system OW16WF10).
Subfloor supports (posts, stumps, columns, stair stringers etc).	Enclosed	Boral structural hardwood or softwood timber ⁴ .			
	Open	Boral F27/F17 hardwood or softwood structural timber ⁴ .	Bushfire resisting timber ² such as Boral F27 structural timber in Blackbutt species.	Metal or brick	
Deck/ramp bearers and joists.	Enclosed	Boral F27/F17 hardwood or softwood structural timber ⁴ .			
	Open	Boral F27/F17 hardwood or softwood structural timber ⁴ .	Bushfire resisting timber ² such as Boral F27 structural timber in Blackbutt species.	Metal	
Decking and Stair treads.	Enclosed	Boral decking ⁴ except where 300mm or less from glazed elements (see Figure 1 to Figure 2).	Bushfire resisting timber ² such as Boral decking ⁴ in Blackbutt or Spotted Gum species.	Tiled or concrete decks.	
	Open				
Balustrades and Handrails.		<p>Less than 125mm from any glazing or any combustible wall handrails and balustrades shall be made from non-combustible material.</p> <p>125mm or more from the building handrails and balustrades have no requirements.</p>			

Figure 1: Plan view – mixed material decking solution

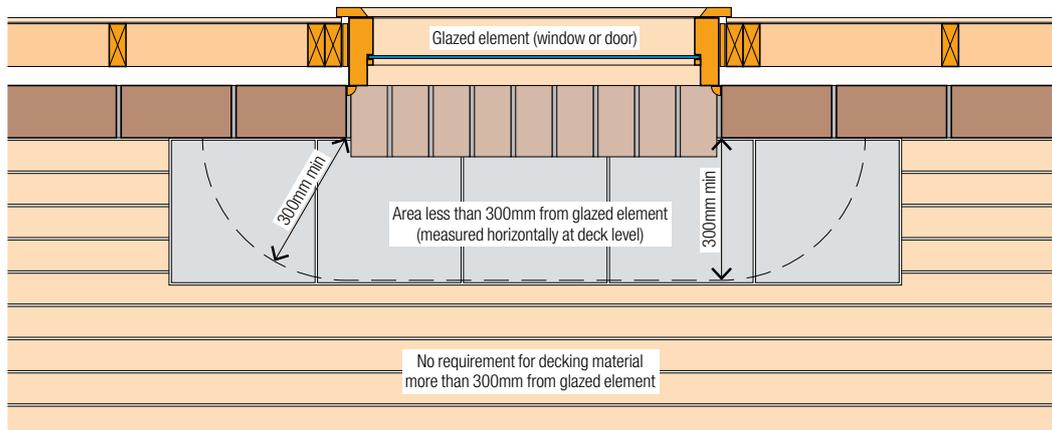
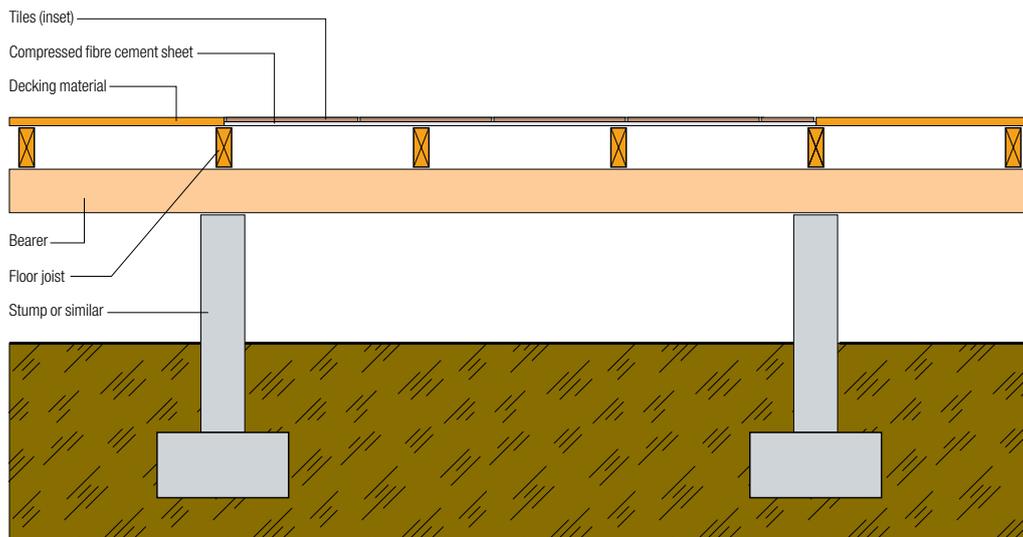
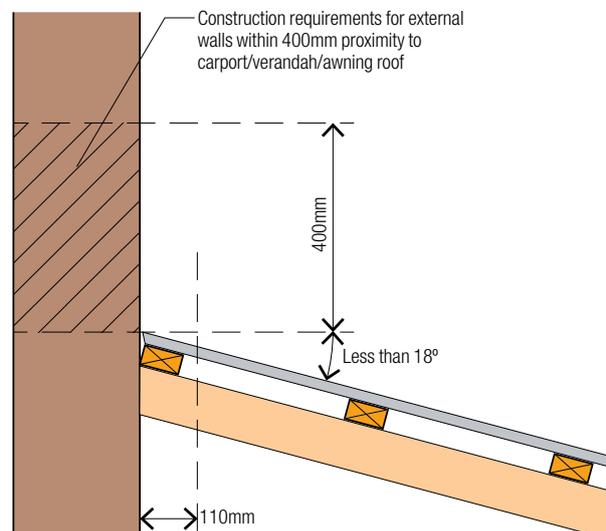


