

Fire Grade Plasterboard & Timber Systems

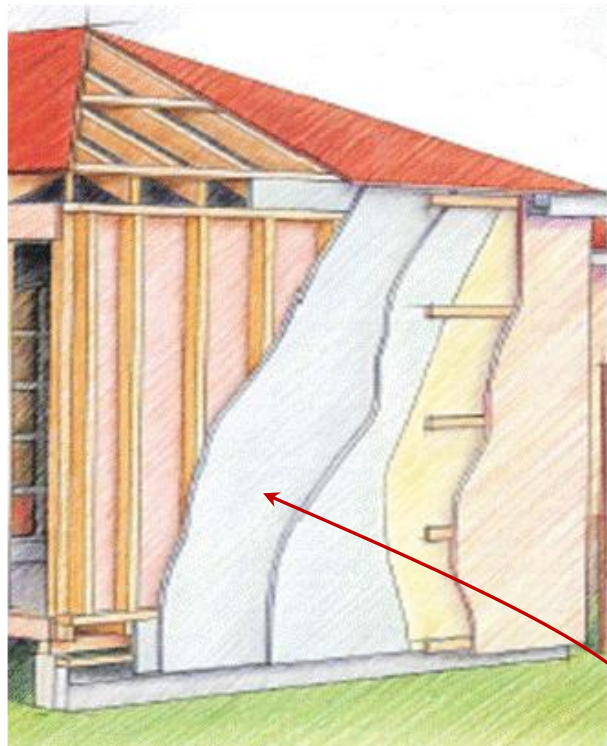
Home owners may wish to reconstruct their homes using a traditional, or modern, weatherboard look. Specific construction methods will be dependent on the required Bushfire Attack Level.

BAL- LOW	No special construction requirements
BAL- 12.5 & 19	Bushfire resistant or timber species listed in E1
BAL- 29	Bushfire resistant timber & sarking
BAL - 40 & FZ	FRL of 30/30/30 required – see fire rated plasterboard/timber systems

Note: Sarking-type material is recommended in all walls.

For BAL 40 and FZ, a minimum Fire Resistance Level (FRL) of 30/30/30 (structural adequacy / integrity / insulation) is required.

This requirement can be achieved utilising fire grade plasterboard & timber systems. Typical systems utilising just one layer of 16mm 'wet area' fire grade plasterboard can in fact achieve twice the required FRL i.e. 60/60/60 – higher FRL's can also be achieved if desired. It should be noted that a FRL of 60/60/60 is required on external walls onto which an external structure is attached e.g. carport.



One layer of 16 mm "wet area" fire grade plasterboard provides a FRL of 60/60/60;

Two layers of 16 mm "wet area" fire grade plasterboard provides a FRL of 90/90/90

Source: Boral Out/RWALL



A number of companies produce fire grade plasterboard for use as part of a timber system.

Typically though, the fire grade plasterboard is used on the outside of the timber wall studs - this effectively fire seals the home.

Any type of external lightweight cladding can then be fixed to battens attached to the fire grade plasterboard/timber walls. Detailing is important and as such installation is to be in accordance with the manufacturer's recommendations.

Further information on these systems can be found at:

Boral: www.plasterboard.boral.com.au

CSR: www.gyprock.com.au

For further information in Victoria contact: Wood Products Victoria, 03 9611 9044
Or visit <http://www.timber.org.au> and look under Design& Construction / Bushfire Performance
17Apr09

Timber Framed Housing in Bushfire-prone Areas

A wide range of timber solutions exist for construction in bushfire-prone areas



AS3959 – Construction of buildings in bushfire-prone areas

Australian Standard AS3959 *Construction of buildings in bushfire-prone areas* has now been implemented in Victoria (March 2009), and applies to all new houses.

AS3959 specifies the additional construction requirements for houses to improve their performance in the event of bushfire attack. It covers flooring systems, supports, external walls, windows, doors, vents, roofs, eaves, fascias, guttering, verandas, decks and service pipes.

