Planning for Bushfire Protection

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Reference: 1295
25/10/2018

Bushfire Risk Assessment Report

In relation to proposed development at:

No 7 Rockbath Road, Palm Beach

In accordance with the requirements of 4.14 of the EP&A Act No 203 Part (1) [b] This Assessment has been prepared and Certified by: Ronald Coffey *BPAD – A Certified Practitioner* *FPAA Cert. No: BPD-PA 09328*	
Can this proposal comply with AS3959, 2009 + addendum to Appendix 3 of PBP?	**YES**
What is the recommended level of compliance AS3959, 2009?	**BAL 12.5**
Does this development comply with the requirements of PBP?	**YES**
Does this development comply with the Aims and objectives of PBP?	**YES**
Is referral to the NSW RFS required?	**NO**
This assessment confirms that the proposal conforms to the specifications and requirements, that are relevant to the development, of the version (as prescribed by the regulations) of the document entitled Planning for Bushfire Protection prepared by the NSW Fire Service in co-operation with the NSW Department of Planning.	

Contents

Introduction

The purpose of this report is to determine the category of bushfire attack and subsequent construction standard for the proposed development of alterations and additions at No 7 Rock Bath Road, Palm Beach.

The site is identified as 'bush fire prone land' for the purposes of Section 146 of the *Environmental Planning and Assessment Act 1979* and the legislative requirements for building on bushfire prone lands are applicable.

The proposed development is an infill development as defined within Chapter 4.3.5 of Planning for Bushfire Protection 2006 and this report has been prepared in accordance with the requirements of Section 4.14 of the Environment Planning and Assessment Act.

This assessment includes an analysis of the hazard, threat and subsequent risk to the development proposal and provides recommendations that satisfy the Objectives and Performance requirements of the Building Code of Australia, Planning for Bushfire Protection 2006 [PBP] and Australian Standard AS3959, 2009.

The site was inspected: 25/10/2018

Summary of Assessment

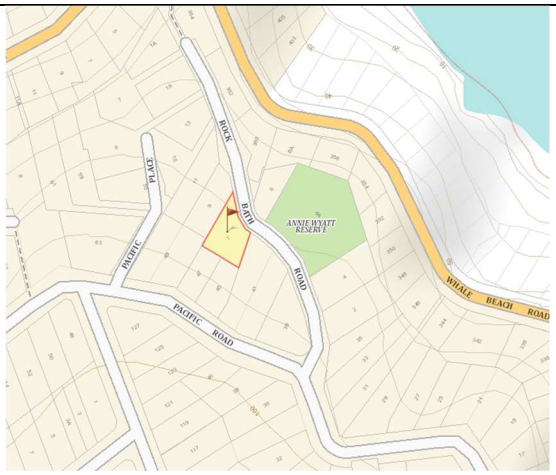
- Building construction and design – AS3959, 2009 BAL 12.5
- Asset Protection zones - Conforms to the requirements of PBP
- Landscaping - Conforms to the requirements of PBP
- Access and egress arrangements – Conforms to the requirements of PBP
- Water supply and utilities - Conforms to the requirements of PBP
- Defendable space - Conforms to the requirements of PBP
- Emergency Risk Management – Discussed and recommended

1) Location

No 7 Rock Bath Road, Palm Beach

Lot 346, DP 16362

LGA – Northern Beaches Council



2) Development Proposal and Building Classifications

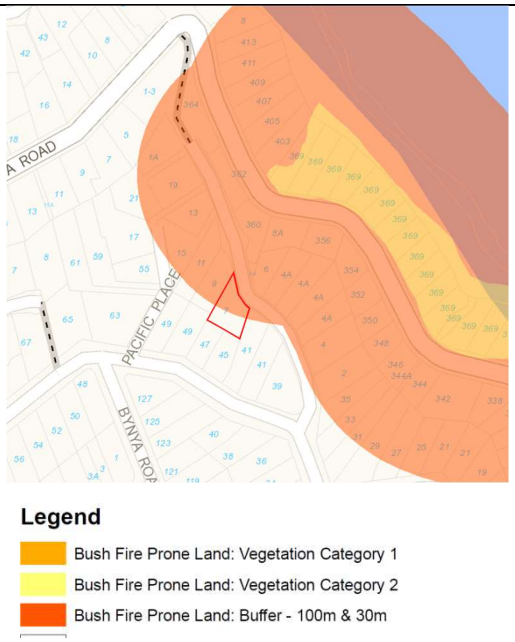
The proposal is for alterations and additions to an existing class 1A dwelling.

3) Description of the Subject Property

The development site is a residential lot facing north-east onto Rock Bath Road.

The following sections 4-8 describe in detail the vegetation, slope, access and egress, availability of water supplies and environmental considerations for the site.

The adjacent image is the bushfire prone land map for the area.



4) Classification of the Vegetation on and surrounding the Site

The site is developed and maintained and there is no threat from bushfire attack on the site.

Properties *south and west* of the subject site are developed and maintained and there is no threat of bushfire attack from these directions for more than 100m.

96m north and 124m east of the subject site is an area of bushland that is considered a threat from bushfire attack to the site.

With reference to PBP and the bushfire prone land map for the area this area of bushland is a remnant and a low hazard. The APZ requirements and building construction standards for this bushland area will be the same as for rainforests. [PBP-Appendix 2]

PBP Appendix 2, part [a] provides that *"Remnant vegetation is a parcel of vegetation with a size of less than 1ha or a shape that provides a potential fire run directly towards buildings not exceeding 50m. These remnants are considered a low hazard and APZ setbacks and building construction standards for these will be the same as for rainforests.*

The effective slope is to be determined over the length of the remnant."

