



## **REGULATORY INFORMATION ASSESSMENT REPORT**

An assessment of the bushfire attack level (BAL) performance of various concrete and terracotta tile roof systems if tested in accordance with AS 1530.8.2-2007 Section 16 (Flame Zone)

### **EWFA Report No:**

RIR 23987-04

### **Report Sponsor:**

Roofing Tile Association of Australia  
PO Box 275 St Leonards  
NSW 1590  
Australia

## DOCUMENT REVISION STATUS

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Date Issued	Issue No	Description
2/10/2009	RIR 23987-00	Initial Issue
6/10/2009	RIR 23987-01	Typographical amendment
15/11/2009	RIR 23987-02	Typographical amendment
21/03/2010	RIR 23987-03	Inclusion of terracotta tiles
06/12/2017	RIR 23987-04	Revalidation to extend validity for further 5 Years Update report sponsor address

## CONTACT INFORMATION

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## 1 INTRODUCTION

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This report supersedes RIR 23987-03 and contains the minimum information sufficient for regulatory compliance and refers to the Assessment report EWFA 23987-04.

The referenced report is an assessment of the bushfire attack level (BAL) performance of various concrete and terracotta tile roof systems if tested in accordance with AS 1530.8.2-2007 Section 16 (Flame Zone)

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

The tested systems are described in Section 2 and are to be subject to the design variations described in Section 3 and tested in accordance with the test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of this assessment is conditional on compliance with Sections 6, 7 and 8 of this report.

Refer to the referenced report for a summary of the test data.

## 2 TESTED PROTOTYPES

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The referenced assessment report makes reference to EWFA 23680-00.1 and EWFA 23988-00.1 being tests of concrete tile roof systems tested in accordance with AS 1530.8.2-2007. Supplementary reference was made to pilot scale tests in accordance with AS1530.4-2005 on parts of the roof systems incorporating concrete and terracotta tile in BWA 2358300, BWA 2367700 and EWFA 2434700. All tests were sponsored by the Roofing Tile Association of Australia, Refer to the referenced test reports for a detailed summary of the reference test data.

## 3 VARIATION TO TESTED PROTOTYPES

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This section sets out the proposed variations to the roof construction that are considered in this assessment.

The proposed construction shall be as tested in BWA 23680-00.1 and BWA 23988-00.1 with consideration given to the following variations:

- Variation in the profile and mass of the concrete or terracotta roof tiles from  $46\text{kg/m}^2$  to  $54\text{kg/m}^2$ .
- Variation in the mass of the roof cavity insulation from CSR Bradford Supertel (nominal mass  $32\text{kg/m}^3$ ) to CSR Bradford Flexitel (nominal mass  $24\text{kg/m}^3$ ).
- Inclusion of acceptable variations from AS1530.8.2-2007
- Framing may be trusses or rafters
- Framing may be steel in lieu of timber tested
- Truss or rafter spacing may be optionally less than 600mm or up to 900 mm in lieu of 600mm as tested
- Inclusion of typical barge, gable, hip, and valley details.