Bushfire Attack Level	Description of predicted bushfire attack and levels of exposure
BAL- LOW	Insufficient risk to warrant specific construction requirements.
BAL- 12.5	Ember attack.
BAL- 19	Increasing level of ember attack and burning debris ignited by windborne embers together with increasing heat flux greater than 12.5 and up to 19 kWm ² .
BAL- 29	Increasing level of ember attack and burning debris ignited by windborne embers together with increasing heat flux greater than 19 and up to 29 kWm ² .
BAL- 40	Increasing level of ember attack and burning debris ignited by windborne embers together with increasing heat flux greater than 29 and up to 40 kWm ² with the increased likelihood of exposure to flames.
BAL- FZ	Direct exposure to flames from fire front in addition to heat flux greater than 40 kWm ² and ember attack.

AS3959 utilises six bushfire attack levels (BAL's) ranging from low to extreme risk (BAL-FZ) and provides construction requirements for each of these zones. The BAL takes into consideration a number of factors including the Fire Danger Index, the slope of the land, types of surrounding vegetation and its proximity to any building.

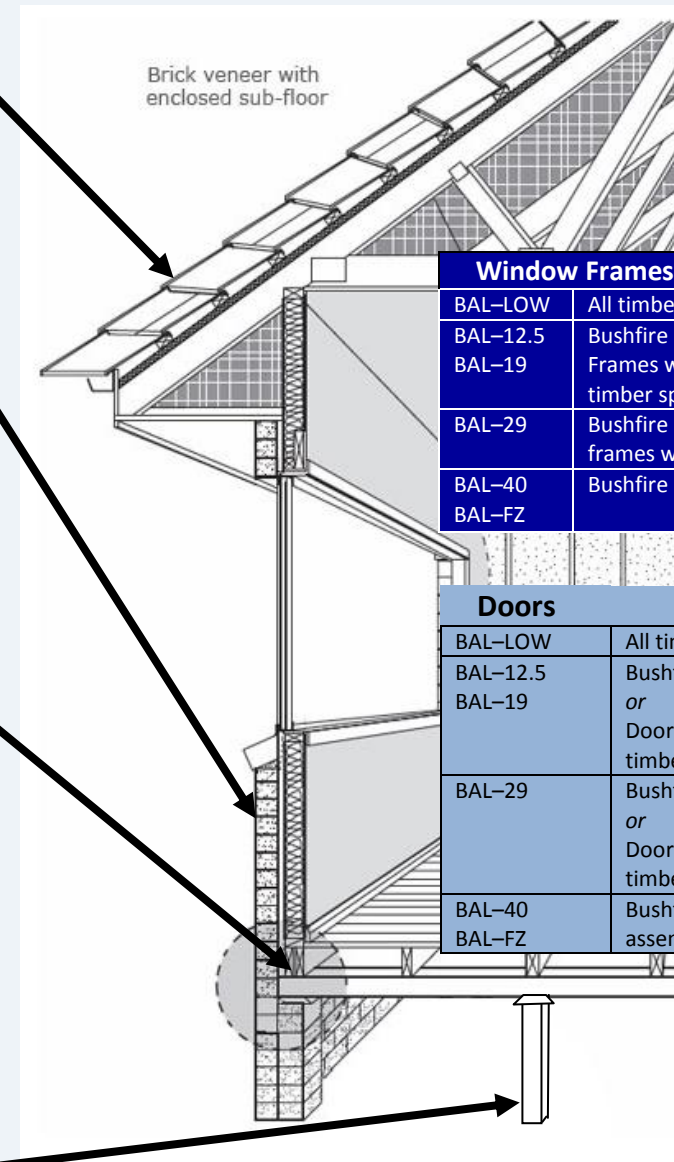
Traditional Timber Framing Methods

(To be used in conjunction with AS3959-2009)

