

Fire-Grade Plasterboard & Timber Systems



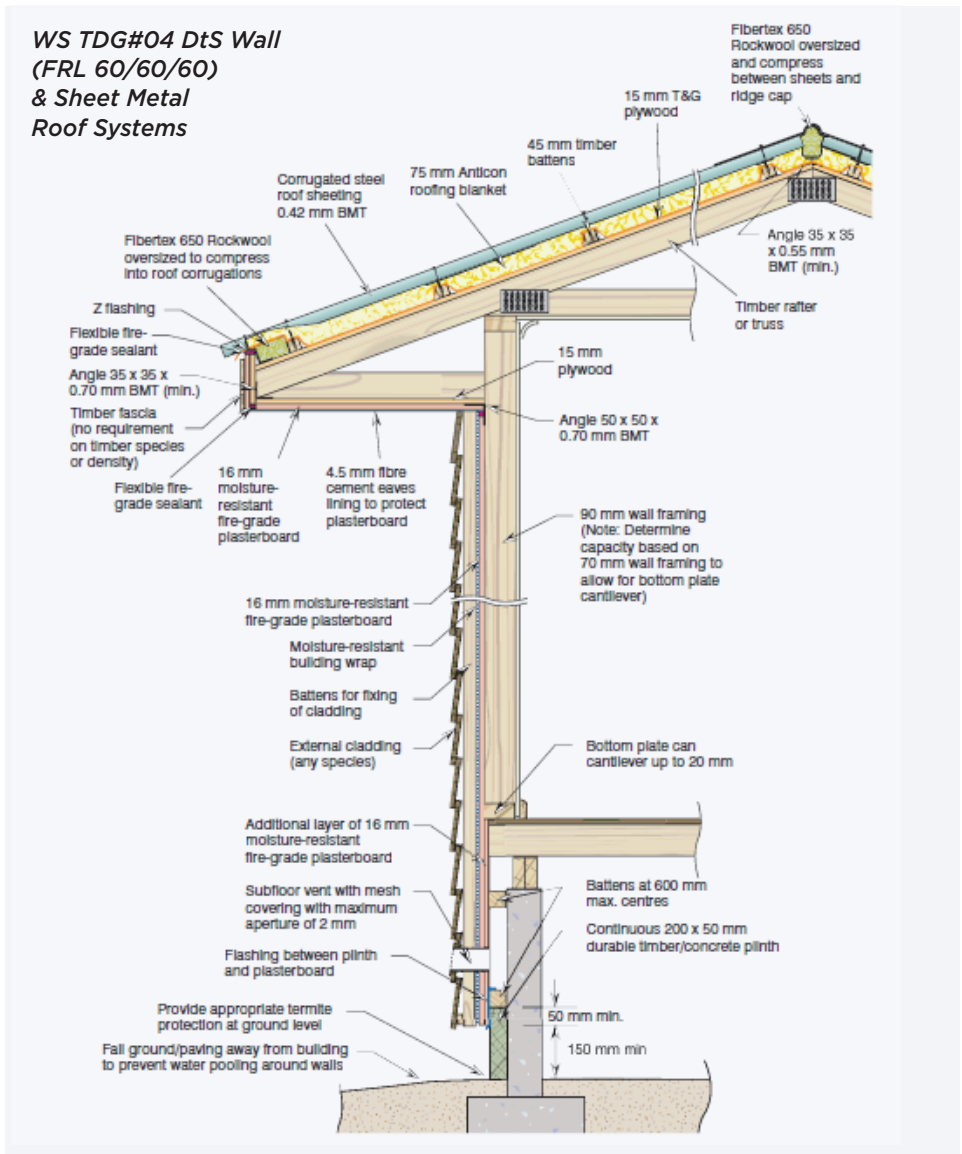
Homeowners may wish to construct their homes using a traditional, or modern, external weatherboard look. Specific construction methods will be dependent on the required Bushfire Attack Level.

BAL- LOW	No special construction requirements
BAL- 12.5 & 19	Bushfire-resisting or timber species listed in E1
BAL- 29	Bushfire-resisting 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) is required of 30/30/30 (structural adequacy / integrity / insulation).

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.