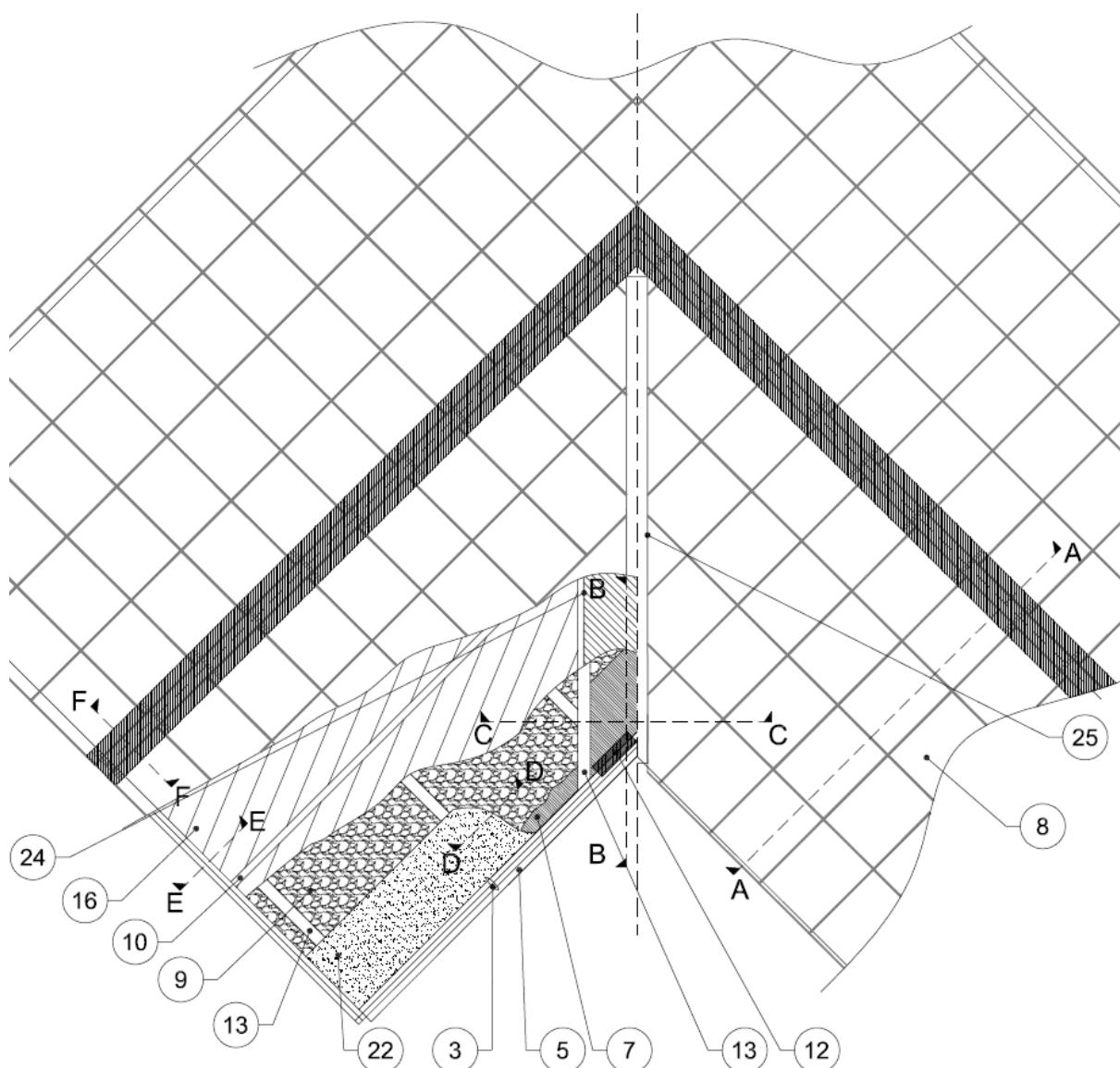
### 3.1 SUMMARY OF PROPOSED CONSTRUCTION

The proposed construction is shown in Figure 1 to 8 with the items defined in Table 1 below

ID	Description	
1	<b>Name</b>	<b>Sealant</b>
	<b>Material</b>	Bostik FIREBAN ONE Polyurethane sealant
	<b>Installation</b>	Installed into gap 8mm wide at the eaves/facia and eaves wall junction of the plasterboard Installed at the junction of the fascia and anti-ponding board
2	<b>Name</b>	<b>Framing Angle</b>
	<b>Size</b>	35mm x 35mm x 0.50bmt Galvanised Steel Angle
	<b>Installation</b>	Fixed to the truss along the wall/rafter interface, with the leg position downward capping the back edge of the eaves lining and located on the unexposed side of the plywood eaves/fascia interface.
3	<b>Name</b>	<b>Fascia Lining</b>
	<b>Linings</b>	16mm Boral Firestop plasterboard or 16mm CSR Fyrchek plasterboard over 15mm Pine Plywood
	<b>Installation</b>	<b>Plywood</b> fixed to rafters such that all joins fall on framing members or are backed with nogging. <b>Plasterboard</b> orientated so that butt joins do not fall on joins in plywood. Joins shall be left open and 6-10mm wide and gaps filled with sealant (item 1). Plasterboard to be fixed to plywood at 150mm centres at the top and bottom of the facia. Plasterboard to be fixed with 6g x 30mm plasterboard screws.
4	<b>Name</b>	<b>Roof Lining Fixings</b>
	<b>Material</b>	25mm x 2mm TITAGRIP Particleboard screws.
5	<b>Name</b>	<b>Fascia board</b>
	<b>Material</b>	Radiata Pine nominally 190mm high x 19mm thick and deep enough to fully cover the fascia linings.
	<b>Installation</b>	Positioned on the face of the plasterboard, fixed with 2x75mm nails into the ends of each rafter. Joints may be square cut butt joints unfilled.
6	<b>Name</b>	<b>Roof Lining</b>
	<b>Material</b>	15mm thick (minimum) Seasoned Pine plywood
	<b>Installation</b>	Plywood arranged such that all butt joins fall on framing and tongue and groove joints are not backed and run generally perpendicular to framing. Fixing of lining to framing shall be as for flooring accordance with timber framing code. Butt joints in sheets shall be backed by framing or additional nogging.
7	<b>Name</b>	<b>Cavity Closure Insulation</b>
	<b>Material</b>	Bradford Fibretex 650 Rockwool
	<b>Size</b>	115mm thick and 80kg/m <sup>3</sup> density(Measured)
		Nominal 100mm wide strip positioned at the roof/fascia interface either side of the valley gutter. The Rockwool was installed under the valley gutter (item 24) to a distance of between 120mm and 300mm from the fascia, as shown below.
8	<b>Name</b>	<b>Roof Tile</b>
	<b>Material</b>	Concrete and terracotta roof tiles shall be of various profiles in accordance with AS2049. The tile may vary in mass from 46kg/m <sup>2</sup> to 54kg/m <sup>2</sup> . The tile profile shall vary from curved to flat provided that the gap requirements of AS2049 Clause 5.3 are met when tested to AS 4046.1.
	<b>Installation</b>	Each tile shall be screw fixed or clip fixed to the tile batten (item 10).

