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Regulatory Information Report

Bushfire attack level (BAL) performance of various sheet metal roof systems

Sponsor: Forest and Wood Products Australia

Report number: 23626A Reference number: FAS200346 Revision: RIR9.1

Issue date: 12 October 2020 Expiry date: 30 September 2025

Quality management

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RIR 23626A-00	Issue: 10/07/2009	Reason for issue	Initial issue		
			Prepared by	Reviewed by	Approved by
		Name	K. Nicholls	S. Kettle	-
RIR 23626A-01	Issue: 13/07/2009	Reason for issue	Typographical amendment		
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		Name	K. Nicholls	S. Kettle	-
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		Name	K. Nicholls	S. Kettle	-
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			Prepared by	Reviewed by	Approved by
		Name	K. Nicholls	S. Kettle	-
23626A RIR9.0	Issue: 23/09/2020	Reason for issue	Inclusion of OSB 3 roof lining and revalidation for additional 5 years.		
			Prepared by	Reviewed by	Approved by
		Name	Rami Al Darwish	Omar Saad	Omar Saad
23626A RIR9.1	Issue: 12/10/2020	Reason for issue	Minor comments from client		
			Prepared by	Reviewed by	Approved by
	Expiry: 30/09/2025	Name	Rami Al Darwish	Omar Saad	Omar Saad
		Signature			

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General conditions of use

Executive summary

This report contains the minimum information sufficient for regulatory compliance and refers to the Assessment report 23626A.

The referenced assessment report presents an assessment of the bushfire attack level (BAL) performance of various sheet metal roof systems if tested in accordance with AS 1530.8.2-2007 Section 16 (Flame Zone)

The analysis conducted in section 5 of the referenced assessment report found that the proposed variations are likely to achieve BAL-FZ classification as shown in Table 1, if tested in accordance with AS 1530.8.2-2007.

Table 1 Variations and assessment outcome

Product	Reference test	Figure reference	Variation	Assessment classification
Concrete and terracotta tile roof systems	EWFA 2368000, EWFA 2398800, BWA 2358300, and BWA 2367700	Figure 1 to Figure 8	A shown in Table 4	BAL-FZ

The variations and outcome of this assessment are subject to the limitations and requirements described in section, 4 and 6 of this report. The results of this report are valid until 30 September 2025.

Contents

1. Introduction

The referenced assessment report presents an assessment of the bushfire attack level (BAL) performance of various sheet metal roof systems if tested in accordance with AS 1530.8.2-2007[1] Section 16 (Flame Zone)

This Report supersedes the Report RIR 23626A-08.

The assessed systems were tested in accordance with AS 1530.8.2-2007 and include representative junction details at the roof fascia, ridge, hip and barge location.

The referenced assessment report was carried out at the request of Forest and Wood Products Australia. The sponsor details are included in Table 2.

Table 2 Sponsor details

Sponsor	Address
Forest and Wood Products Australia	Level 4, 10–16 Queen Street, Melbourne, VIC, 3000

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2. Declaration

The guide to undertaking assessments in lieu of fire tests prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal dated 27 August 2020, Forest and Wood Products Australia confirmed that

- To their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the standard against which this assessment is being made.
- They agree to withdraw this assessment from circulation if the component or element of structure is the subject of a fire test by a test authority in accordance with the standard against which this assessment is being made and the results are not in agreement with this assessment.
- They are not aware of any information that could adversely affect the conclusions of this assessment and – if they subsequently become aware of any such information, they agree to ask the assessing authority to withdraw the assessment.

[1] Standard Australia, AS 1530.8.2-2007: *Methods for fire tests on building materials, components and structures*, 2007, Australia.

3. Description of the specimen and variations

3.1 Referenced test data

The assessment of the variation to the tested system and the determination of the likely performance is based on the results of the fire test/s documented in the reports summarised in Table 3. Further details of the tested system are described in Appendix B from the referenced assessment report.

Table 3 Referenced test data

Report number	Test sponsor	Test date	Testing authority
BWA 2371400.2	Forest and Wood Products Australia	29 June 2009	Warringtonfire (previously known as Bodycot Warringtonfire)
BWA 2371300.2	Forest and Wood Products Australia	29 June 2009	Warringtonfire (previously known as Bodycot Warringtonfire)
EWFA 2394700	Forest and Wood Products Australia	25 September 2009	Warringtonfire (previously known as Exova Warringtonfire)
EWFA 23712-00	Forest and Wood Products Australia	9 September 2009	Warringtonfire (previously known as Exova Warringtonfire)
EWFA 23946-00	Forest and Wood Products Australia	8 September 2009	Warringtonfire (previously known as Exova Warringtonfire)
19-001887	Egger Australasia Pty Ltd	28/06/2019	AWTA Product Testing
EWFA 45981	Forest and wood products Australia limited	23/06/2009.	Warringtonfire.Pty Ltd

3.2 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the system / product / component using baseline test information for similar systems. The variations to the tested system/s together with the referenced baseline standard fire tests – are described in Table 4.