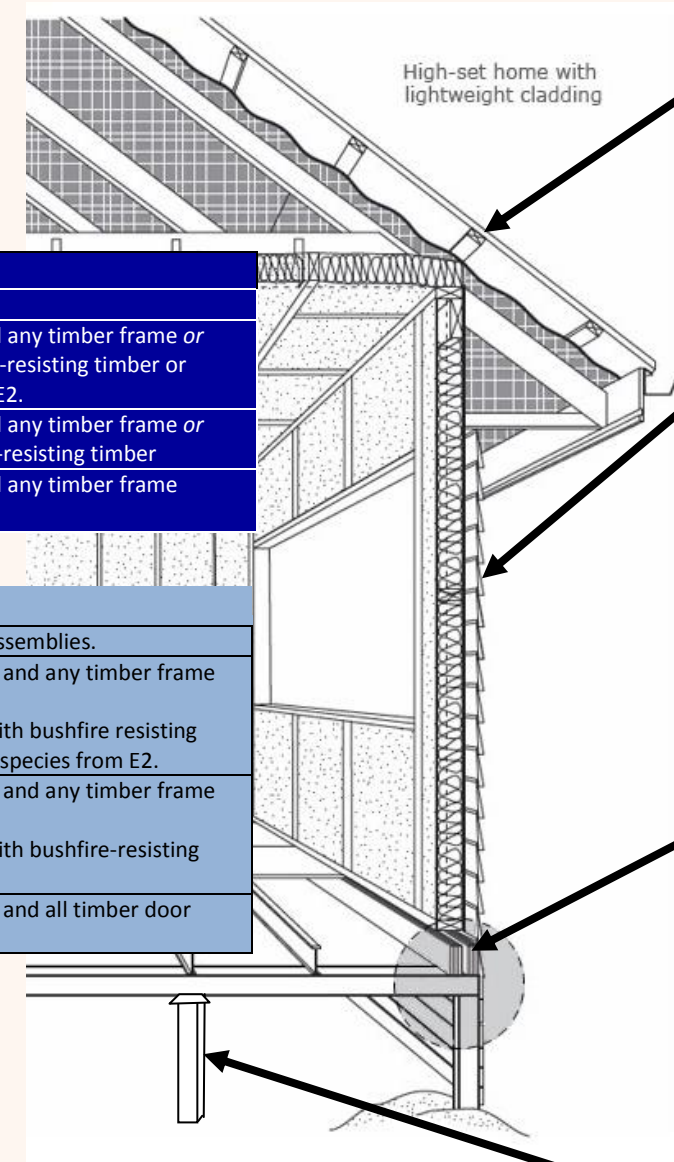
Roofs

BAL-LOW to BAL-40	Traditional timber roof framing. Non combustible covering (sheet or tiled roof). Roof fully sarked with no gaps at junctions e.g. fascia, gutters, valleys.
BAL-FZ	Tested system to comply with AS 1530.8.2. Roof systems currently being tested and evaluated - no solutions available for any building materials.

For Brick Veneer Homes



For Lightweight Homes



Roofs

BAL-LOW to BAL-40	Traditional timber roof framing. Non combustible covering (sheet or tiled roof). Roof fully sarked with no gaps at junctions e.g. fascia, gutters, valleys.
BAL-FZ	Tested system to comply with AS 1530.8.2. Roof systems currently being tested and evaluated - no solutions available for any building materials.

External wall cladding

All BALS	All traditional timber wall framing products are appropriate. Where walls are totally brick veneer, design and build as usual. Where light-weight cladding sections are used, for instance above windows and doors, take into account the "Lightweight Homes" BAL guidelines opposite.
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Window Frames

BAL-LOW	All timber frames.
BAL-12.5 BAL-19	Bushfire shutters and any timber frame or Frames with bushfire-resisting timber or timber species from E2.
BAL-29	Bushfire shutters and any timber frame or frames with bushfire-resisting timber
BAL-40 BAL-FZ	Bushfire shutters and any timber frame

External wall cladding⁺

BAL-LOW	Traditional timber and other lightweight cladding materials
BAL-12.5 BAL-19	Bushfire-resisting timber or timber species listed in E1
BAL-29	Bushfire-resisting timber and sarking
BAL-40 & BAL-FZ	FRL [^] of 30/30/30 required – see fire grade plasterboard/timber systems.