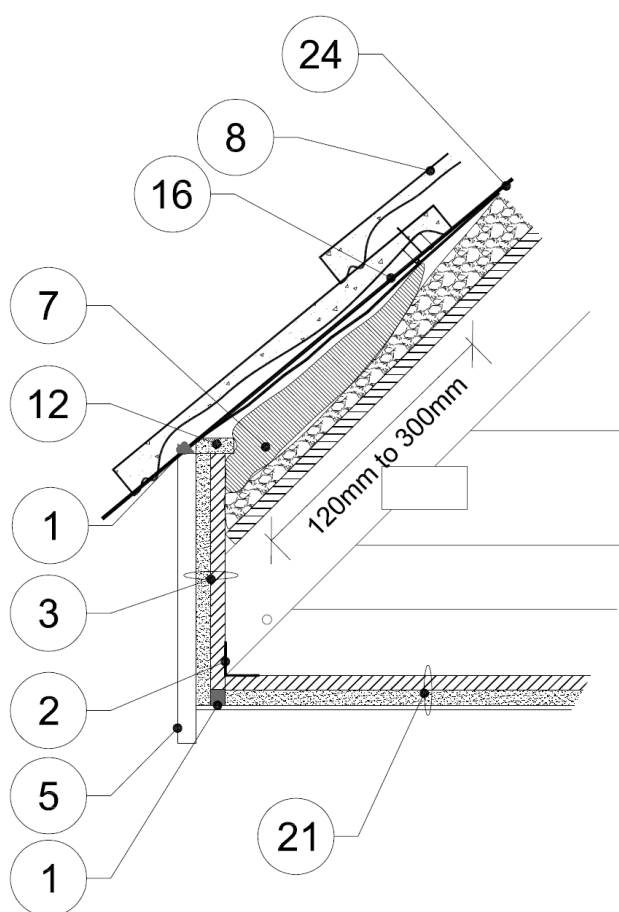
ID	Description	
9	<b>Name</b>	<b>Roof Cavity Insulation</b>
	<b>Material</b>	CSR Bradford Insulation Flexitel™ 38mm thick 24 kg/m³
	<b>Installation</b>	Positioned directly over the plywood under the counter battens (item 13) which are screw fixed to the plywood through the insulation. Positioned such that there are no visible gaps to plywood.
10	<b>Name</b>	<b>Roof Tile batten</b>
	<b>Material</b>	Light gauge steel nominally 25mm wide x 20mm high
	<b>Installation</b>	Designed for framing spacing and Fixed to roof framing in accordance with relevant structural standards.
11	<b>Name</b>	<b>Adjacent Wall Construction</b>
	<b>Material</b>	Wall construction that that has been tested or assessed in accordance with AS1530.8.2-2007 to meet a rating of BAL-FZ or a wall deemed BAL FZ in AS3959-2009.
12	<b>Name</b>	<b>Plasterboard Strip</b>
	<b>Material</b>	16mm CSR Fyrchek plasterboard or 16mm Boral Firestop Plasterboard installed between fascia linings and valley iron.
13	<b>Name</b>	<b>Counter batten</b>
	<b>Material</b>	40mm wide at the top, 95mm wide at the base which includes a nominal 14mm lip on each side, and 40mm high.
	<b>Installation</b>	Screw fixed to the plywood and framing below tabs using screws spaced at nominal 400mm centres or as required by relevant structural standards. Refer figure 2 & 3.
14	<b>Name</b>	<b>Roof framing</b>
	<b>Either</b>	
	<b>Material</b>	Timber
	<b>Size</b>	Solid Timber framing or timber trusses shall be sized in accordance with the relevant framing and design standards.
	<b>Installation</b>	Truss or rafter spacing may be optionally less than 600mm or up to 900mm
	<b>Or</b>	
	<b>Material</b>	Steel
	<b>Size</b>	Steel framing or steel trusses shall be designed in accordance with the relevant framing and design standards.
	<b>Installation</b>	Truss or rafter spacing may be optionally less than 600mm or up to 900mm
16	<b>Name</b>	<b>Sarking</b>
	<b>Material</b>	Enviroseal roof tile sarking 1350mm wide
	<b>Installation</b>	Installed over the entire roof system between the tile battens and the counter battens. It was terminated on each face at the edge of the valley gutter.
17	<b>Name</b>	<b>Steel angle</b>
	<b>Material</b>	Galvanised steel
	<b>Size</b>	35 x 35 x 0.70mm
	<b>Installation</b>	Fixed to the truss along the wall/rafter interface, with the leg position downward capping the back edge of the eaves lining.

