



FIRE ASSESSMENT REPORT

FC17879-01-1

ASSESSMENT OF STRUCTURAL PANELS AUSTRALIA & TRIDEK ROOFING, TRIDEK SIPS CLASSIC, PRO, SMART AND ICON SERIES PANEL SYSTEMS FOR COMPLIANCE WITH BAL 12.5 TO BAL 40 RATING OF AS 3959:2018

CLIENT

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Australia



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ISSUE DATE:

3 July 2023

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ASSESSMENT OBJECTIVE

To assess Structural Panels Australia & Tridek Roofing, Tridek SIPs Classic, Pro, Smart and Icon series panel systems for compliance with BAL 12.5 to BAL 40 rating of AS 3959:2018 (Amdt 1 and 2).

CONCLUSION

It is considered that Structural Panels Australia & Tridek Roofing, Tridek SIPs Classic, Pro, Smart and Icon series panel systems comply with the BAL 12.5 to BAL 40 rating of AS 3959:2018 (Amdt 1 and 2) in that the roof sheet is deemed non-combustible and roof/wall or roof/roof junctions are sealed with a non-combustible (steel sheet) flashing and ventilation openings comply with clause 5/6/7/8.6.1 (c) of that standard. In addition, any additional construction associated with the roof construction must be complied with such as:

- for BAL 40,
 - Roof-mounted evaporative coolers are excluded.
 - Construction requirements for the framing of verandas, decks, ramps or landings.
- For BAL 29,
 - Pipes or conduits that penetrate the roof covering shall be non-combustible.
 - Evaporative coolers are permitted provided that they comply with AS/NZS 60335.2.98.
 - Construction requirements for the framing of verandas, decks, ramps or landings
- For BAL 12.5, to 19,
 - Evaporative coolers are permitted provided that they comply with AS/NZS 60335.2.98.
 - Construction requirements for the framing of verandas, decks, ramps or landings.

LIMITATION

This report is subject to the accuracy and completeness of the information supplied.

BRANZ reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved.

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The results reported here relate only to the item/s described in this report.



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DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
01	3 July 2023	Initial Issue



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1. INTRODUCTION

This report gives BRANZ's assessment of Structural Panels Australia & Tridek Roofing, Tridek SIPs Classic, Pro, Smart and Icon series panel systems for compliance with BAL 12.5 to BAL 40 rating of AS 3959:2018.

2. BACKGROUND

Structural Panels Australia & Tridek Roofing manufactures panel systems described as Tridek SIPs Classic, Pro, Smart and Icon series. The systems comprise steel sandwich panels with an expanded polystyrene (EPS) core up to 300 mm thick. The systems differ in the external weather sheet steel profile, Classic Series being a rounded corrugated style, Pro, Smart and Icon Series a trapezoidal style. Sheet facings may be Colorbond®, Zinalume or other steel roof sheeting of no less than 0.42 mm BMT and with a coating no greater than 10 µm backing coat and primer, and 27 µm finish coat and primer. There is a steel end cap and Colorbond® 'Z' fascia encapsulating the EPS core. The panel profiles are shown in Figure 1.

Structural Panel Australia & Tridek Roofing has requested that BRANZ assess these systems for compliance with a BAL 12.5 to BAL 40 rating as specified in AS 3959:2018.

Drawings supplied by Structural Panel Australia & Tridek Roofing, and held in BRANZ confidential files, Judgeford, New Zealand, show details of the roofing systems.

3. DISCUSSION

3.1 BAL 40 AS 3959:2018 (Amdt 1 and 2)

The BAL 40 specification of AS 3959:2018 (Amdt 1 and 2), clause 8.6.1 are as follows:

- (a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.*
- (b) The roof/wall and roof/roof junction shall be sealed either by the use of fascia and eaves linings or by sealing between top of the wall and the underside of the roof and between rafters at the line of the wall. They shall also be protected in accordance with Clause 3.6.*
- (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 conforming with Clause 3.6 (maximum aperture of 2 mm), made of corrosion-resistant steel or bronze.*
- (d) Roof-mounted evaporative coolers are not permitted.*