Table 4 Variation to tested systems

Item	Reference tests	Description	Variations
1	BWA 23713-00.2	The test specimen comprised a series of timber roof trusses at 600mm centres made from 90mm x 35mm elements lined on the top chord with a 9mm thick layer of Promat PROMATECT® 40. Bluescope Topspan 40 battens, of 0.55mm bmt, were positioned horizontally across the PROMATECT® 40, one at the ridge, one at the fascia and one in the field of the roof. A layer of Bradford 55 mm Light Duty Anticon blanket with the foil side down was installed over whole roof area on top of the battens.	• The addition of 15mm plywood to the eaves/soffit above the 16mm Boral Firestop and below the eaves/soffit framing. • The use of eaves/soffit made from 16mm Boral Firestop overlaid with 9mm PROMATECT® 40 as tested in EWFA 23947-00.1. • Bradford 75mm light duty Anticon in lieu of the Bradford 55mm light duty Bradford Anticon as tested. • Substitution of 15mm plywood with 9mm PROMATECT® 40 with Bradford 55mm light duty Bradford Anticon as in BWA 23714-00.2 • The use of 90mm x 45mm timber battens in lieu of the steel and timber battens tested • The addition of a 4.5mm thick fibre cement eaves lining based on design. • Size of the roof may be increased • Roof pitch varies between a practical minimum and 75º.

Item	Reference tests	Description	Variations
			• Roofing finish be Colorbond or Zincalume in lieu of the roofing and ridge capping colour or finish tested • Roofing components to range in thickness between 0.6mm and 0.42mm • Framing may be trusses or rafters • Framing may be steel in lieu of timber tested • Truss or rafter spacing may be optionally 900 mm, and 1200 mm spacing in lieu of 600mm tested. • Ridge capping scribed in lieu of unscribed capping as tested • Increase in insulation thickness where cavity size permits • Barge and gable and hip detail • Inclusion of four valley detail options based on those as tested in EWFA 23947-00.1 and EWFA 23976-00 and EWFA 23712-00.1 • Minimum density required for Pine Fascia Board. • Confirmation of Anticon75 roofing blanket thickness. • Inclusion of 15 mm thick Oriented Strand Board (OSB 3) roof lining material instead of the tested 15 mm thick pine plywood roof lining.

3.3 Schedule of components

Table 5 outlines the schedule of components for the assessed system/s subject to a fire test, as referenced in appendix B from the referenced assessment report.

Table 5 Schedule of components of assessed systems

Item	Description	
1	Name	Corrugated Roof cladding
	Material	0.42 mm or 0.6 mm thick steel cladding made to AS 1445.
	Installation	Roof sheeting installed to structural battens by at least one fixing every second corrugation in the field of the sheet. At the edges of the roof at location as such as fascia, hip the sheet shall be fixed at every corrugation with self-drilling hex head, with EPDM seal and shank guard.
2	Name	Roof Lining Material
	Either	
	Lining	15 mm thick (minimum) Seasoned Pine plywood or 15 mm thick (minimum) Oriented Strand Board (OSB 3) wood panels.
	Installation	Fixing of Plywood and OSB 3 linings to framing shall be as for flooring accordance with timber framing code and as per the manufacturer's standard installation guidelines. Butt joints in sheets shall be backed by framing or additional nogging.
	Or	
	Name	9mm PROMATECT® 40 (mineral bound magnesia board)
	Installation	The PROMATECT® 40 arranged such that all butt joins fall on roof framing or are backed by additional nogging. Fixings shall be nominally at 600mm centres or as required to meet local wind requirements during construction.

Item		Description
3	Name	Roof Insulation
	Material	Bradford light duty Anticon™ Roofing Blanket, Glass wool insulation blanket with foil fixed to one side
	Size	80 mm thick for plywood roof lining and 55 mm for PROMATECT® 40 roof lining
	Installation	Anticon™ positioned with foil down and laid over battens and under the roof sheeting.
4	Name	Roofing batten
	Either	
	Material	Seasoned pine batten maximum 90 mm in width and maximum 45mm in depth
	Installation	Fixed to roof framing to meet structural requirements.
	Or	
	Material	Steel top hat batten made from nominally 0.55 mm steel. Batten height nominally 40 mm high 32 mm head and 14mm flanges.
	Installation	Fixed to roof framing to meet structural requirements. (Note 500 µm polyethylene strip (such as damp course) is required between batten and PROMATECT® 40 option of Item 2.
5	Name	Roof Lining Flashing
	Size	35 × 35 × 0.55mm (min) Galvanised steel
	Installation	Fixed on top if joints in roof lining at ridge and hips to cover gaps in plywood or Oriented Strand Board (OSB 3). Installed in a such a manner to exclude visible gaps at joins in roof lining material and fixed to roof lining (item 2)
6	Name	Cavity closure flashing
	Size	Galvanised steel Z section profile with 40mm top and bottom legs and made form 0.55 mm (minimum) steel and 40 mm deep.
	Installation	Installed at the edges of roofs and the eaves. Fixed to roof lining board with 8g self-drilling screws (min) at nominally 600 mm centres. Sealant (Item 11) to be installed into any gaps between this flashing and the fascia.
7	Name	Cavity Closure Insulation
	Material	Bradford Fibretex 650 Rockwool
	Size	75mm thick
	Installation	At the eaves location - A 90 mm wide strip positioned on edge and compressed with Anticon (item 3) to a thickness of 40 mm by the roof sheeting (item 1) At ridge – Install a strip 90mm widen to gap between roof sheets so that Rockwool is compressed to 50% of original thickness
8	Name	Roof framing
	Either	
	Material	Timber
	Size	Solid Timber framing or timber trusses shall be sized in accordance with the relevant framing and design standards.
	Installation	Spaced at 600 mm, 900 mm or 1200 mm centres based on appropriate structural design of framing/trusses battens and roof lining board.
	Or	
	Material	Steel
	Size	Steel framing or steel trusses shall be designed in accordance with the relevant framing and design standards.