Figure 2: Elevation view – mixed material decking solution



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 110mm in width from the wall or window or door. See right.
2. Bushfire resisting timber species include Blackbutt and Spotted Gum.
3. Timber species with density of 750kg/m³ or greater, is a timber's density at 12 percent moisture content. Suitable timber species available from Boral Timber can be found in the Boral Timber Species Quick Reference Guide found on www.boral.com.au/timber.
4. Durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt with in this guide.



Elevated Floors/Subfloors

Elevated Floors/Subfloors					
Building Element	Subfloor Space	BAL -12.5 and BAL -19	BAL -29	BAL -40	BAL -FZ
Wall enclosing subfloor space.	Enclosed	<p>Less than 400mm above the ground or an external horizontal surface¹, use Boral structural hardwood or softwood timber framing provided the framing is clad with non-combustible material, such as bushfire-resisting timbers², such as Boral Timber hardwood cladding in Blackbutt or Spotted Gum species or timber with density of 750kg/m² or greater³ (Refer Figure 3), or fibre cement.</p> <p>400mm or more above the ground there are no construction requirements any timber such as Boral structural hardwood or softwood can be used⁴.</p>	Boral structural hardwood or softwood timber framing provided the framing is clad with bushfire-resisting timber ³ , such as Boral Timber hardwood cladding in Blackbutt or Spotted Gum species, or a non combustible material.	Boral structural hardwood or softwood timber framing provided the framing is clad with non-combustible clad, i.e. masonry or min 9mm fibre cement.	Boral structural hardwood or softwood timber framing provided the framing is clad with masonry, brick or concrete veneer min 90mm thick, or forms part of a lightweight cladding wall system with a min FRL 30/30/30 (i.e. Boral OutRwall® system OW16WF10).
Subfloor supports (posts, stumps, columns, stair stringers etc).	Enclosed	Boral structural hardwood or softwood timber ⁴			
	Open	Boral structural hardwood or softwood timber ⁴ .	Bushfire resisting timber ² such as Boral F27 structural timber in Blackbutt species.	Brick, steel or concrete stumps.	
Bearers and joists.	Enclosed	Boral F27/F17 hardwood or softwood structural timber ⁴ .			
	Open	Boral F27/F17 hardwood or softwood structural timber ⁴ .	<p>Less than 400mm above the ground use Bushfire-resisting timbers², such as Boral F27 structural timber in Blackbutt species, or line the underside of the floor framing with fibre cement or sheet metal (roofing).</p> <p>400mm or more above the ground there are no construction requirements. Boral F27/F17 hardwood or softwood structural timber⁴ can be used⁴.</p>	Boral F27/F17 hardwood or softwood structural timber ⁴ 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. Refer Figure 4.	Boral F27/F17 hardwood or softwood structural timber ⁴ provided it is protected from below by a fire rated ceiling system with min FRL 30/30/30 (i.e. Boral Plasterboard ceiling system C16F).
Flooring	Enclosed	Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry ⁴ .			
	Open	Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry ⁴ .	<p>Less than 400mm from the ground provided the underside is lined with Bushfire-resisting timbers², use Boral solid strip flooring, Boral overlay solid strip flooring and Boral parquetry in Blackbutt or Spotted Gum species, or with sarking or mineral wool.</p> <p>400mm or more above the ground there are no construction requirements, use Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry⁴.</p>	Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry 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. Refer Figure 4.	Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry provided it is protected from below by a fire rated ceiling system with min FRL 30/30/30 (i.e. Boral Plasterboard ceiling system C16F).