Furthermore, the standard states in clause 8.6.3 that, as appropriate to the Structural Panels Australia & Tridek Roofing systems:

"Sheet roofs shall -

(b) have any gaps sealed at the fascia or wall line hips and ridges by—

- (i) a mesh or perforated sheet that conforms with Clause 3.6 (maximum aperture of 2 mm), and that is made of corrosion-resistant steel or bronze; or*
- (ii) mineral wool; or*
- (iii) other non-combustible material; or*
- (iv) a combination of any of Items (i), (ii), or (iii) above.*



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3.2 Non-Combustible

Non-combustible is defined in AS 3959:2018 as:

Not deemed combustible as determined by AS 1530.1 or not deemed combustible in accordance with the BCA.

The Building Code of Australia (BCA), or National Construction Code Parts 1 and 2, state that the following material though combustible or containing combustible fibres, may be used wherever a non-combustible material is required:

Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.

From the Colorbond® manufacturer's literature the upper sheet steel has a surface finish not exceeding 1 mm and a Spread-of-Flame Index of 0, therefore the product meets the AS 3959:2018 definition of a non-combustible material.

3.3 AS 3959:2018 Sheet Roofs

Roof/wall and roof/roof junctions shall be sealed to limit gaps under corrugations or ribs of sheet roofing and gaps between roof components sealed at the fascia or wall line and at valleys, hips and ridges.

The Structural Panels Australia & Tridek Roofing panel systems include end cap flashings which will seal the EPS. Where ventilation openings exist they will comply with Clause 8.6.1 (c) as identified in Section 3.1.

3.4 Features Contributing to the BAL Rating

The Structural Panels Australia & Tridek Roofing panel systems have features which are considered to enable them to achieve up to a BAL 40 rating. These are:

1. The panels are stitched together with 10g x 16 mm Tek screws at the outer sheet overlaps and with AS4-3 Aluminium or steel dome head rivets at the inner sheet underlaps, both at 300 mm centres as typically shown in Figure 2.
2. There is a steel end cap, ridge cap and steel 'z' fascia encapsulating the EPS core.
3. There is a non-combustible mineral wool barrier at the leading edges and immediately behind side, ridge and end cap flashings as shown in Figure 3. The mineral wool will contain any molten EPS and prevent flaming on the unexposed face.

The fixings and overlap of the outer sheets are expected to retain the sheets together. The outer sheets are expected to partially detach from the core, however from the fixings on both the inner and outer sheets, and that at a BAL 40 rating the EPS is expected to remain bonded to the inner sheet, the Structural Panels Australia & Tridek Roofing roof systems are not expected to collapse in a manner that would be detrimental to achieving at least a BAL 40.



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3.5 Constructional Features

AS 3959:2018 gives specifications for various constructional features which are peripheral to the assembly of the Structural Panels Australia & Tridek Roofing panel systems. The relevant aspects are those relating to the make-up of the roofing system as specified in clauses 8.6.1 and 8.6.3, as discussed above. As the Structural Panels Australia & Tridek Roofing panel systems form part of a complete building construction, other aspects such as those specified in clauses 8.6.4 relating to veranda, carport and awning roofs must be complied with.

3.6 BAL-12.5, BAL-19 and BAL 29 AS 3959:2018 (Amdt 1 and 2)

In accordance with Section 3.4 of AS 3959:2018 AS 3959:2018 (Amdt 1 and 2), as the above discussion considers that Structural Panels Australia & Tridek Roofing panel systems comply with a BAL 40 rating it is considered that they would also comply with BAL-12.5, BAL 19 and BAL-29 ratings.

For these BAL ratings, evaporative coolers are permitted provided that they comply with AS/NZS 60335.2.98. Furthermore, evaporative coolers provided with an internal damper to prevent ingress of embers into the roof space do not require external screening.

The BAL 29 rating also requires that a pipe or conduit penetration be non-combustible.

