REGULATORY INFORMATION REPORT

An assessment of the fire resistance of
CSR Hebel external wall panels if tested
in accordance with AS1530.4-2005.

EWFA Report No:

RIR 24648-07

Report Sponsor:

CSR Panel Systems
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Testing. Advising. Assuring.

DOCUMENT REVISION STATUS

Date Issued	Issue No	Description
04/6/2010	RIR 24648-00	Initial Issue
26/10/2010	RIR 24648-01	Revised to include 125mm panel system
03/3/2014	RIR 24648-02	Revision to correct typographical error
02/06/2014	RIR 24648-03	Revised to include Hebel® Mortar
17/02/2015	RIR 24648-04	Revised to include Hebel® Service Panels and reduce cover to bolts
09/10/2015	RIR 24648-05	Revised to include Hebel Panel bolt shielding detail
1/07/2016	RIR 24648-06	Revised to include nil profile panels
20/07/2016	RIR 24648-07	Revised to correct typographical error

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1 INTRODUCTION

This report contains the minimum information sufficient for regulatory compliance in accordance with AS1530.4-2014 Clause 2.16.3 and refers to the Assessment Report EWFA 24648-06.

The referenced assessment report (EWFA 24648-07) presents an assessment of the fire resistance of CSR Hebel external wall panels if tested in accordance with AS1530.4-2005.

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

2 TESTED PROTOTYPES

The referenced assessment report is based on fire resistance tests FSV 0081, FSV 0093, FSV 0221, and WFRA 41154.3.

The test specimen reported in FSV 0081 comprised a non-loadbearing wall system, constructed from horizontally laid panels. The specimen was tested in accordance with AS1530.4-1990 and sponsored by CSR Hebel Australia Pty. Ltd.

The test specimen reported in FSV 0093 comprised a load bearing wall system, constructed from autoclaved aerated concrete blocks. The specimen was tested in accordance with AS1530.4-1990 and sponsored by CSR Hebel Australia Pty. Ltd.

The test specimen reported in FSV 0221 comprised a non-loadbearing wall system, constructed from vertical panels of reinforced autoclaved aerated concrete panels. The specimen was tested in accordance with AS1530.4-1990 and sponsored by CSR Hebel Australia Pty. Ltd.

The test specimen reported in WFRA 41154.3 comprised two sections of wall designated Partitions A and B. The specimen was tested in accordance with AS1530.4-1997 with supplementary reference to a 30 second cotton pad test and was sponsored by CSR Hebel.

The test specimen reported in FSV 0979 comprised a non-loadbearing wall system, constructed from vertically laid panels. The specimen was tested in accordance with AS1530.4-1997 and sponsored by CSR Hebel.

The assessment also reference to test reports 2805200.3 and 2793500.2 being tests of a 150mm thick Hebel® tongue and groove wall panel system and a 75mm thick Hebel® tongue and groove panel ceiling system respectively. Both were tested in accordance with BS EN 1364-1: 1999 and exposed to the Hydrocarbon Modified (HCM) fire curve as defined in French inter Ministry circular No. 2000-63 of 25 August 2000.

The tests were sponsored by CSR Hebel and undertaken by Exova Warringtonfire Aus Pty Ltd.

3 VARIATION TO TESTED PROTOTYPES

The proposed construction for 150mm panels shall be as tested in FSV 0081 with the following additional variations:

- Panels are laterally supported at each column as described in Figure 1 to Figure 4.
- Panel length may be up to 6.0m.
- Panel wall systems may be up to 6.0m high. Panels may be thicker, though reinforcement depth may not decrease.
- Panels may be connected to structure with Hebel® tension ties or recessed bolts or bolts shielded with a section of Hebel Powerpanel or Powerpanel XL.
- The wall shall include horizontally orientated service panel type 1 and 2 within walls with fire exposure from one side only.
- The wall shall optionally include horizontally orientated service panel type 2 as an isolated element that supported from below with exposure on three sides.
- Service panel type 1 is 400mm wide × 600mm high panels with 2 × Ø200mm penetration for service conduit.
- Service panel type 2 is 350mm wide × 600mm high panels with 2 × Ø150mm penetration for service conduit.
- 150mm panel edge profile shall be either tongue and groove or nil profile.
- The horizontal joints between horizontal panels shall be filled with Hebel adhesive.
- The vertical butt joints between service panels filled with a minimum 100mm deep Kaowool and faced with minimum 16mm CSR Fireseal sealant.
- The entry and exist of the conduits in the walls are excluded in the scope of the assessment; any such penetrations shall be verified by testing to not exceed the enclosure temperatures stated in the report.