Item		Description
	Installation	Spaced at 600 mm, 900 mm or 1200 mm centres based on appropriate structural design of framing/trusses battens and roof lining board.
9	Name	Facia Linings
	Either	
	Linings	16 mm Boral Firestop plasterboard over 15 mm Pine Plywood or 15 mm thick Oriented Strand Board (OSB 3) wood panels
	Installation	Plywood/OSB fixed to rafters such that all joins fall on framing members or are backed with nogging. Plasterboard orientated so that butt joins do not fall on joins in plywood/OSB. Joins shall be left open and 6-10 mm wide and gaps filled with sealant (item 11). Plasterboard to be fixed to plywood/OSB at 150mm centres at the top and bottom of the facia. Plasterboard to be fixed with 6g x 30mm plasterboard screws.
	Or	
	Linings	9 mm PROMATECT® 40 over 16 mm Boral Firestop plasterboard
	Installation	Promatect nominally fixed to rafters such that all joins fall on framing members or are backed with nogging. Plasterboard orientated so that butt joins do not fall on joins in plywood/OSB. Joins shall be left open and 6-10mm wide and gaps filled with sealant (item 11). Plasterboard to be fixed to plywood/OSB at 150 mm centres at the top and bottom of the facia. Plasterboard to be fixed with 6g x 30 mm plasterboard screws.
10	Name	Fascia
	Either	
	Size	Pine Fascia Board 19 mm thick - Nominally deep enough to fully cover the fascia linings.(Minimum Density of 500 kg/m³)
	Installation	Fixed to rafters as a minimum in accordance with normal building practice.
	Or	
	Size	Steel Fascia Profile
	Installation	Installed over clips that were fixed through the fascia to the ends of the rafters at each rafter point. At internal and external corners, the use of fascia fixing angles in permitted.
11	Name	Sealant
	Material	Promat PROMASEAL® AN acrylic sealant
	Installation	Installed into gap 6 mm – 10 mm wide at the eaves fascia and eaves wall junction. Installed into a gap 3 mm wide at the recessed plaster joints backed by framing.
12	Name	Ridge Capping
	Material	0.42 mm to 0.6 mm thick steel (typical)
	Size	Nominally 330 mm wide and 85 mm high with a nominally 35 mm diameter dome peak. May be scribed or unscribed into the profile of the roof sheeting.
	Installation	Ridge capping shall be screw fixed to roof sheeting or to the batten in accordance with normal roof practice or standards.
13	Name	Eaves Linings
	Either	
	Linings	16 mm Boral Firestop plasterboard over 15 mm Pine Plywood or 15 mm thick Oriented Strand Board (OSB 3) wood panels.
	Installation	Plywood/OSB orientated so that all joins fall on framing members or steel angles (item 2) at fascia or at wall, Sheets are to be fixed to roof framing at nominally 200mm centres with screws a minimum of 50mm long