ID	Description	
20	<b>Name</b>	<b>Ridge capping</b>
	<b>Material</b>	Concrete
	<b>Size</b>	440mm long x nominal 250mm wide x nominal 70mm high x nominal 15mm thick.
	<b>Installation</b>	Ridge capping installed over the ridge of the roof, with an approximate 20mm overlap from one ridge tile to the next and set –with item 23
21	<b>Name</b>	<b>Eaves Linings</b>
	<b>Material</b>	Fibre Cement sheet 4.5mm thick over 16mm Boral Firestop plasterboard (or 16mm CSR Fyrchek plasterboard) over 15mm Pine Plywood
	<b>Installation</b>	<p><b>Plywood</b> orientated so that all joints 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.</p> <p><b>Plasterboard</b> orientated so that butt joints do not fall on joints in plywood. Plasterboard to be fixed to plywood at 150mm centres at perimeter and rows 600mm centres apart with fixing at 200mm centre spacing in the field. Plasterboard to be fixed with 6g plasterboard screws.</p> <p>The Fibre Cement sheet was screw fixed to the trusses on the eaves on the exposed surface. The sheets were fixed with 6g x 45mm screws at nominal 200mm centres at the perimeter to the plywood.</p>
22	<b>Name</b>	<b>Anti-ponding board</b>
	<b>Material</b>	16mm CSR Fyrchek plasterboard or 16mm Boral Firestop Plasterboard
	<b>Size</b>	300mm wide x 16mm thick.
	<b>Installation</b>	The board was screw fixed to counter battens (item 13) over the Rockwool see figure 1 and 2
23	<b>Name</b>	<b>Bedding Mortar</b>
	<b>Material</b>	Cement 4:1
	<b>Size</b>	40mm thick
24	<b>Name</b>	<b>Valley Gutter</b>
	<b>Material</b>	Zincalume Steel nominally 0.7mm thick.
	<b>Size</b>	To suit roofing requirements. A nominal 8mm lip was formed at the edges of the valley gutter.
	<b>Installation</b>	Located within the valley formed in the specimen on top of the counter battens, as shown below. Secured to the counter battens with screws at nominal 300mm centres down each side.
25	<b>Name</b>	<b>Valley guard</b>
	<b>Material</b>	Zincalume Steel
	<b>Size</b>	60mm wide at the top, 80mm wide at the base x 65mm high, with a 40mm wide flange on each side with an 8mm lip on each edge of the flange.
	<b>Installation</b>	Installed on top of the valley gutter (item 24) as shown below.