In this instance the parcel of land considered a hazard is a narrow 'handle' 96m north of the subject site, is <50m wide and could not support a substantial run of fire towards the proposed development.

5) Assessment of Effective Slope

Effective slope away from the development site:

North: >15 degrees downslope

South: No hazard for >100m

East: No hazard for >100m

West: No Hazard for >100m

6) Access and Egress

The site has direct access to Rock Bath Road, which is a public road, and access and egress for emergency vehicles and evacuation appears adequate.

7) Adequacy of water supply

The area has reticulated water supply and hydrants are spaced at regular distances along Rock Bath Road.

8) Environmental Considerations

The scope of this assessment has not been to provide an environmental assessment; however, the subject site is a small residential lot that has been developed for many years and it appears that the proposed development will have no adverse environmental effect.

9) Bushfire Risk Assessment

Table 1; Reference AS3959, 2009 Table 2.4.2

Determination of category of bushfire attack for the site and subsequent required building standards

Direction	Distance of APZ	Vegetation Classification	Assessment of Effective Slope	Anticipated Radiant heat	Bushfire Attack Level (BAL)
North	94m	Remnant	>15^0 downslope	<12.5kw/m2	BAL 12.5
South	>140m	Developed sites	n/a	-	-
East	>140m	Developed sites	n/a	-	-
West	>140m	Developed sites	n/a	-	-
Summary: Based upon the relevant provisions of PBP the anticipated radiant heat attack for the site is <12.5kw/m2 and the subsequent minimum construction standard is BAL 12.5 AS3959, 2009.					

10) Assessment of the extent to which the construction conforms or deviates from Chapter 4 of 'Planning for Bushfire Protection 2006'

Performance Criteria	Acceptable Solutions	Meets Performance Criteria
The intent may be achieved where:		
In relation to APZ's: - Defendable space is provided - An APZ is provided and maintained for the life of the building.	Defendable space is provided on all sides of the building Asset protection zones are provided partially on site and by adjoining development and public roads.	Yes
In relation to siting and design: Buildings are sited and designed to minimise the risk of bushfire attack.	The siting of the building has been previously determined in accordance with local council requirements and the proposed additions and alterations will not involve a re-siting of the building [no advantage could be gained by recommending a re-siting of the building].	Yes
In relation to construction standards: It is demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Construction standards have been recommended in accordance with the requirements of PBP.	Yes
In relation to access requirements: Safe operational access is provided [and maintained] for emergency services personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire.	The access and egress requirements have been designed to provide safe and effective evacuation from the subject site and appear to be adequate for fire brigade personnel and fire-fighting equipment.	Yes
In relation to water and utility services: - Adequate water and electricity services are provided for fire-fighting operations - gas and electricity services are located so as to not contribute to the risk to a building.	The area has reticulated water supply and the nearest street hydrant is within the minimum required distance from the most distant point of the subject site in accordance with the requirements of PBP and AS2419.1 2005. This report shall recommend compliance with PBP 4.1.3 for services including electricity and gas.	Yes
In relation to landscaping: It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions.	The site is landscaped and managed and no part of the site is shown on the bushfire prone land map as a hazard. The development application includes a recommendations that new landscaping shall be in accordance with Inner Protection Area requirements of PBP.	Yes
In relation to Emergency and Evacuation Planning:	The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a *Bush Fire Survival Plan* as formulated by the NSW Rural Fire Service. An emergency evacuation plan is not recommended as a condition of consent.	Yes

11) Recommendations

The following recommendations are made for the bushfire protection measures for the proposed residential development of alterations and additions at No 7 Rock Bath Road, Palm Beach and are based upon the relevant provisions of the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006.*

1) Construction Standard: The proposed development shall be constructed to a minimum standard of Section 3 [construction general] and Section 5 [BAL12.5] of AS3959, 2009 *'Construction of Buildings in Bushfire Prone Areas'* and Section A3.7 of the NSW Rural Fire Service Addendum to Appendix 3 of '*Planning for Bushfire Protection 2006'*.
2) Construction Standard Class 10a Buildings: Class 10a buildings shall comply with the requirements of AS3959, 2009 Part 3.2. *Construction Requirements for Specific Structures*.
3) Construction Standard Class 10b: PBP 4.3.6 [f] At the planning stage, class 10b buildings in bushfire prone areas should be non-combustible. [Class 10b buildings include a retaining or free-standing wall, swimming pool or the like.]
4) Fences and Gates: All new fencing and gates shall be constructed in accordance with the NSW Rural Fire Service guideline: Fast Fact – *Fences or Gates in Bushfire Prone Areas*. [Refer Section 14 of this report]
5) Electricity and Gas Supplies: As far as practical, new electricity and gas supplies shall be installed in accordance with the requirements of 4.1.3 of PBP. Note: 4.1.3 of PBP requires that '*where practical, electrical transmission lines should be underground'* and '*the location of gas services will not lead to ignition of surrounding bushland or the fabric of the building'*.
6) Asset Protection Zones: All new proposed landscaping shall be in accordance the NSW RFS document 'Standards for asset protection zones.'

   The following points are a guide to Inner Protection area requirements.