Figure 3: Enclosing subfloor BAL 12.5 and 19 only

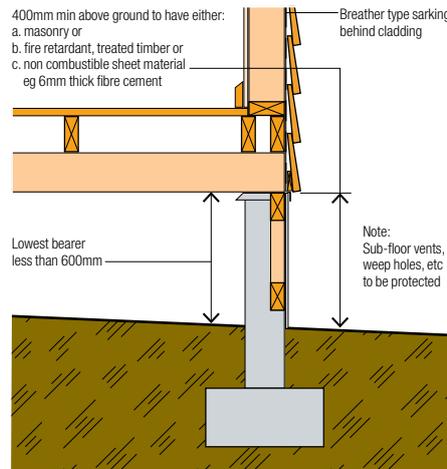
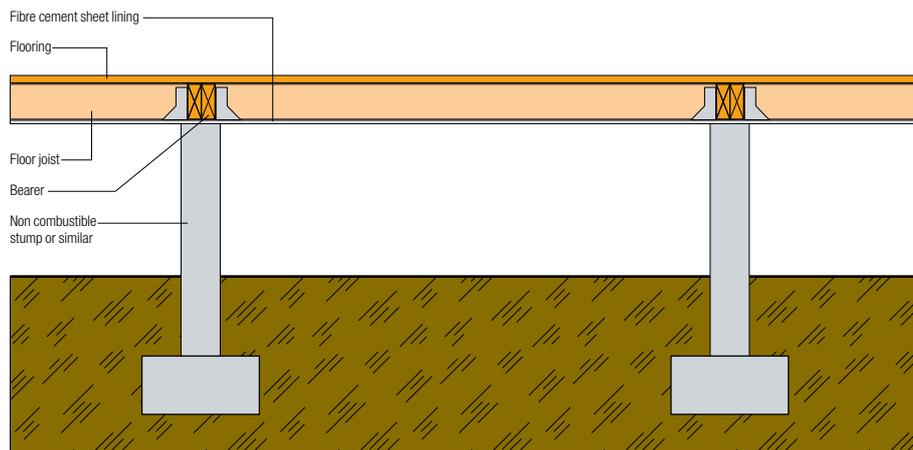
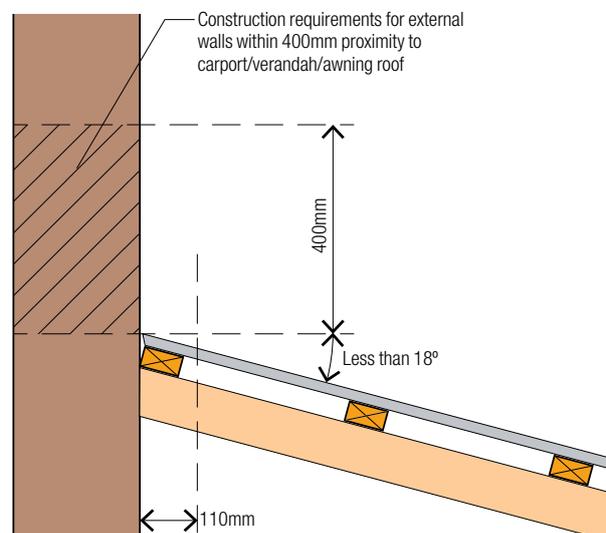


Figure 4: Underside of floor protected by fibre cement sheeting



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 110mm in width from the wall or window or door. See right.
2. Bushfire resisting timber species include Blackbutt, Spotted Gum and Red Ironbark.
3. Timber species with a density of 750kg/m³ or greater, is a timber's density at 12 percent moisture content. Suitable timber species available from Boral Timber can be found in the Boral Timber Species Quick Reference Guide found on www.boral.com.au/timber.
4. Durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt with in this guide.
5. FRL 30/30/30 refers to fire resistant level of 30 minutes.