Item		Description
		Plasterboard orientated so that butt joins do not fall on joins in plywood/OSB. Plasterboard to be fixed to plywood/OSB at 150mm centres at perimeter and rows 600mm centres apart with fixing at 200mm centre spacing in the field. Plasterboard to be fixed with plasterboard screws (item 4). *Note - An additional fibre cement eaves lining is required below this eaves option (item 16).*
	Or	
	Linings	9 mm PROMATECT® 40 over 16 mm Boral Firestop plasterboard
	Installation	Plasterboard orientated so that butt joins do not fall on joins in PROMATECT® 40. Plasterboard to be fixed to PROMATECT® 40 at 150mm centres at the perimeter and rows 600mm centres apart with fixing at 200mm centre spacing in the field. Plasterboard to be fixed with plasterboard screws (item 4) PROMATECT® 40 orientated so that all joins fall on framing members or steel angles (item 2) at fascia or at wall, Sheets are to be fixed at nominally 200mm centres with screws a minimum of 50 mm long. *Note - Fibre cement eaves lining is NOT required below this eaves option.*
14	Name	Framing Angle
	Size	35 mm x 35 mm x 0.70 mm (min) galvanised steel angle
	Installation	Fixed to the end of the trusses and along the wall to support the eaves linings.
15	Name	Support wall
	Description	Wall otherwise tested or assessed to achieve a performance of BAL – FZ.
16	Name	Additional Fibre Cement Eaves Lining
	Size	4.5 mm fibre cement eaves lining system
	Installation	The eave lining sheets may be butt joined or flush joined on framing, or butt joined off framing with plastic joiners. If PVC joiners are used they shall not be used to support the sheeting, support shall be proved to the sheet on each side of the join. Sheeting shall be fixed to framing spaced at no more than 600 mm centres. The spacing of fixing into the support framing shall be a minimum of 200 mm centres.
17	Name	Barge Board Capping
	Material	0.42 mm to 0.6 mm thick steel
	Size	15 0mm wide × nominal 75 mm leg
	Installation	Barge board capping shall be fixed by one screw every third corrugation to roof sheeting or to the batten.
18	Name	Valley Gutter
	Material	Zincalume Steel
	Size	330 mm straight across after installation in the valley. Each side was 195 mm long with a 0.55bmt with a nominal 12mm long lip.
	Installation	Secured through the valley lining into the roof lining with screws (item 10) at nominal 300 centres down each side.
19	Name	Sarking in valley
	Material	Proctor Roofshield
	Installation	Wrapped around plasterboard valley lining option (item 20)
20	Name	Valley Linings
	Either	
	Material	Boral Wet Area Plasterboard™ 16 mm thick wrapped in Proctor Roofshield (item 19)

Item		Description
	Installation	Cut to fit under the valley gutter and wrapped with proctor roof shield to protect it from the effect of water. Plasterboard nominally fixed to roof lining only to hold it in position. Butt joins in plasterboard 3 mm maximum. Butt joins shall be offset from joins in the roof lining.
	Or	
	Material	2 layers of 9 mm PROMATECT® 40
	Installation	Cut to fit under the valley gutter and wrapped with proctor roof shield to protect it from the effect of water. PROMATECT® 40 nominally fixed to roof lining only to hold it in position. Butt joins in PROMATECT® 40 offset between layers.
	Or	
	Material	2 layers of 15 mm plywood or 2 layers of 15 mm thick Oriented Strand Board (OSB 3) wood panels.
	Installation	Cut to fit under the valley gutter. Plywood/OSB nominally fixed to roof lining only to hold it in position. Butt joins in plywood/OSB offset between layers.
21	Material	Intumex PU (polyurethane sealant suitable for exterior use)
	Installation	Installed into gap between fascia (items 9) and the cavity closure flashing (item 6). Installed into at the side of the valley linings (item 20).