   The Inner Protection Area should comprise of the following:

   - Minimal fine fuel on the ground;
   - Vegetation that does not provide a continuous path to the building for the transfer of fire;
   - Shrubs and trees that do not form a continuous canopy and vegetation is planted in clumps rather than continuous rows;

- Species that retain dead material or deposit excessive quantities of ground fuel are avoided;
- Shrubs and trees are pruned so that they do not touch or overhang the building; and
- Vegetation is located far enough away from the building so that plants will not ignite the building by direct flame contact or radiant heat emission.

7) Emergency and Evacuation Planning: The need to formulate an emergency evacuation plan has been discussed and it is advised that the residents should complete a *Bush Fire Survival Plan* as formulated by the NSW Rural Fire Service.
   An emergency evacuation plan is not recommended as a condition of consent.
8) Water Supplies: Reticulated water supply is located on the adjoining road at regular intervals and is easily accessible. No additional water supplies have been recommended.

12) Summary

This report consists of a bushfire risk assessment for the proposed residential development of alterations and additions at No 7 Rock Bath Road, Palm Beach.
The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.
The proposed development will be constructed to the minimum standards required in accordance with the guidelines of *Planning for Bushfire Protection 2006.*
This report has considered all the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations included in section 11 of this report, it is my considered opinion that the development satisfies the Objectives and Performance requirements of the *Building Code of Australia, Planning for Bushfire Protection 2006 and Australian Standard AS3959, 2009.*

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

This Report is a Bush Fire Hazard Assessment that provides the required information to assist Local Council and the Rural Fire Service in determining compliance in accordance with Planning for Bushfire Protection and AS 3959, 2009. The Local Council is the Final Consenting Authority and the construction of the building must comply with the recommendations included in the Council's conditions of consent.

Ron Coffey – Bushfire Safety Engineer
Grad I Fire E [Institute of Fire Engineers - 1973]
Grad Cert Fire Safety Eng. [UWS - 2003]
Grad Dip Building in Bushfire Prone Areas [UWS – 2005]
Ass Prof Cert in Expert Evidence in the Land & Environment Court [UTS – 2005]
Member - Institute of Fire Engineers
Corporate Member - Fire Protection Association Australia

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Planning for Bushfire Protection
Fire Protection Association of Australia
BPAD-A Certified Practitioner/Corporate Bronze Certified Business
Certification No BPD-PA09328
0408 220 443

13) References

Australian Building Codes Board
Building Code of Australia
Volumes 1&2
Canprint

Australian Building Codes Board [2001]
Fire Safety Engineering Guidelines
Edition 2001
ABCB Canberra

D. Drysdale D. [1998]
Introduction to Fire Dynamics 2nd Edition
John Wiley & Sons Ltd

NSW Government Environmental Planning and Assessment Act [1979]
Part 79BA – Consultation and development Consent – Certain Bushfire Prone Land
NSW Government Printer

Planning NSW [2006]
Planning for Bushfire Protection 2006
A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners
This document provides the necessary planning considerations when developing areas for residential use in residential, rural residential, rural and urban areas when development sites are in close proximity to areas likely to be affected by bushfire events and replaces Planning for Bushfire Protection 2001.
This document is essential reading: Download a copy from the RFS website or purchase a copy through the NSW Government Online Shop or phone 9228 6333

Ramsay C & Rudolph L [2003]
Landscape and Building Design for Bushfire Prone Areas
CSIRO Publishing

Standards Australia [2009]
Australian Standards 3959
Australian Building Code Board

14) Fences and Gates

BAL 12.5 & BAL 19

1. Where a timber fence does not connect to a dwelling and has a minimum of 1 metre separation from the dwelling then a fence may be constructed from hardwood, or non-combustible material.

2. Where a fence connects directly to or has less than 1 metre separation from a dwelling it should be constructed from non-combustible materials only.

3. In all cases where timber fences are proposed, care should be taken in the selection, location and maintenance of landscaping adjoining the fence. Unmanaged landscaping could promote fire activity due to ember, radiant heat and direct flame contact and then further impact timber fencing.

The above is based on the premise that construction for level 1 & 2 dwellings is sufficiently removed from the main fire front and won't be subjected to direct flame contact or extreme levels of radiant heat that may cause ignition of combustible materials. However, dwellings could still be exposed to significant levels of ember attack and relatively high levels of radiated heat that may cause fences to ignite.

BAL 29, BAL 40 &/or Flame Zone

Dwellings assessed as requiring these construction levels shall have fencing constructed from non-combustible materials e.g. Sheet metal or masonry. This is due to the increased likelihood of direct flame contact causing ignition of combustible materials which may provide a fire path to the dwelling.

BUSHFIRE RISK ASSESSMENT CERTIFICATE

THIS FORM IS TO BE COMPLETED BY A RECOGNISED CONSULTANT IN BUSHFIRE RISK ASSESSMENT IN ACCORDANCE WITH SECTION 4.14 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 NO 203

PROPERTY ADDRESS:	No 7 Rock Bath Road, Palm Beach
DESCRIPTION OF PROPOSAL:	Alterations and additions to an existing Class 1A dwelling
PLAN REFERENCE: (relied upon in report preparation)	This assessment is based on plans: Provided by: Dylan Farrell Design Dated: 26/06/2018 Project No: 220MHR
BAL RATING:	BAL (If the BAL rating is **FZ** the application is to be referred to NSW RFS for assessment.)
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	YES (NO) (Circle the relevant response) (If **YES** the application is to be referred to NSW RFS for assessment.)