⁺Sarking material should be applied over wall frames prior to fixing of external cladding.
[^]FRL – Fire resistance level – structural adequacy / integrity / insulation (minutes)

Floors: bearers, joists, flooring - enclosed

All BALS	When the timber sub-floor is fully enclosed, all traditional timber sub-floor framing products are appropriate. Build as usual for the wall, floors and sub-floor supports.
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Insulation of the floor or the use of insulated particleboard sheeting will improve the energy rating (5 Star) while still giving the low embodied energy, comfort and cost advantages of a timber floor.

Doors

BAL-LOW	All timber door assemblies.
BAL-12.5 BAL-19	Bushfire shutters and any timber frame or Door assembly with bushfire resisting timber or timber species from E2.
BAL-29	Bushfire shutters and any timber frame or Door assembly with bushfire-resisting timber
BAL-40 BAL-FZ	Bushfire shutters and all timber door assemblies.

Floors: bearers, joists, flooring

Open, unenclosed sub-floor space	
BAL-LOW to BAL-19	Traditional timber framing and wood products
BAL-29	Bushfire-resisting timber, or particleboard or plywood flooring where the underside is lined with sarking or mineral wool insulation
BAL-40	Underside of timber floor lined with a non-combustible material (eg fibre cement or metal sheet)
BAL-FZ	Underside of timber floor system protected with a 30 minute resistance to incipient spread of fire.
Enclosed sub-floor space	
All BALS	When the timber sub-floor is fully enclosed, all traditional timber sub-floor framing products are appropriate. Build as usual for the wall, floors and sub-floor supports.

Insulation of the floor or an use of insulated particleboard sheeting will improve the energy rating (5 Star) while still giving the low embodied energy, comfort and cost advantages of a timber floor.

Sub-Floor Supports: posts, stumps, columns

Enclosed sub-floor space	
All BALS	When the timber sub-floor is fully enclosed, all traditional timber sub-floor framing products are appropriate. Build as usual for the wall, floors and sub-floor supports.

Ideal for sloping blocks where expensive and damaging cut and fill can be avoided, traditional timber framing gives low embodied energy for the building and an enclosed sub-floor, gives a better energy rating (5 Star).

Sub-Floor Supports: posts, stumps, columns

open, unenclosed	
BAL-LOW to BAL-19	Traditional timber framing and wood products
BAL-29	Bushfire-resisting timber
BAL-40	Non-combustible material (ie concrete stump)
BAL-FZ	FRL of at least 30/-/- and non-combustible,
Enclosed sub-floor space	
All BALS	When the timber sub-floor is fully enclosed, all traditional timber sub-floor framing products are appropriate. Build as usual for the wall, floors and sub-floor supports.

Ideal for sloping blocks where expensive and damaging cut and fill can be avoided, traditional timber framing gives low embodied energy for the building and an enclosed sub-floor, gives a better energy rating (5 Star).

Decks – open, unenclosed

BAL-LOW	Materials and building methods as usual in compliance with AS 1684-1999
BAL-12.5 BAL-19	Supports and framing as usual. Decking: bushfire-resisting timber or timber species from E1
BAL-29	Supports, framing and decking materials all bushfire-resisting timber
BAL-40 BAL-FZ	Use suitable alternatives to timber

Decks – enclosed

(Materials used to enclose a subfloor space as for external walls.)

Materials and building methods as usual in compliance with AS 1684-1999	
Supports and framing - No special requirements	Decking: Bushfire-resisting timber or timber species from E1
Supports & framing - No special requirements	Decking: Bushfire-resisting timber
Supports & framing - No special requirements	Decking: use suitable alternatives to timber

Bushfire-resisting timbers (BRTs) include:	Blackbutt, Kwila (Merbau), Red Ironbark, River Red Gum, Silvertop Ash, Spotted Gum, Turpentine
Timber species* from E1 - density 750kg/m ³ or greater include:	All BRTs (above), also: Brownbarrel, Grey Box, Grey Gum, Grey Ironbark, Jarrah, Manna Gum, Messmate, Mountain Grey Gum, Southern Blue Gum, Sugar Gum, Sydney Blue Gum, Stringybark(s)
Timber species* from E2 - density 650kg/m ³ or greater include:	All species above, also: Alpine Ash, Mountain Ash, Shining Gum, White Cypress, Slash Pine

* Note a more detailed list of less available species can be found in Appendix E of AS3959