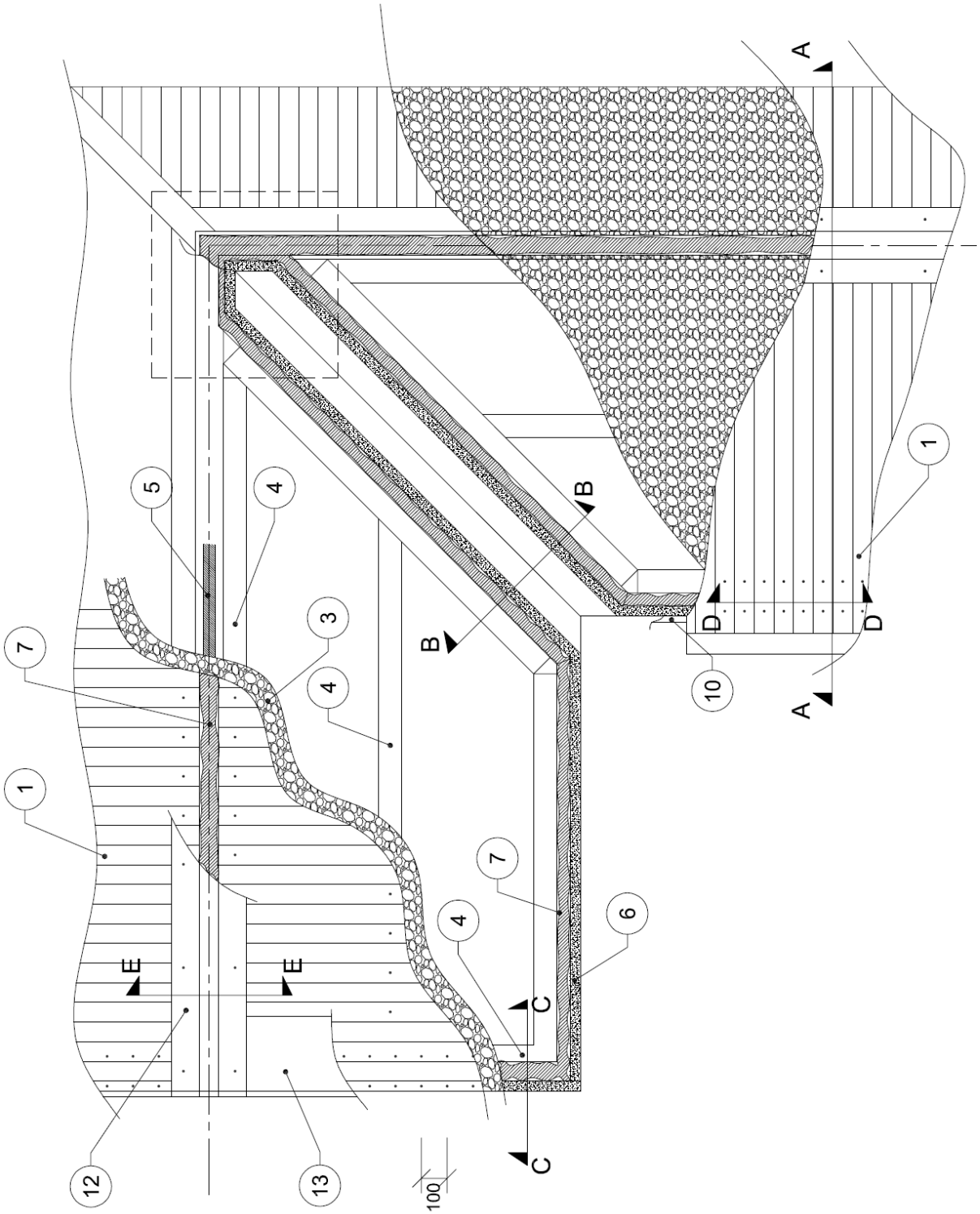


Figure 1 Example of Cut Away plan of a Typical Roof System Incorporating Ridge and Valley

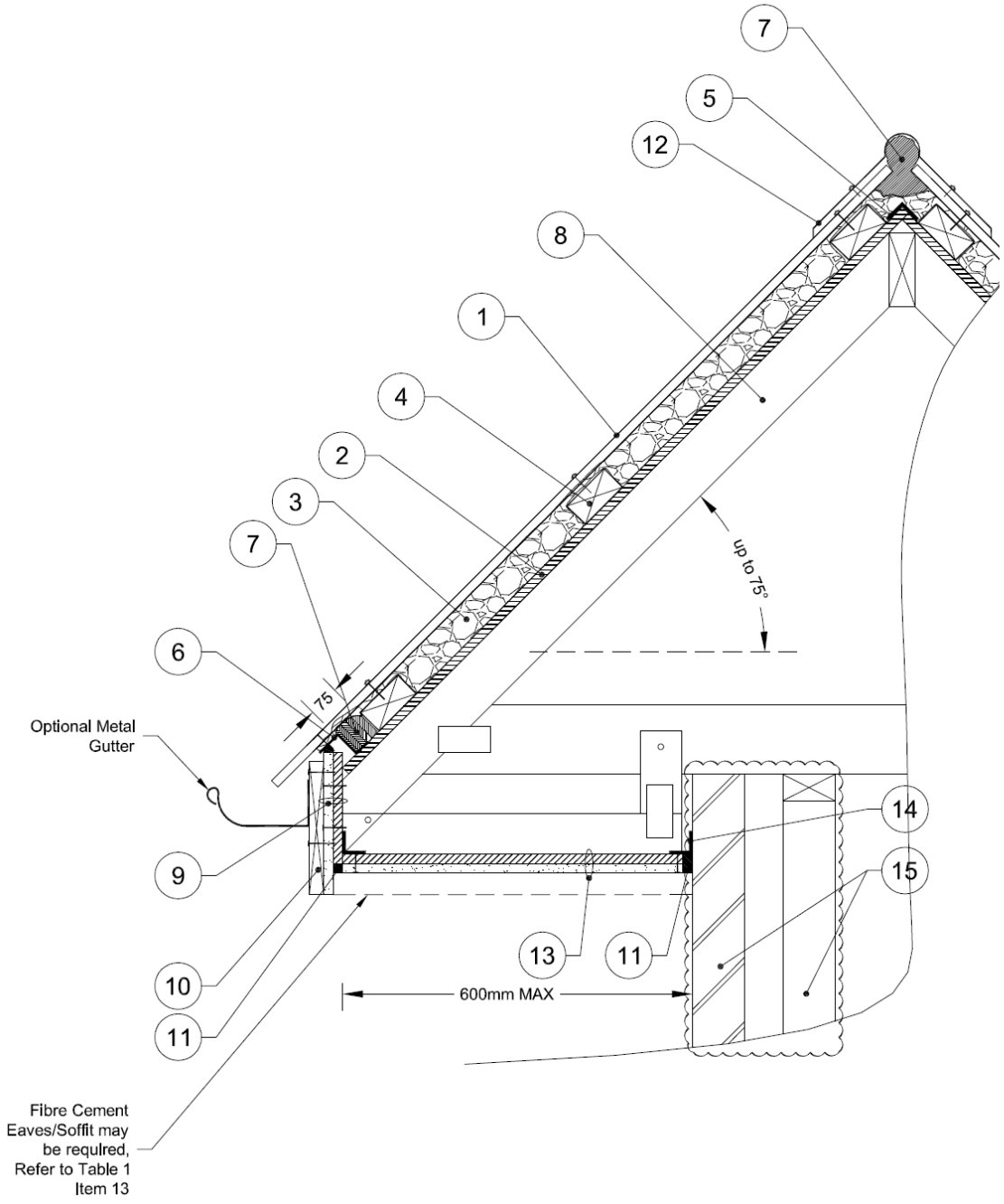
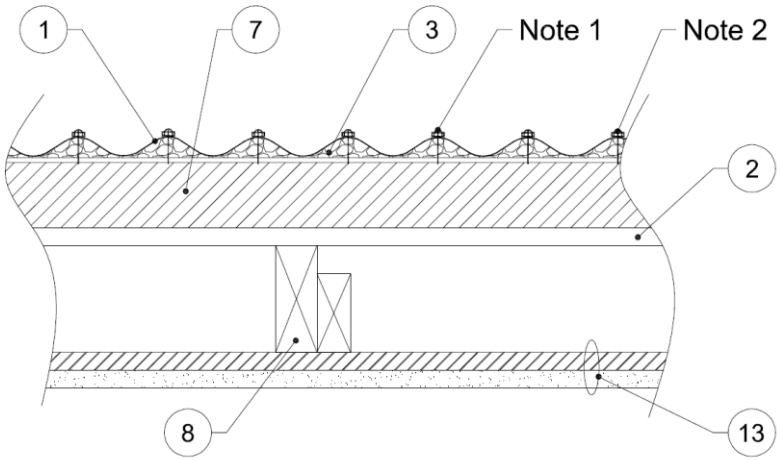