4. CONCLUSION

It is considered that Structural Panels Australia & Tridek Roofing, Tridek SIPs Classic, Pro, Smart and Icon series panel systems comply with the BAL 12.5 to BAL 40 rating of AS 3959:2018 (Amdt 1 and 2) in that the roof sheet is deemed non-combustible and roof/wall or roof/roof junctions are sealed with a non-combustible (steel sheet) flashing and ventilation openings comply with clause 5/6/7/8.6.1 (c) of that standard. In addition, any additional construction associated with the roof construction must be complied with such as:

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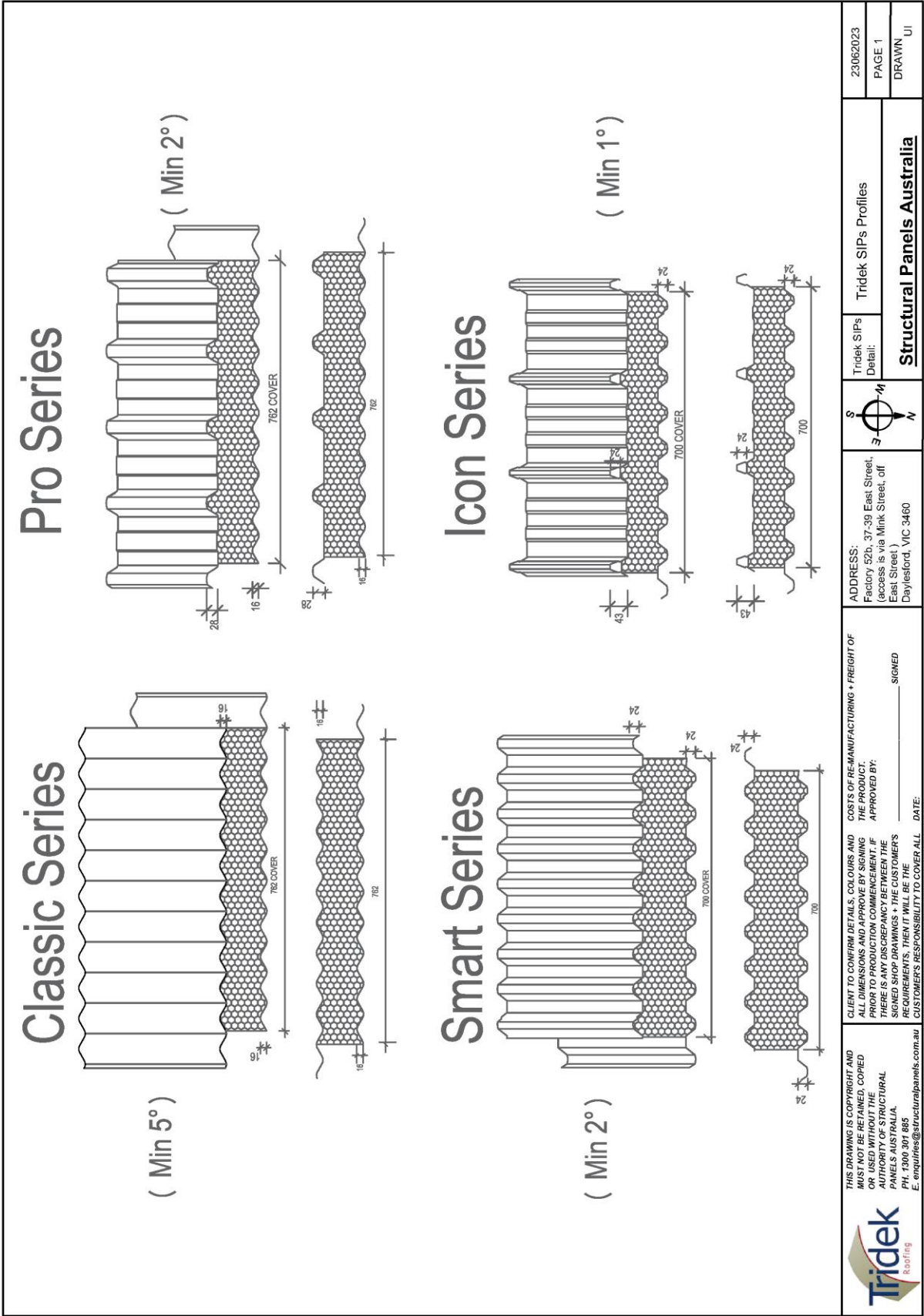
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Figure 1: Client Supplied Drawing - Panel Profiles