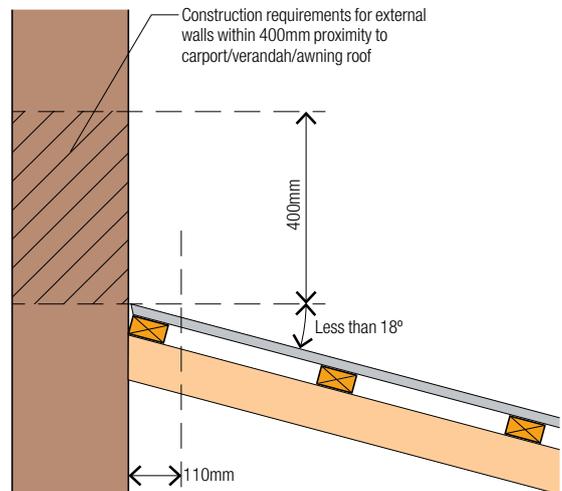


External Walls

External Walls				
Building Element	BAL-12.5 and BAL-19	BAL-29	BAL-40	BAL-FZ
External Wall Surface	<p>Less than 400mm above the ground or an external horizontal surface¹, use Boral hardwood cladding timber with density of 750kg/m³ or greater³, bushfire-resisting timbers² such as Blackbutt or Spotted Gum or with non-combustible material, refer Figure 3.</p> <p>400mm or more above the ground or an external horizontal surface¹ there are no construction requirements: Boral hardwood cladding can be used⁴.</p>	Bushfire-resisting timber cladding such as Blackbutt and Spotted Gum. Sarking required between cladding and framework.	Non-combustible clad, i.e. masonry or min 9mm fibre cement	Wall surface made of non combustible material (e.g. masonry, brick veneer, concrete etc) with a min of 90mm thickness or an FRL -/30/30 when tested from outside (i.e. Boral OutRwall® system OW16WF10) or bushfire resistant to AS 1530.8.2.
External Wall Framing	Boral structural hardwood or softwood timber ⁴ .		Boral structural hardwood or softwood timber ⁴ framing provided the framing is clad with non-combustible clad, i.e. masonry or min 9mm fibre cement.	Boral structural hardwood or softwood timber ⁴ provided the external wall as above.

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 110mm in width from the wall or window or door. See right.
2. Bushfire resisting timbers include Blackbutt and Spotted Gum.
3. Timber species with a density of 750 kg/m³ or greater, is a timber's density at 12 percent moisture content. Suitable timber species available from Boral Timber can be found in the Boral Timber Species Quick Reference Guide found on www.boral.com.au/timber.
4. Durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt with in this guide.



Internal Surfaces

Internal Surfaces	
Flooring; T&G and overlays	Boral solid strip flooring, Boral overlay solid strip flooring and Boral Parquetry.
Ceiling Linings	Any timber ¹
Stair cases	Boral structural hardwood timber ¹ .
Joinery	Boral structural hardwood timber ¹ .

NOTES:

1. Durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt with in this guide.

Roof Framing

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 .	Boral structural hardwood or softwood timber ¹ .			Boral structural hardwood or softwood timber ¹ provided framing is part of a roof system as outlined in Wood Solutions Guide 04 ³ .

Framing for Roofed Structures like Verandas, Garages and Carports

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 is separated from the building by a fire rated FRL 60/60/60 ³ wall (i.e. Boral Plasterboard Partiwall [®] system) that extends to the underside of a non-combustible roof covering ² .	Boral structural hardwood or softwood timber ¹ .			Boral structural hardwood or softwood timber ¹ provided framing is part of a roof system as outlined in Wood Solutions Guide 04 ⁴ .
Where the roof of an attached structure is separated from the roof space of the main building by a masonry veneer wall, 90mm thick.	Boral structural hardwood or softwood timber ¹ .			

NOTES:

1. Durability, strength and appearance need to be considered in addition to bushfire requirements. These issues are not dealt with in this guide.
2. 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.
3. FRL 60/60/60 refers to fire resistant level of 60 minutes.
4. Wood Solutions Guide 04: *Building with Timber in Bushfire prone Areas* is available for free on www.woodsolutions.com.au