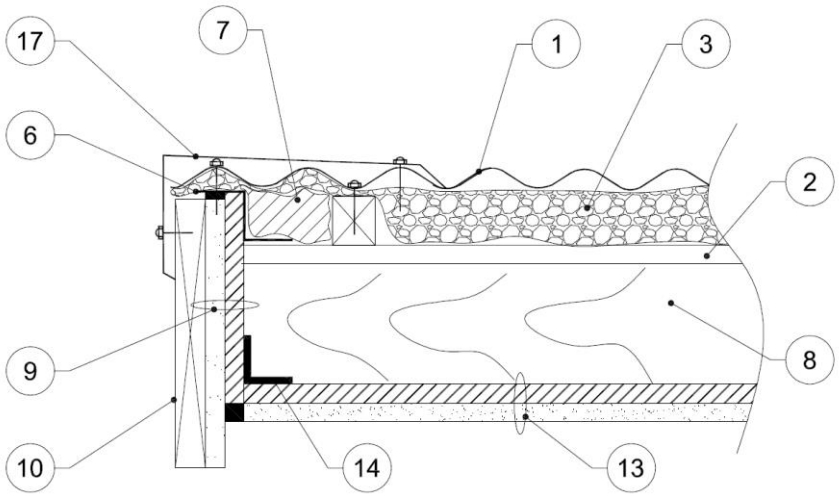
Figure 2 Example of Timber Frame Roof System (Section A-A)



Note 1 – Rockwool shall be installed such that the corrugations are fully filled with insulation.

Note 2- Fixings shall be installed into every crest and into battens and cavity

Figure 3 Example of Eave Detail (Section D-D)



Notes

Rockwool shall be installed such a that corrugations are fully filled with insulation

Rockwool shall be installed such a that corrugations are fully filled with insulation

Sheet fixings at edge shall be installed into crest or valley at 100mm centres to suit

Figure 4 Example of Barge and Gable Detail (Section C-C)

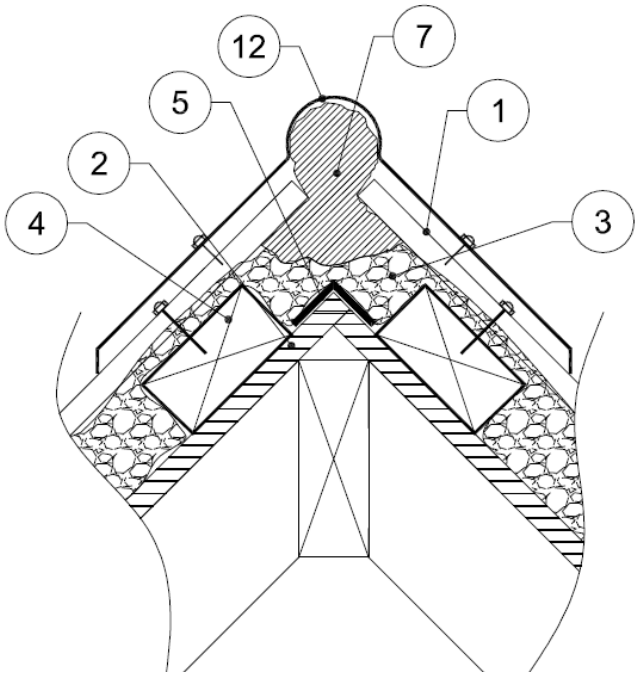


Figure 5 Example of Ridge or Hip Detail (Section E-E)