I Ronald Coffey (Print Name) of Planning for Bushfire Protection (Trading or Company Name)

have carried out a bushfire risk assessment on the above-mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in *Appendix 4* of *Planning for Bushfire Protection 2006* together with recommendations as to how the relevant specifications and requirements are to be achieved.

REPORT REFERENCE:	1295
REPORT DATE:	25/10/2018
CERTIFICATION NO/ACCREDITED SCHEME:	Fire Protection Association Australia BPAD A Certified Practitioner No: BPD-PA-0938 Certified Business No: BPD-BA-0938

I hereby certify, in accordance with *Section 4.14 of the Environmental Planning and Assessment Act 1979 No 203*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and

2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements

BUSHFIRE RISK ASSESSMENT CERTIFICATE

THIS FORM IS TO BE COMPLETED BY A RECOGNISED CONSULTANT IN BUSHFIRE RISK ASSESSMENT IN ACCORDANCE WITH SECTION 4.14 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 NO 203

I am aware that the Bushfire Assessment Report, prepared for the above-mentioned site is to be submitted in support of a development application for this site and will be relied upon by Pittwater Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2006*.

SIGNATURE: DATE: 25/10/2018

SECTION 5 CONSTRUCTION FOR BUSHFIRE ATTACK LEVEL 12.5 (BAL—12.5)

5.1 GENERAL

A building assessed in Section 2 as being BAL—12.5 shall comply with Section 3 and Clauses 5.2 to 5.8.

NOTE: There are a number of Standards that specify requirements for construction; however, where this Standard does not provide construction requirements for a particular element, the other Standards apply.

Any element of construction or system that satisfies the test criteria of AS 1530.8.1 may be used in lieu of the applicable requirements contained in Clauses 5.2 to 5.8 (see Clause 3.8).

NOTE: BAL—12.5 is primarily concerned with protection from ember attack and radiant heat up to and including 12.5 kW/m2 where the site is less than 100 m from the source of bushfire attack.

SARKING

Any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall be:

a) Non-combustible; or

b) Breather-type sarking complying with AS/NZS 4200.1 and with a flammability index of not more than 5 (see AS1530.2) and sarked on the outside of the frame; or

c) An insulation material conforming to the appropriate Australian Standard for that material.

5.2 SUBFLOOR SUPPORTS

This Standard does not provide construction requirements for subfloor supports where the subfloor space is enclosed with—

a) a wall that complies with Clause 7.4; or

b) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion resistant steel, bronze or aluminium; or

c) a combination of Items (a) and (b) above.

d) Where the subfloor space is unenclosed, the support posts, columns, stumps, piers and poles shall be—

(i) of non-combustible material; or

(ii) of bushfire-resisting timber (see Appendix F); or

(iii) a combination of Items (i) and (ii) above.

NOTE: This requirement applies to the principal building only and not to verandas, decks, steps, ramps and landings (see Clause 7.7).

5.3 FLOORS

5.3.1 Concrete slabs on ground

The following specifications have been varied to include the requirements of the NSW RFS variation to the Australian Standard as outlined in the Addendum to Appendix 3 of Planning for Bushfire Protection 2006

For BAL 12.5 and BAL 19, Clause 5.3 and 6.3 shall be replaced by the provisions of clause 7.3. In this regard, clause 7.3 states:

7.3.1 Concrete slabs on ground

This Standard does not provide construction requirements for concrete slabs on ground.

7.3.2 Elevated floors

7.3.2.1 Enclosed subfloor space

This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with—

a) a wall that complies with Clause 5.4 or 6.4 as appropriate; or

b) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion resistant steel, bronze or aluminium; or

c) a combination of Items (a) and (b) above.

7.3.2.2 Unenclosed subfloor space

Where the subfloor space is unenclosed, the bearers, joists and flooring, less than 400mm above finished ground level, shall be one of the following:

(a) Materials that comply with the following:

(i) Bearers and joists shall be—

(A) Non-combustible; or

(B) bushfire-resisting timber (see Appendix F); or

(C) a combination of Items (A) and (B) above.

(ii) Flooring shall be—

(A) non-combustible; or

(B) bushfire-resisting timber (see Appendix F); or

(C) timber (other than bushfire-resisting timber), particleboard or plywood flooring where the underside is lined with sarking-type material or mineral wool insulation; or

(D) a combination of any of Items (A), (B) or (C) above. or

(b) A system complying with AS 1530.8.1

This Standard does not provide construction requirements for elements of elevated floors, including bearers, joists and flooring, if the underside of the element is 400 mm or more above finished ground level.

5.4 EXTERNAL WALLS

5.4.1 Walls

That part of an external wall surface that is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D) shall be of—

(a) non-combustible material; or

(b) fibre-cement external cladding, a minimum of 6 mm in thickness; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a timber species as specified in Paragraph E1, Appendix E; or

(e) a combination of any of Items (a), (b), (c) or (d) above.

There are no requirements for external wall surfaces 400 mm or more from the ground or for external wall surfaces 400 mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D).

5.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed to prevent gaps greater than 3 mm.

Alternatively, sarking-type material may be applied over the outer face of the frame prior to fixing any external cladding.

5.4.3 Vents and weepholes

Vents and weepholes in external walls shall be screened with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where the vents and weepholes are less than 3 mm (see Clause 3.6), or are located in an external wall of a subfloor space.