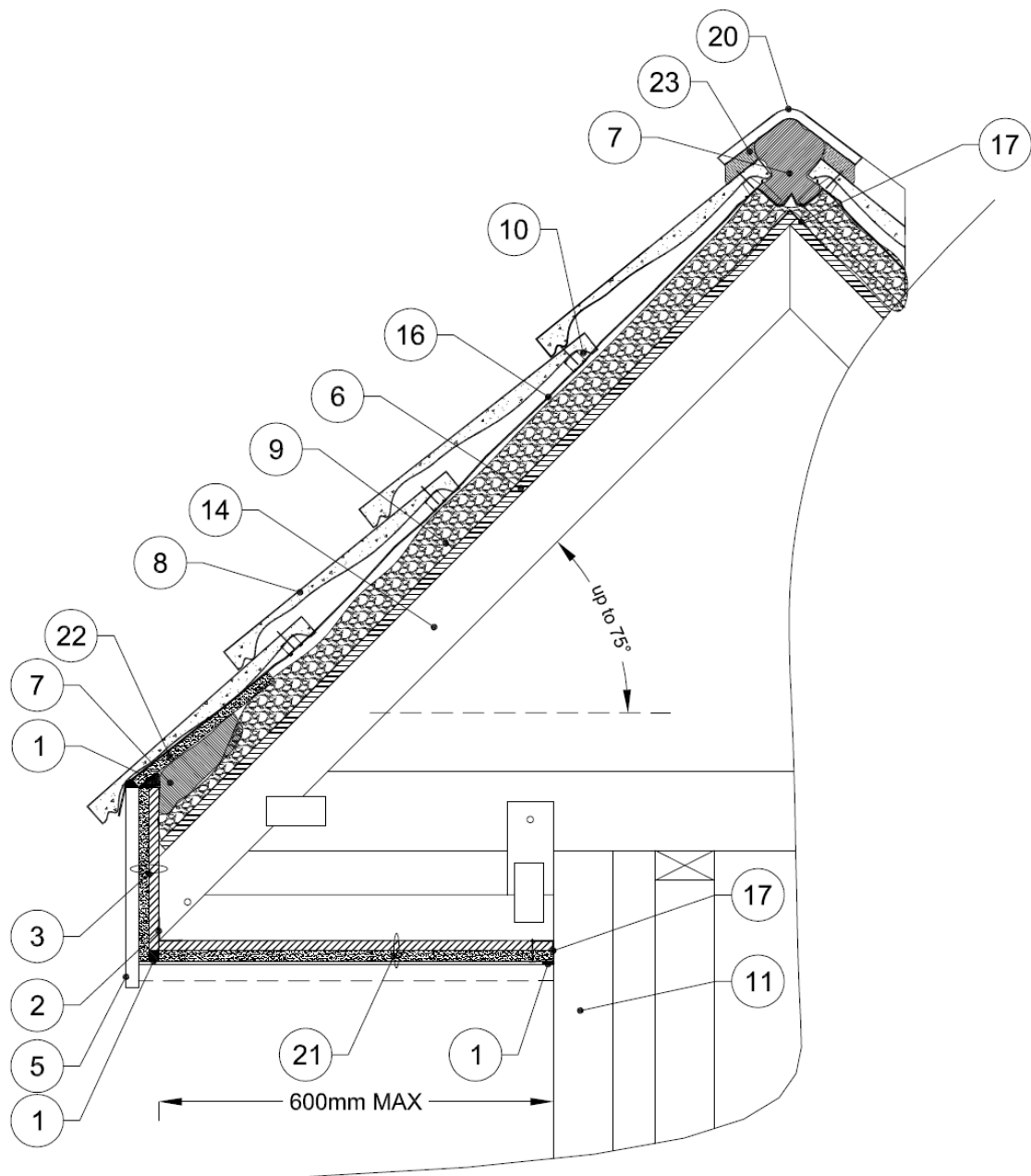


**Figure 1 – Example of Cut Away plan of a Typical Roof System Incorporating Ridge and Valley**

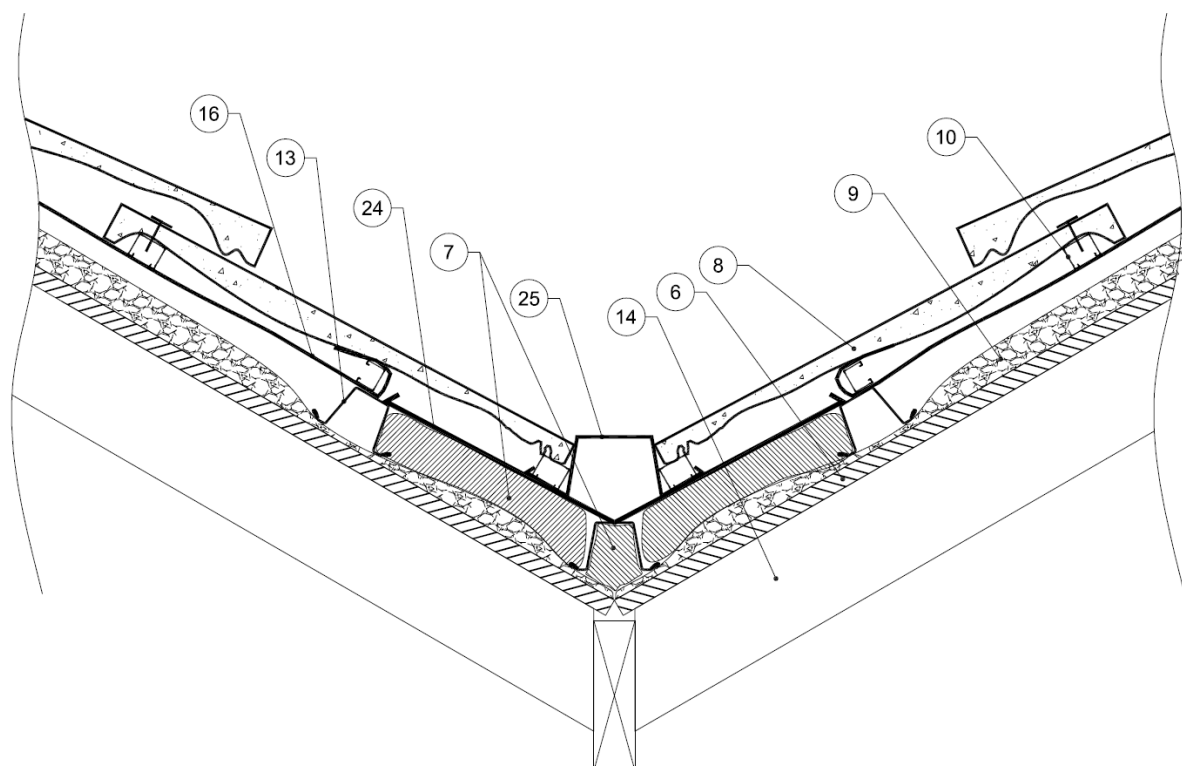