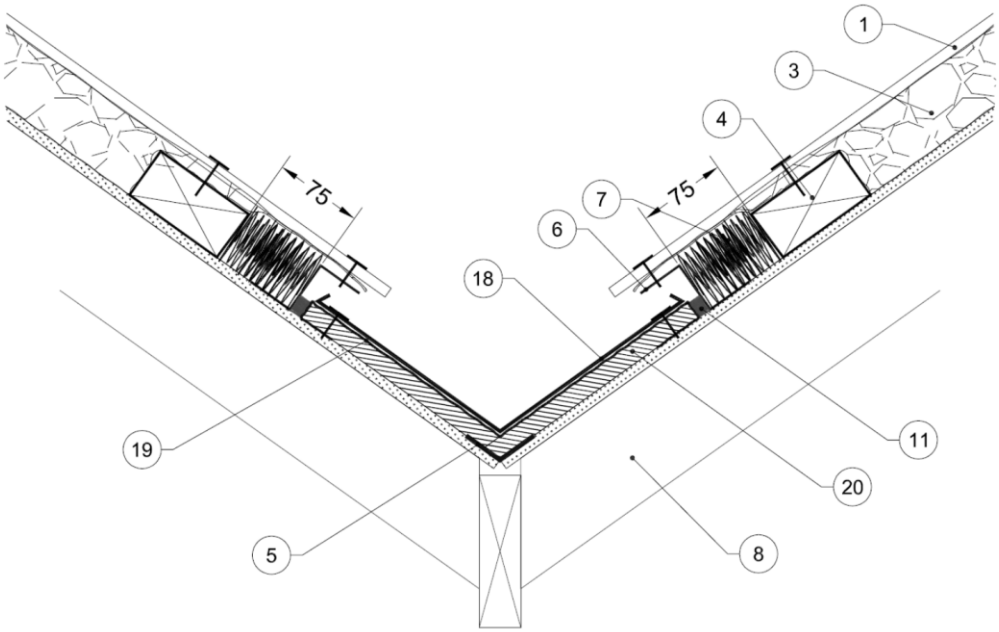


Figure 6 Valley construction Option 1 (Section B-B)

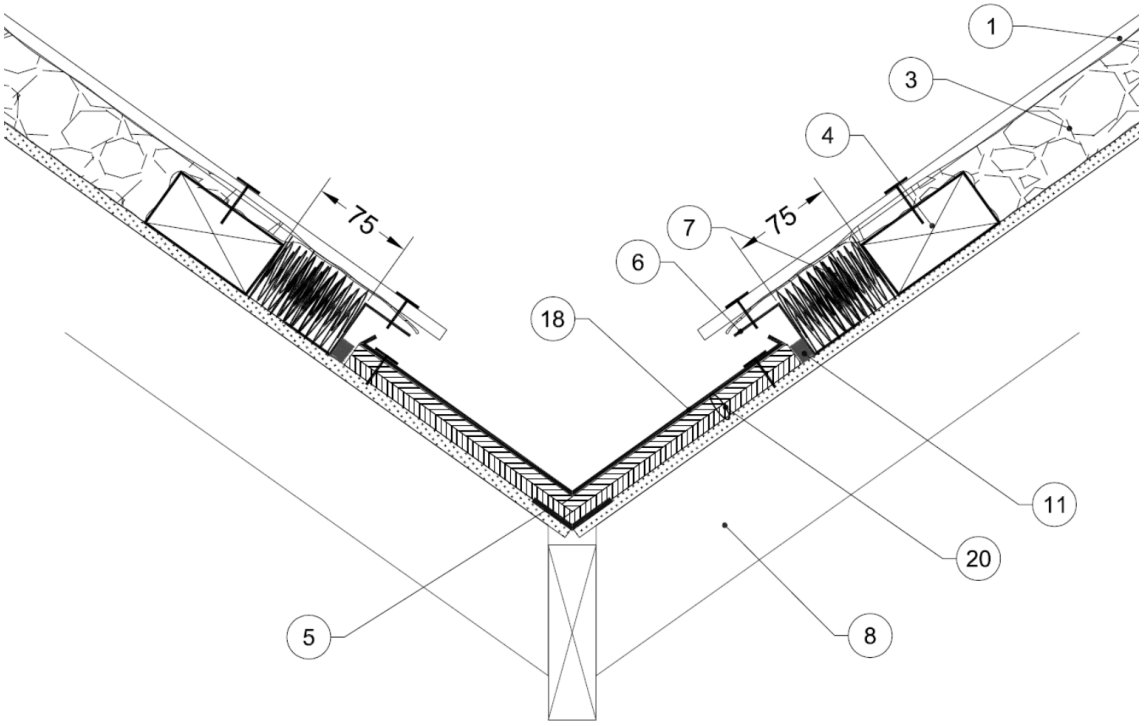


Figure 7 Valley construction Option 2 (Section B-B)