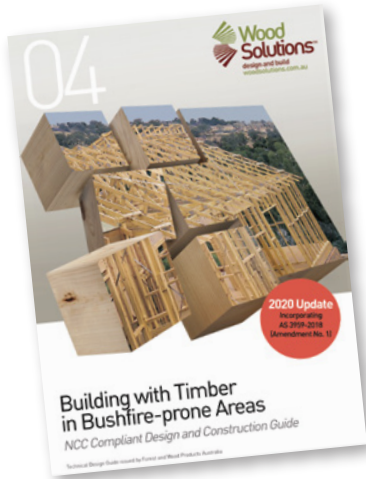
Further Information

For more complex details utilise WoodSolutions Technical Design Guide #04 *Building with Timber in Bushfire-prone Areas* in conjunction with AS3959. The Guide's simple approach and practical instructions will help you quickly establish what is required.

For further information and access to resources visit www.woodsolutions.com.au



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 requirements.



Timber Framed Housing in Bushfire-prone Areas

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



Designing to 'build out' bushfires requires minimising the risk of ember, radiant heat and even flame damage. With appropriate design decisions you can create a safe and desirable timber home, using sustainably sourced and renewable timber products both inside and out.

In bushfire-prone areas, all new buildings must be constructed in accordance to the current Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas.

AS3959 specifies the additional construction requirements for houses to improve their performance in the event of bushfire attack, for different home elements including roofs, external walls, flooring systems, supports, external doors, windows, vents, eaves, fascia's, guttering, verandas, decks and service pipes.

It should be clearly understood that there is no restriction on what structural timber products can be used for house framing or for internal joinery applications (flooring, linings, stairs, doors, etc) for homes built in bushfire-prone areas, when constructed in accordance with AS 3959.

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.

Bushfire Attack Level	Description of predicted bushfire attack and levels of exposure
BAL- LOW	Insufficient risk to warrant specific construction requirements.
BAL- 12.5	A risk of ember attack with a heat flux not greater than 12.5 kWm ² .
BAL- 19	A risk of ember attack and burning debris ignited by windborne embers together with a heat flux not greater than 19 kWm ² .
BAL- 29	Increasing risk of ember attack and burning debris ignited by windborne embers together with a heat flux not greater than 29 kWm ² .
BAL- 40	Much increased risk of ember attack and burning debris ignited by windborne embers together with a heat flux not greater than 40 kWm ² with the increased likelihood of exposure to flames from the fire front.
BAL- FZ	Extreme high risk of ember attack and burning debris ignited by windborne embers and direct exposure to flames.



Traditional Timber Framing Methods

(To be used in conjunction with AS3959-2018)

For Brick Veneer 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	Constructed in accordance with AS3959 Appendix H, or tested system to comply with AS 1530.8.2.

External wall cladding (brick veneer)	
All BALs	All traditional timber wall framing products are permitted. Where external 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.

Floors: bearers, joists, flooring - enclosed	
All BALs	When the timber sub-floor is fully enclosed, all traditional timber sub-floor framing products are permitted. Build as usual for the wall, floors and sub-floor supports.

Insulation of the floor or the use of insulated particleboard sheeting will improve the energy rating (6 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 (6 Star).

Brick veneer with enclosed sub-floor

High-set home with lightweight cladding

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	Constructed in accordance with AS3959 Appendix H, or tested system to comply with AS 1530.8.2.

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 with a flammability index not more than 5 should be applied over wall frames prior to fixing of external cladding.

[^]FRL - Fire resistance level - structural adequacy / integrity / insulation (minutes)

Sub-Floor Supports: posts, stumps, columns	
Open, unenclosed sub-floor space	
BAL-LOW	Traditional timber framing and wood products
BAL-12.5 BAL-19	Bushfire-resisting timber, with/or particleboard or plywood flooring where the underside is lined with sarking or mineral wool insulation
BAL-29	Underside of timber floor lined with a non-combustible material (eg fibre cement or metal sheet)
BAL-40 & BAL-FZ	Underside of timber floor system protected with a 30-minute resistance to the 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 use of insulated particleboard sheeting will improve the energy rating (6 Star) while still giving the low embodied energy, comfort and cost advantages of a timber floor.

Windows	
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

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

Decks - open, unenclosed	
BAL-LOW	Materials and building methods as usual in compliance with AS 1684-2010
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	
<i>(Materials used to enclose a subfloor space as for external walls.)</i>	
BAL-LOW	Materials and building methods as usual in compliance with AS 1684-2010
BAL-12.5 BAL-19	Supports and framing - No special requirements Decking: Bushfire-resisting timber or timber species from E1
BAL-29	Supports & framing - No special requirements Decking: Bushfire-resisting timber
BAL-40 & BAL-FZ	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/m3 or greater include:	All BRTs (above), <i>also</i> : 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/m3 or greater include:	All species above, <i>also</i> : 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