5.5 EXTERNAL GLAZED ELEMENTS AND ASSEMBLIES AND EXTERNAL DOORS

5.5.1 Bushfire shutters

Where fitted, bushfire shutters shall comply with Clause 3.7 and be made from—

(a) Non-combustible material; or

(b) A timber species as specified in Paragraph E1, Appendix E; or

(b) bushfire-resisting timber (see Appendix F); or

(c) A combination of any of Items (a), (b) or (c) above

5.5.1A Screens for windows and doors

Where fitted, screens for windows and doors shall have a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

Gaps between the perimeter of the screen assembly and the building element to which it is fitted shall not exceed 3 mm.

The frame supporting the mesh or perforated sheet shall be made from—

a) (d) Metal; or

b) (e) bushfire-resisting timber (see Appendix F); or

c) a timber species as specified in Paragraph E2, Appendix E.

5.5.2 Windows

Window assemblies shall comply with one of the following:

a) They shall be completely protected by a bushfire shutter that complies with Clause 5.5.1. Or

b) They shall be completely protected externally by screens that comply with Clause 5.5.1A. Or

c) They shall comply with the following:

(i) For window assemblies less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), window frames and window joinery shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F). or

(B) A timber species as specified in Paragraph E2, Appendix E. or

(C) Metal. or

(D) Metal-reinforced PVC-U.

The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the frame and sash shall satisfy the design load, performance and structural strength of the member.

(ii) Externally fitted hardware that supports the sash in its functions of opening and closing shall be metal.

(iii) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), the glazing shall be

Grade A safety glass minimum 4 mm, or glass blocks with no restriction on glazing methods.

NOTE: Where double glazed units are used the above requirements apply to the external face of the window assembly only.

(iv) Where glazing is other than that specified in Item (iii) above, annealed glass may be used.

(v) The openable portions of windows shall be screened internally or externally with screens that comply with Clause 5.5.1A.

5.5.3 Doors—Side-hung external doors (including French doors, panel fold and bi-fold doors)

Side-hung external doors, including French doors, panel fold and bi-fold doors, shall comply with one of the following:

a) They shall be protected by a bushfire shutter that complies with Clause 5.5.1. or

b) They shall be completely protected externally by screens that comply with Clause 5.5.1A. or

c) They shall comply with the following:

(i) Doors shall be—

(A) Non-combustible; or

(B) a solid timber door, having a minimum thickness of 35 mm for the first 400 mm above the threshold; or

(C) a door, including a hollow core door, with a non-combustible kickplate on the outside for the first 400 mm above the threshold; or

(D) a fully framed glazed door, where the framing is made from materials required for bushfire shutters (see Clause 5.5.1), or from a timber species as specified in Paragraph E2, Appendix E.

(ii) Where doors incorporate glazing, the glazing shall comply with the glazing requirements for windows.

(iii) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable.

(iv) Where any part of the door frame is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the door (see Figure D3, Appendix D), that part of the door frame shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F). or

(B) A timber species as specified in Paragraph E2, Appendix E. or

(C) Metal. or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the door assembly shall satisfy the design load, performance and structural strength of the member.

(v) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.

5.5.4 Doors—Sliding doors

Sliding doors shall comply with one of the following:

a) They shall be protected by a bushfire shutter that complies with Clause 5.5.1. or

b) They shall be completely protected externally by screens that comply with Clause 5.5.1A. or

c) They shall comply with the following:

(i) Any glazing incorporated in sliding doors shall be Grade A safety glass complying with AS 1288.

(ii) Both the door frame supporting the sliding door and the framing surrounding any glazing shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F). or

(B) A timber species as specified in Paragraph E2, Appendix E. Or

(C) Metal. or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the frame and the sash shall satisfy the design load, performance and structural strength of the member.

(iii) There is no requirement to screen the openable part of the sliding door. However, if screened, the screens shall comply with Clause 5.5.1A.

NOTE: The construction of manufactured sliding doors should prevent the entry of embers when the door is closed. There is no requirement to provide screens to the openable part of these doors as it is assumed that a sliding door will be closed if occupants are not present during a bushfire event. Screens of materials other than those specified may not resist ember attack.

(iv) Sliding doors shall be tight-fitting in the frames.

5.5.5 Doors—Vehicle access doors (garage doors)

The following apply to vehicle access doors:

a) The lower portion of a vehicle access door that is within 400 mm of the ground when the door is closed (see Figure D4, Appendix D) shall be made from—
   - Non-combustible material; or
   - bushfire-resisting timber (see Appendix F); or
   - fibre-cement sheet, a minimum of 6 mm in thickness; or
   - a timber species as specified in Paragraph E1, Appendix E; or
   - a combination of any of Items (i), (ii), (iii) or (iv) above.

b) Panel lift, tilt doors or side-hung doors shall be fitted with suitable weather strips, draught excluders, draught seals or guide tracks, as appropriate to the door type, with a maximum gap no greater than 3 mm.

c) Roller doors shall have guide tracks with a maximum gap no greater than 3 mm and shall be fitted with a nylon brush that is in contact with the door (see Figure D4, Appendix D).

d) Vehicle access doors shall not include ventilation slots.