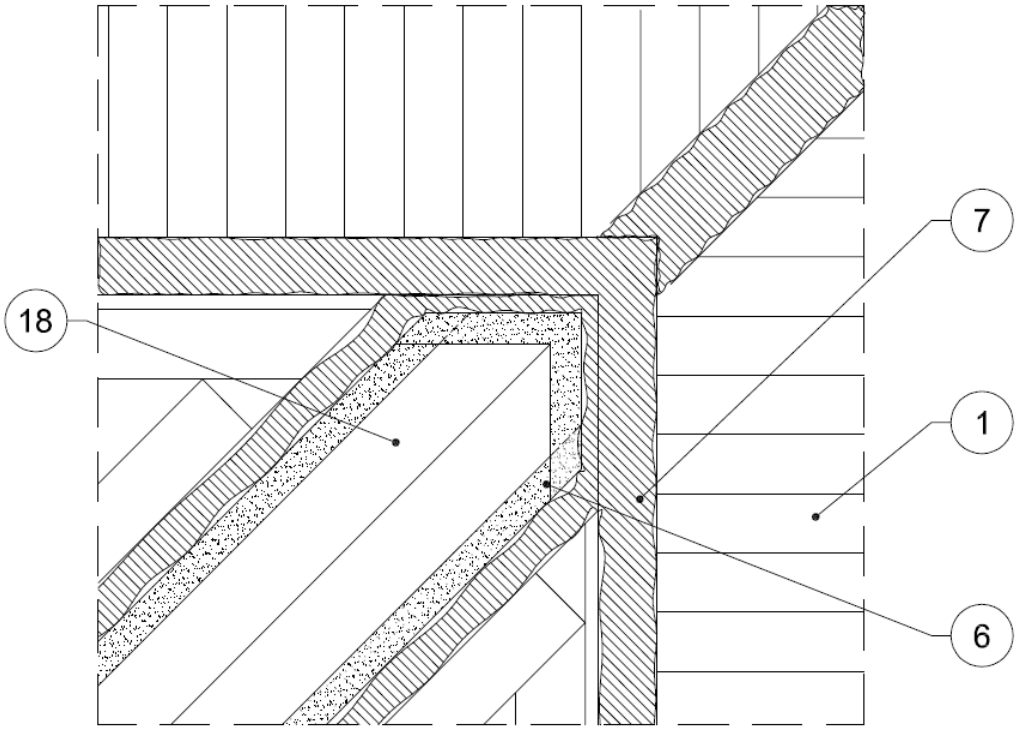


Figure 8 Example of Ridge and Hip Junction

4. Scope, objective and assumptions

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 3.2.
- This report details the methods of construction, test conditions and assessed results that would have been expected if the specific elements of construction described here had been tested in accordance with AS 1530.8.2-2007.
- The referenced assessment report is prepared with reference to the requirements of AS 1530.8.2-2007 section 16 and AS 1530.4:2014 as appropriate.
- The referenced assessment report is only valid for the assessed system/s. Any changes with respect to size, construction details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the findings of this assessment. If there are changes to the system, a reassessment will be needed to verify consistency with the assessment in this report.
- The referenced assessment report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.
- The application of the results of this assessment is to roof systems including fascia, eaves and valleys when exposed to the effects of bushfire from the outside as described in AS 1530.8.2-2007 Section 16.

5. Conclusion

Details of the assessment and discussion are only available in the referenced main assessment report. It has been conducted that the concrete and terracotta tile roof systems shown in Figure 1 to Figure 8 are likely to achieve a BAL-FZ classifications if it were tested in accordance with AS 1530.8.2-2007.

Table 6 Variations and assessment outcome

Product	Reference test	Figure reference	Variation	Assessment classification
Concrete and terracotta tile roof systems	EWFA 2368000, EWFA 2398800, BWA 2358300, and BWA 2367700	Figure 1 to Figure 8	A shown in Table 4	BAL-FZ

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of this assessment may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.

Due to the nature of fire testing and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The referenced assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that this report be reviewed on or, before, the stated expiry date.

The referenced assessment represents our opinion about the performance likely to be demonstrated on a test in accordance with AS 1530.8.2-2007, based on the evidence referred to in this report.

The referenced assessment is provided to the Forest and Wood Products Australia for its own purposes and we cannot express an opinion on whether it will be accepted by building certifiers or any other third parties for any purpose.