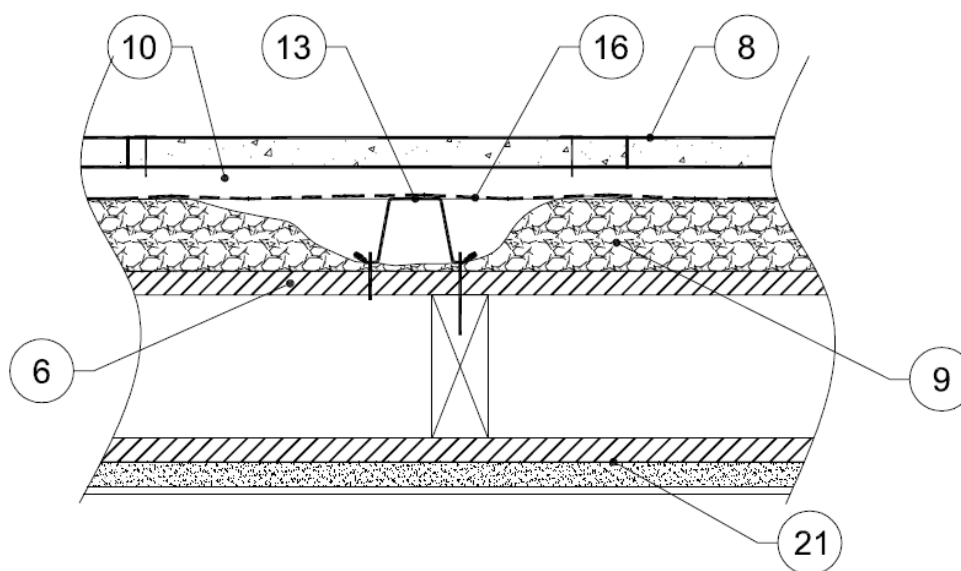
**Figure 2 – Section through Valley (Section B-B)**



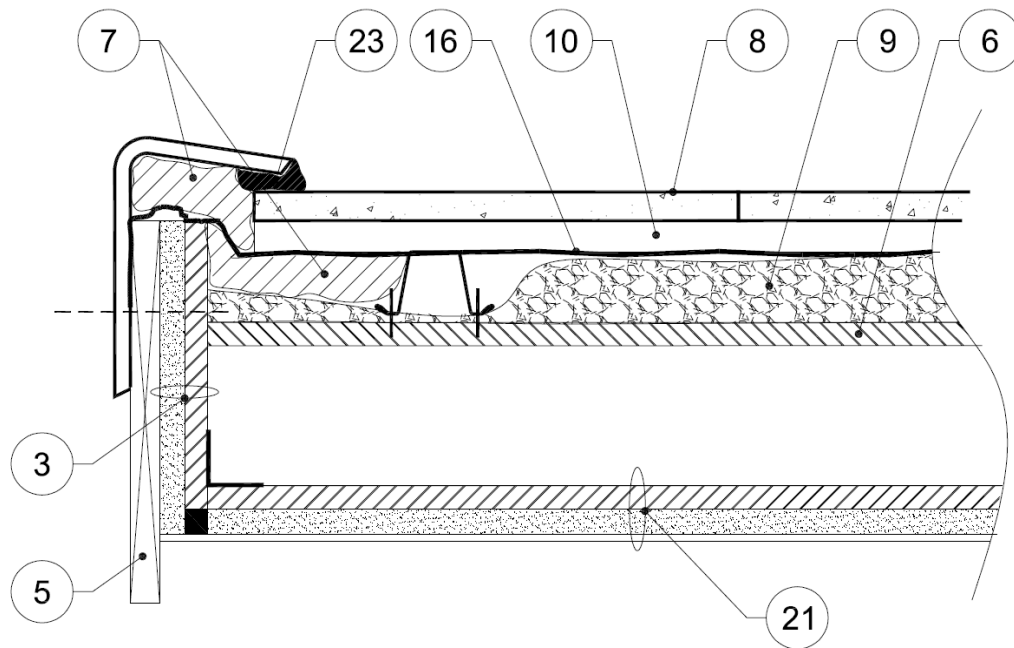
**Figure 3 – Example of Timber Frame Roof System (Section A-A)**