5.6 ROOFS (INCLUDING VERANDA AND ATTACHED CARPORT ROOFS, PENETRATIONS, EAVES, FASCIAS, GABLES, GUTTERS AND DOWNPIPES)

5.6.1 General

The following apply to all types of roofs and roofing systems:

a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.

b) The roof/wall junction shall be sealed, to prevent openings greater than 3 mm, either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and between the rafters at the line of the wall.

c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

5.6.2 Tiled roofs

Tiled roofs shall be fully sarked. The sarking shall—

a) Have a flammability index of not more than 5;

b) Be located directly below the roof battens;

c) Cover the entire roof area including the ridge; and

d) Be installed so that there are no gaps that would allow the entry of embers where the sarking meets fascias, gutters, valleys and the like.

5.6.3 Sheet roofs

Sheet roofs shall—

a) Be fully sarked in accordance with Clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens; or

b) Have any gaps greater than 3 mm, under corrugations or ribs of sheet roofing and between roof components, sealed at the fascia or wall line and at valleys, hips and ridges by—

(i) A mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or

(ii) Mineral wool; or

(iii) Other non-combustible material; or

(iv) A combination of any of Items (i), (ii) or (iii) above.

5.6.4 Veranda, carport and awning roofs

The following apply to veranda, carport and awning roofs:

(a) A veranda, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clauses 5.6.1, 5.6.2, 5.6.3, 5.6.5 and 5.6.6.

(b) A veranda, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c), Appendix D] complying with Clause 5.4 shall have a non-combustible roof covering.

NOTE: There is no requirement to line the underside of a veranda, carport or awning roof that is separated from the main roof space.

5.6.5 Roof penetrations

The following apply to roof penetrations:

(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors, shall be adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible.

(b) Openings in vented roof lights, roof ventilators or vent pipes shall be fitted with ember guards made from a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(c) All overhead glazing shall be Grade A safety glass complying with AS 1288.

(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass minimum 4 mm, shall be used in the outer pane of the IGU.

(e) Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index no greater than 5.

(f) Evaporative cooling units shall be fitted with butterfly closers at or near the ceiling level or, the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(g) Vent pipes made from PVC are permitted.

5.6.6 Eaves linings, fascias and gables

The following apply to eaves linings, fascias and gables:

(a) Gables shall comply with Clause 5.4.

(b) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 5.6.5.

(c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds.

This Standard does not provide construction requirements for fascias, bargeboards and eaves linings.

5.6.7 Gutters and downpipes

This Standard does not provide material requirements for—

(a) Gutters, with the exception of box gutters; and

(b) Downpipes.

If installed, gutter and valley leaf guards shall be non-combustible.

Box gutters shall be non-combustible and flashed at the junction with the roof with noncombustible material.

5.7 VERANDAS, DECKS, STEPS, RAMPS AND LANDINGS

5.7.1 General

The following specifications have been varied to include the requirements of the NSW RFS variation to the Australian Standard as outlined in the Addendum to Appendix 3 of Planning for Bushfire Protection 2006

Decking may be spaced.

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.

C5.7.1 Spaced decking is nominally spaced at 3 mm (in accordance with standard industry practice); however, due to the nature of timber decking with seasonal changes in moisture content, that spacing may range from 0–5 mm during service. The preferred dimension for gaps is 3 mm (which is in line with other ‘permissible gaps’) in other parts of this Standard.

It should be noted that recent research studies have shown that gaps at 5 mm spacing

afford opportunity for embers to become lodged in between timbers, which may contribute to a fire. Larger gap spacing of 10 mm may preclude this from happening but such a spacing regime may not be practical for a timber deck.

5.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.2.1 Materials to enclose a subfloor space

The subfloor spaces of verandas, decks, steps, ramps and landings are considered to be 'enclosed' when—

a) the material used to enclose the subfloor space complies with Clause 7.4; and all openings greater than 3 mm are screened with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

5.7.2.2 Supports

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

5.7.2.3 Framing

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).

5.7.2.4 Decking, stair treads and the trafficable surfaces of ramps and landings

Decking, stair treads and the trafficable surfaces of ramps and landings shall be—

a) of non-combustible material; or

b) of bushfire-resisting timber (see Appendix F); or

a combination of Items (a) and (b) above.

5.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.3.1 Supports

Support posts, columns, stumps, stringers, piers and poles shall be—

a) of non-combustible material; or

b) of bushfire-resisting timber (see Appendix F); or

c) a combination of Items (a) and (b) above.

5.7.3.2 Framing

Framing of verandas, decks, ramps or landings (i.e., bearers and joists) shall be—

a) of non-combustible material; or

b) of bushfire-resisting timber (see Appendix F); or

c) a combination of Items (a) and (b) above.

5.7.3.3 Decking, stair treads and the trafficable surfaces of ramps and landings

Decking, stair treads and the trafficable surfaces of ramps and landings shall be—

a) of non-combustible material; or

b) of bushfire-resisting timber (see Appendix F); or

c) a combination of Items (a) and (b) above.

5.7.4 Balustrades, handrails or other barriers

Those parts of the handrails and balustrades less than 125 mm from any glazing or any combustible wall shall be—

a) of non-combustible material; or

b) bushfire-resisting timber (see Appendix F); or

c) a combination of Items (i) and (ii) above.

Those parts of the handrails and balustrades that are 125 mm or more from the building have no requirements.

5.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water and gas supply pipes shall be metal.