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Figure 2: Client Supplied Drawing - Typical Sheet Fixing

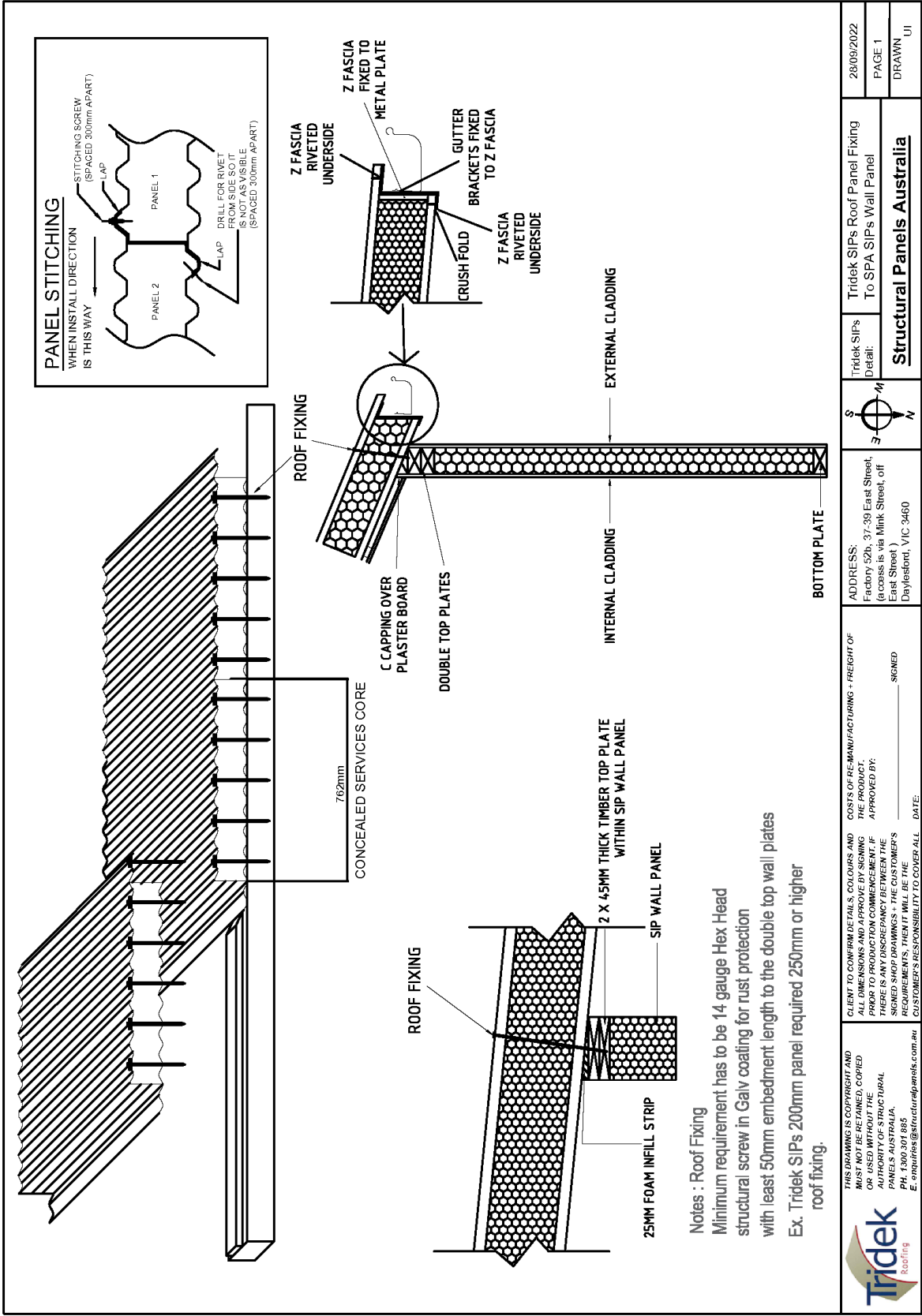


Figure 3: Client Supplied Drawing - Typical Endcap Detail.