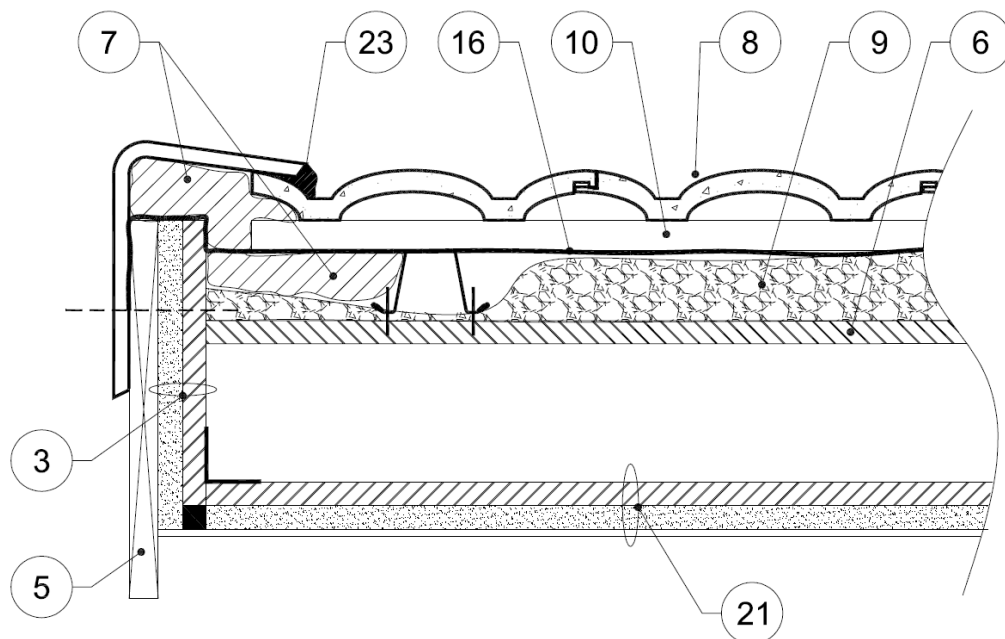
**Figure 4 – Example of Valley Detail (Section C-C)**



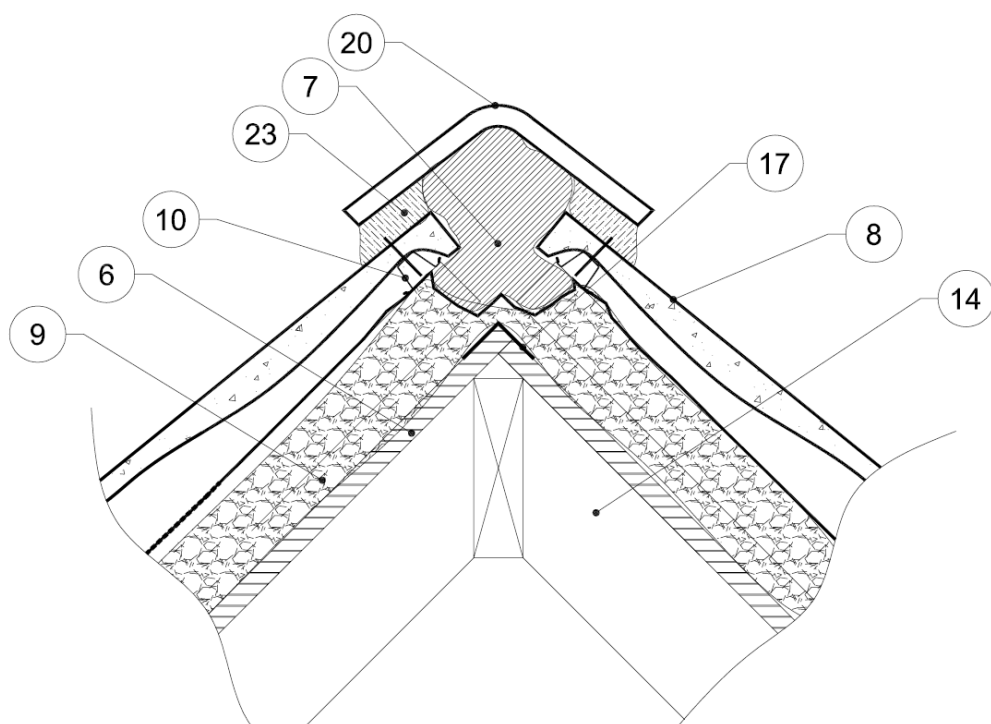
**Figure 5 – Example of Eave Detail (Section D-D)**