Appendix E list of Timbers AS3959, 2009

Standard trade name Botanical name	Corymbia citriodora
Ash, alpine Eucalyptus delegatensis	Gum, sugar Eucalyptus cladocalyx
Ash, Crow's Flindersia australis	Hardwood, Johnstone River Backhousia bancroftii
Ash, mountain Eucalyptus regnans	Ironbark, grey Eucalyptus paniculata
Ash, silvertop Eucalyptus sieberi	Ironbark, red Eucalyptus sideroxylon
Balau (selangan batu) Shorea spp.	Jarrah Eucalyptus marginata
Bangkirai Shorea laevifolia	Kapur Dryobalanops spp.
Beech, myrtle Nothofagus cunninghamii	Karri Eucalyptus diversicolor
Belian Eusideroxylon zwageri	Kempas Koompassia malaccensis
Blackbutt Eucalyptus pilularis	Keruing Dipterocarpus spp.

Blackbutt, New England Eucalyptus andrewsii Eucalyptus campanulata Blackwood Acacia melanoxylon Box, brush Lophostemon confertus Box, grey Eucalyptus microcarpa Box, grey, coast Eucalyptus bosistoana Box, white-topped Eucalyptus quadrangulata Box, yellow Eucalyptus melliodora Brownbarrel Eucalyptus fastigata Candlebark Eucalyptus rubida Cypress Callitris glaucophylla Gum, blue, southern Eucalyptus globulus Gum, blue, Sydney Eucalyptus saligna Gum, grey Eucalyptus propinqua Gum, grey, mountain Eucalyptus cypellocarpa Gum, Maiden's Eucalyptus maidenii Gum, manna Eucalyptus viminalis Gum, mountain Eucalyptus dalrympleana Gum, red, forest Eucalyptus tereticornis Gum, red, river Eucalyptus camaldulensis Gum, rose Eucalyptus grandis Gum, shinning Eucalyptus nitens Corymbia maculata Corymbia henryi Gum, spotted	Kwila (Merbau) Intsia bijuga Mahogany, Philippine red, dark Shorea spp. Mahogany red Eucalyptus resinifera Mahogany, southern Eucalyptus botryoides Mahogany, white Eucalyptus acmenoides Messmate Eucalyptus obliqua Messmate, Gympie Eucalyptus cloeziana Northern Box (Pelawan) Tristaniopsis spp. Oak , American Quercus spp. Peppermint, narrow-leaved Eucalyptus australiana Pine, celery-top Phyllocladus asplenifolius Pine, slash Pinus elliottii Ramin Gonystylus spp. Rosewood, New Guinea Pterocarpus indicus Satinay Syncarpia hillii Stringybark, Blackdown Eucalyptus sphaerocarpa Stringybark, blue-leaved Eucalyptus agglomerata Stringybark, brown Eucalyptus baxteri Stringybark, silvertop Eucalyptus laevopinea Stringybark, white Eucalyptus eugenioides Stringybark, yellow Eucalyptus muelleriana Tallowwood Eucalyptus microcorys Taun Pometia pinnata Turpentine Syncarpia glomulifera Vitex, New Guinea Vitex cofassus Woollybutt Eucalyptus longifolia

Appendix F list of Timbers AS3959, 2009

Black-butt - Eucalyptus pilularis

Turpentine - Syncarpia glomulifera

Silver Top Ash - Eucalyptus sieberi

Spotted Gum - Corymbia maculate - Corymbia henryi - Corymbia citriodora

Red Iron Bark - Eucalyptus sideroxylon

Kwila[Merbau] - Intsia bijuga

Red River Gum - Eucalyptus camaldulensis

SECTION 3 CONSTRUCTION GENERAL

3.1 GENERAL

This Section specifies general requirements for the construction of buildings for all Bushfire Attack Levels (BALs).

NOTE: There are a number of Standards that specify requirements for construction; however, where this Standard does not provide construction requirements for a particular element, the other Standards apply.

3.2 CONSTRUCTION REQUIREMENTS FOR SPECIFIC STRUCTURES

3.2.1 Attached structures

Where any part of a garage, carport, veranda or similar roofed structure is attached to, or shares a common roof space with, a building required to comply with this Standard, the entire garage, carport, veranda or similar roofed structure shall comply with the construction requirements of this Standard, as applicable to the subject building. Alternatively, the structure shall be separated from the subject building by a wall that extends to the underside of a non-combustible roof covering, and that complies with one of the following:

(a) The wall shall have an FRL of not less than 60/60/60 for load bearing walls and –/60/60 for non-load bearing walls when tested from the attached structure side and shall have openings protected as follows:

(i) Doorways—by FRL –/60/30 self-closing fire doors.

(ii) (ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed position.

(iii) (iii) Other openings—by construction with an FRL not less than –/60/–.

NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)];

or

(b) The wall shall be of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness and shall have openings protected as follows:

(i) Doorways—by FRL –/60/30 self-closing fire doors.

(ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed position.
(iii) Other openings—by construction with an FRL not less than –/60/–.
NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for Pipes and conduits need not comply with the above [Item (iii)].

3.2.2 Garages and carports below the subject building

Where a garage or carport is below a building required to comply with this Standard, it shall comply with the construction requirements of this Standard, as applicable to the subject building.
Alternatively, any construction separating the garage or carport (including walls and flooring systems) from the remainder of the building shall comply with one of the following:
(a) The separating construction shall have an FRL of not less than 60/60/60 for load bearing construction and –/60/60 for non-load bearing construction when tested from the garage or carport side and shall have openings protected in accordance with the following:
(i) Doorways—by –/60/30 self-closing fire doors.
(ii) Windows—by –/60/– fire windows permanently fixed in the closed position.
(iii) Other openings—by construction with an FRL not less than –/60/–.
NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].
or
(b) Where part or all of the separating construction is a wall, the wall need not comply with Item (a) above, provided the wall is of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness and the wall has openings protected in accordance with the following:
(i) Doorways—by –/60/30 self-closing fire doors.
(ii) Windows—by –/60/– fire windows permanently fixed in the closed position.
(iii) Other openings—by construction with an FRL not less than –/60/–.
NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].