Species quick reference guide

Species Name	Natural Durability Class		Fire						Products
	In-Ground Contact	Outside Above Ground Contact	Spread-of-Flame Index	Smoke-Developed Index	Critical Radiant Flux	Smoke Development Rate	Group Number	Naturally Bushfire-resisting timber	
Australian Beech*	3	3	5	3	>2.2 and <4.5	<750	3	Unknown	Flooring
Blackbutt	2	1	9	3	>2.2 and <4.5	<750	3	Yes	Flooring Decking Structural Cladding
Brushbox	3	3	3	2	>2.2 and <4.5	<750	3	Unknown	Flooring
Flooded (Rose) Gum	3	2	7	3	>2.2 and <4.5	<750	3	Unknown	Flooring
Forest Reds**	3	2			>2.2 and <4.5	<750	3	Unknown	Flooring Decking
Grey Ironbark	1	1	3	3	>2.2 and <4.5	<750	3	Unknown	Flooring Decking
Red Ironbark	1	1	5	3	>2.2 and <4.5	<750	3	Yes	Flooring
Jarrah	2	2	3	3	>2.2 and <4.5	<750	3	Unknown	Flooring Decking
Karri	3	2	7	3	>2.2 and <4.5	<750	3	Unknown	Flooring
Messmate	3	3	5	3	>2.2 and <4.5	<750	3	Unknown	Flooring
New England Oak (Manna Gum)	4	3			>2.2 and <4.5	<750	3	Unknown	Flooring Structural
Red Mahogany	2	1	6	3	>2.2 and <4.5	<750	3	Unknown	Flooring Decking
River Reds	3	2	7	3	>2.2 and <4.5	<750	3	Unknown	Decking
Spotted Gum	2	1	3	3	>2.2 and <4.5	<750	3	Yes	Flooring Decking
Stringybark***	3					<750		Unknown	Flooring Decking
Sydney Blue Gum	3	2			>2.2 and <4.5	<750	3	Unknown	Flooring
Tallowwood	1	1	5	4	>2.2 and <4.5	<750	3	Unknown	Flooring Decking
Tasmanian Oak	4	3	8	3	>2.2 and <4.5	<750	3	Unknown	Flooring
Turpentine	2	1	6	3	>2.2 and <4.5	<750	3	Yes	Flooring

A full overview of hardwood timber species can be found in the Boral Timber Species Quick Reference Guide found on www.boral.com.au/timber.

* Australian Beech: as this is a blend of species, provided properties are based on Messmate

** Forest Reds: as this is a blend of species, provided properties are based on Sydney Blue Gum

*** Stringybark: as this is a blend of species, provided properties are based on Diehard Stringybark

Information provided by the Timber Development Association.

Boral Timber Products

Boral Timber is one of the largest manufacturers of native Australian hardwood products. Boral Timber's products are produced at long established mills in central and northern New South Wales.

Boral Timber has become one of the largest suppliers of hardwood and softwood timber in Australia with a diverse product range encompassing flooring, decking, appearance grade timber (stairs and furniture), cladding, decorative and structural timbers.



Boral solid strip flooring

Precision milled with a tongue and groove profile that is also end-matched for a tight board-to-board fit and a continuous stable surface it provides a wear layer that can be refinished many times over. It is designed to be nailed down over bearers and joists or to battens on concrete.



Boral overlay solid strip flooring

Designed to be installed where there is no bearer and joist subfloor. Overlay flooring is installed over concrete, existing timber floors or plywood.



Boral Parquetry

Block parquetry can be laid in any pattern, using similar or contrasting blocks. Parquetry is designed to be laid over concrete or any flat, dry surface.



Boral decking

Australian hardwood decking is seasoned for Australian conditions and is ideal for pool surrounds, outdoor entertaining areas and even as fencing, seating or slat screening.



Boral structural hardwood

F17 and F27 seasoned hardwood is ideal for all structural applications including sub-floor construction, stair components, highly loaded truss members, wall lintels over openings and high strength structural beams.



Boral structural softwood

Kiln dried, accurately gauged and machine stress graded to ensure that they are dimensionally stable, straight and structurally reliable. Available untreated or treated (Pinegard Blue and Pinegard Red).



Boral hardwood cladding

Used for a wide range of applications including decorative exterior cladding; lightweight structures; residential, commercial and industrial buildings; and outdoor structures such as fences. Timber cladding provides an envelope that protects a building. Boral hardwood cladding is available in chamfer and shiplap profile.



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Disclaimer: This brochure is not intended to be 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. This document has been produced as a summary of the subject matter covered only and is not intended to be used as a substitute for professional advice, it is recommended that all designers and builders obtain appropriate expert advice specific to their particular construction circumstance.

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