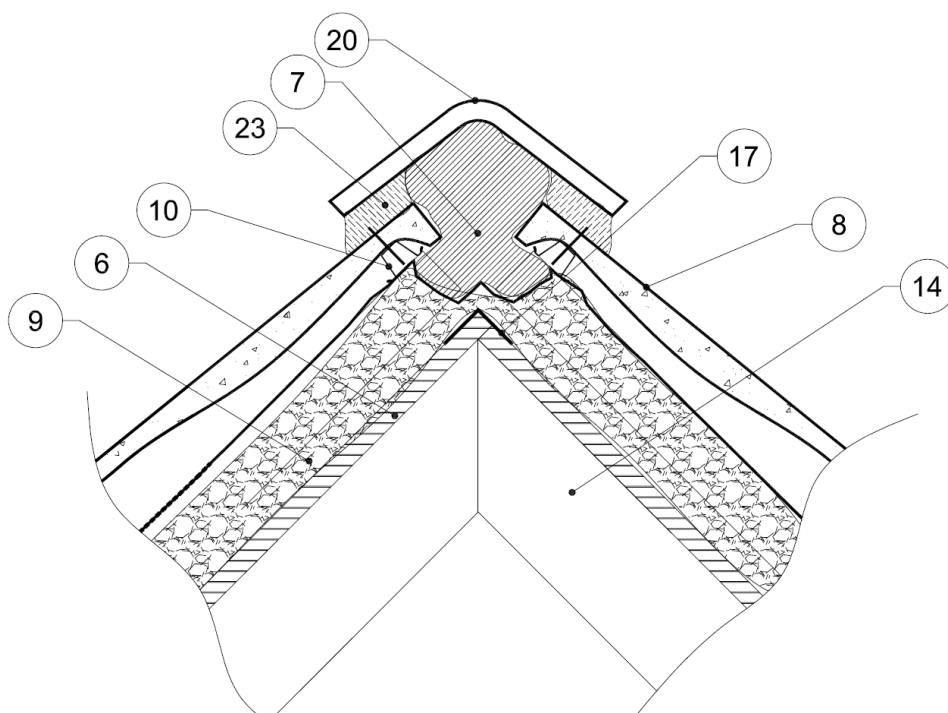
**Figure 6 – Example of Barge and Gable Detail (Section E-E)**



**Figure 7 – Example of Barge and Gable Detail (Section E-E)**



**Figure 8 – Example of Hip Detail**



**Figure 9 – Example of Ridge Detail**

## 4 REFERENCED TEST PROCEDURES

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This report is prepared with reference to the requirements of AS 1530.8.2-2007 section 16 and AS 1530.4-2005 as appropriate.

## 5 FORMAL ASSESSMENT SUMMARY

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Based on the discussion presented in the referenced report, it is the opinion of this registered testing authority that if the tested prototype described in Section 2 had been modified as described in Section 3, it would have been likely to achieve the bushfire attack level (BAL) as stated below if tested in accordance with the method referenced in Section 4 and subject to the requirements of Section 7.

**Assessed Performance - BAL-FZ**

## 6 DIRECT FIELD OF APPLICATION

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The application of the results of the referenced assessment is to roof systems including fascia and eaves when exposed to the effects of bushfire from the outside as described in AS 1530.8.2-2007 Section 16.

## 7 REQUIREMENTS

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The referenced report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS 1530.8.2-2007.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

## 8 VALIDITY

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The referenced report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of the referenced report may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire resistance 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 report can therefore only relate only to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

The referenced report 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 the subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in the referenced report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report.

All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

## **9 AUTHORITY**

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### **9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE**

By using this report as evidence of compliance or performance, the applicant(s) confirms 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, and
- they agree to withdraw this assessment from circulation should the component or element of structure be 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, and
- they are not aware of any information that could adversely effect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

### **9.2 GENERAL CONDITIONS OF USE**

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### **9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD**

Prepared by:



M.Akl

Reviewed by:



O. Saad

### **9.4 DATE OF ISSUE**

06/12/2017

### **9.5 EXPIRY DATE**

31/12/ 2022