3.2.3 Adjacent structures

Where any garage, carport, or similar roofed structure is not attached to a building required to comply with this Standard, the entire garage, carport, or similar roofed structure on the subject allotment shall comply with the construction requirements of this Standard.

Alternatively, the adjacent structure shall be separated from the subject building by one of the following:

(a) A distance of not less than 6 m *[NSW RFS Variation increases this distance to 10m]* from the building required to comply with this Standard;

or

(b) A wall that extends to the underside of a non-combustible roof covering and has an FRL of not less than 60/60/60 for load bearing walls and –/60/60 for non load bearing walls when tested from the attached structure side. Any openings in the wall shall be protected in accordance with the following:

(i) Doorways—by FRL –/60/30 self-closing fire doors.

(ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed position.

(iii) Other openings—by construction with an FRL not less than –/60/–.

NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)];

or

(c) A wall that extends to the underside of a non-combustible roof covering and is of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness. Any openings in the wall shall be protected in accordance with the following:

(i) Doorways—by FRL –/60/30 self-closing fire doors.

(ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed position.

(iii) Other openings—by construction with an FRL not less than –/60/–.

NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].

3.3 EXTERNAL MOULDINGS

Unless otherwise required in Sections 4 to 9, combustible external mouldings, jointing strips, trims and sealants may be used for decorative purposes or to cover joints between sheeting material.

3.4 HIGHER LEVELS OF CONSTRUCTION

Construction requirements specified for a particular Bushfire Attack Level (BAL) shall be acceptable for a lower level. For example, if the site has been assessed at BAL—12.5, BAL—12.5 construction is required; however any element or combination of elements contained BAL—19, BAL—29, BAL—40 and BAL—FZ levels of construction may be used to satisfy this Standard.

3.5 REDUCTION IN CONSTRUCTION REQUIREMENTS DUE TO SHIELDING

The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all of the straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building (see Figure 3.1).

The construction requirements for a shielded elevation shall be not less than that required for BAL—12.5, except where the exposed elevations have been determined as BAL—LOW.

3.6 VENTS, WEEPHOLES AND GAPS

Where a circular probe of 3 mm diameter is capable of being passed through external vents, weepholes or gaps, the vents, weepholes and gaps shall be screened as specified in Sections 3, 5, 6, 7, 8 and 9, except for weepholes from the frames of windows and glazed doors.

To determine the maximum aperture size of screening material, it shall not be possible to pass a circular probe of 2 mm diameter through the aperture.

Gaps between doors and the door jambs, heads or sills (thresholds) shall be as shown in Figure 3.2. Alternatively, gaps shall be protected by draught excluders.

C3.6 Weepholes from the frames of windows and glazed doors and those gaps between doors and door jambs heads or sills (thresholds) that may exceed 3 mm (see Figure 3.2) are exempt from screening because they do not provide a direct passage for embers to the interior of the building or building cavity.

3.7 BUSHFIRE SHUTTERS

Bushfire shutters shall—

(a) Be fixed to the building and be non-removable;

(b) When in the closed position, have no gap greater than 3 mm between the shutter and the wall, the sill or the head;

(c) Be readily manually operable from either inside or outside;

(d) Protect the entire window assembly or door assembly;

(e) Consist of materials specified in Clauses 5.5.1, 6.5.1, 7.5.1, 8.5.1 and 9.5.1 for the relevant BAL; and

(f) Where perforated, have—

i) uniformly distributed perforations with a maximum aperture of 3 mm when the shutter is providing radiant heat protection or 2 mm when the shutter is also providing ember protection (such as where the openable portion of the window is not screened in accordance with the requirements of the respective BAL); and

ii) a perforated area no greater than 20% of the shutter.

If bushfire shutters are fitted to all external doors then at least one of those shutters shall be operable from the inside to facilitate safe egress from the building.

3.8 TESTING TO AS 1530.8

Where any material, element of construction or system satisfies the test criteria of either AS 1530.8.1, for BAL—12.5, BAL—19, BAL—29 and BAL—40 or AS 1530.8.2 for BAL—FZ, it satisfies the requirements of that BAL.

If any material, element of construction or system satisfies the test criteria without screening for ember protection, the requirements of this Standard for screening of openable parts of windows or doors shall still apply.

3.9 GLAZING

Glazing requirements shall be in accordance with Sections 5 to 9 of this Standard.

See AS 1288 for an explanation of the terminologies used to describe various types of glass in this Standard.

3.10 SARKING

Where sarking is required in Sections 5 to 9, it shall have a flammability index of not more than 5 when tested to AS 1530.2.

3.11 TIMBER LOG WALLS

Where the thickness of a timber log wall is specified in Sections 5, 6 and 7, two criteria are nominated, as follows:

(a) The nominal overall thickness is the overall thickness of the wall.

(b) The minimum thickness is the thickness of the wall at the interface of two logs in the wall.

For most log profiles, the thickness of the log at the interface with an adjacent log is less than the overall thickness of the wall.