The proposed construction for 125mm panels shall be as tested in FSV 0221 with the following additional variations:

- Panels are laterally supported at each column as described in Figure 1 to Figure 4.
- Panel length may be up to 6.0m.
- Panel wall systems may be up to 6.0m high. Panels may be thicker, though reinforcement depth may not decrease.
- Panels may be connected to structure with Hebel® tension ties or recessed bolts or bolts shielded with a section of Hebel Powerpanel or Powerpanel XL.
- The wall shall include horizontally orientated service panel type 1 and 2 within walls with fire exposure from one side only.
- The wall shall optionally include horizontally orientated service panel type 2 as an isolated element that supported from below with exposure on three sides.
- Service panel type 1 is 400mm wide × 600mm high panels with 2 × Ø200mm penetration for service conduit.
- Service panel type 2 is 350mm wide × 600mm high panels with 2 × Ø150mm penetration for service conduit.
- The horizontal joints between horizontal panels shall be filled with Hebel adhesive.
- The vertical butt joints between service panels filled with a minimum 100mm deep Kaowool and faced with minimum 16mm CSR Fireseal sealant.
- The entry and exist of the conduits in the walls are excluded in the scope of the assessment, any such penetrations be verified by testing to not exceed the enclosure temperatures stated in the report.

The proposed construction is summarised in Table 1 below and Figures 1 to 17.

Table 1 – Schedule of Components for Proposed Construction

ID	Item	Description
1	Name	**Hebel® Autoclaved Aerated Concrete Panels**
	Size	Nominally 150mm thick x 600mm wide.
	Installation	Panels orientated horizontally and fixed to structure at the panel ends. *Tongue and Groove Profile:* Panels keyed together with tongue and groove system and filled with Hebel thin bed adhesive. *Nil Profile:* Butt join with maximum 3 mm gap filled with Hebel thin bed adhesive applied to full depth of panel.
2	Name	**Sealant**
	Material	External grade fire rated sealant capable of maintaining integrity of joint for up to -/240/240 if tested in accordance with AS1530.4-2005
	Installation	Installed over backing rods at vertical joins in panels at panel supports. See figure 1 to Figure 4
3	Name	**Floor Structure**
	Material	Concrete floor slab as per engineer's specifications
4	Name	**Wall Structure**
	Material	Concrete/masonry wall to engineer's specifications
5	Name	**Column**
	Material	Steel or concrete columns as per engineer's specifications
6	Name	**Hebel® Thin Bed Adhesive**
	Material	Proprietary Cementitious adhesive
	Installation	Applied to all horizontal joints and a thickness of nominally 3mm to full depth of panel.
7	Name	**Hebel® Tension ties**
	Material	Galvanised steel
	Installation	Clip fits around flange of column or Support bracket (item 8) and is fixed into panels at the joint with Hebel® V-nails as per engineer's specifications
8	Name	**Support Bracket**
	Material	100mm × 100mm × 6mm mild steel angle
	Installation	Bolted to support structure in accordance with engineer's specifications
9	Name	**Panel Bolt**
	Size	Mild Steel bolt M10 to M16 with a 50mm x 50mm x 4 mm square steel washers.
	Installation	Bolt is recessed into panel to a specific depth and the recess is backfilled with item 14 Or Bolt is shielded with section of Hebel Powerpanel or Powerpanel XL (item 17)
10	Name	**Z-Clip**
	Size	Mild steel Z-Clip. Size and thickness in accordance with engineer's specification.
	Installation	Clip bolted panel with item 9, to connect panel to column (item 5) or bracket (item 8)
11	Name	**Concrete Anchor**
	Installation	Design to suit applied loads in accordance with engineer's specifications
12	Name	**Steel Angle**
	Material	50mm x 50mm x 0.7mm Mild steel angle

ID	Item	Description
13	Name	**Hebel FB 8 Bracket**
	Material	125mm x 50mm slotted bracket
14	Name	**Patching For Recessed/Shielded Fixings**
	Material	CSR Fireseal Sealant or Hebel Adhesive
15	Name	**Hebel® Autoclaved Aerated Concrete Panels**
	Size	Nominally 125mm thick x 600mm wide.
	Installation	Panels incorporating keyed together with tongue and groove system and installed using thin bed adhesive. Panels orientated horizontally and fixed to structure at the panel ends
16	Name	**Hebel® Mortar**
	Installation	Applied to the base of the wall to fully fill panel tongue and groove profile.
17	Name	**Panel Bolt Shield**
	Material	75mm Hebel Powerpanel or Powerpanel XL
	Size	300mm x 300mm x 75mm thick (minimum)
	Installation	Positioned over the panel bolt (item 9) with minimum 75mm between bolt and edge of Powerpanel section. CSR Fireseal Sealant or Hebel Adhesive to fill gap under Powerpanel and around bolt head.
	Fixing	Screw fixed to underlying Hebel panel with 14-10x150mm hex head screws minimum 100mm from edge and 150mm spacing for 300mm x 300mm panel or 400mm vertically, minimum 2 per panel.
18	Name	**Kaowool**
	Material	Ceramic fibre
	Size	100mm x 15-40mm
	Installation	Fitted between section of service panel as a gasket around collar

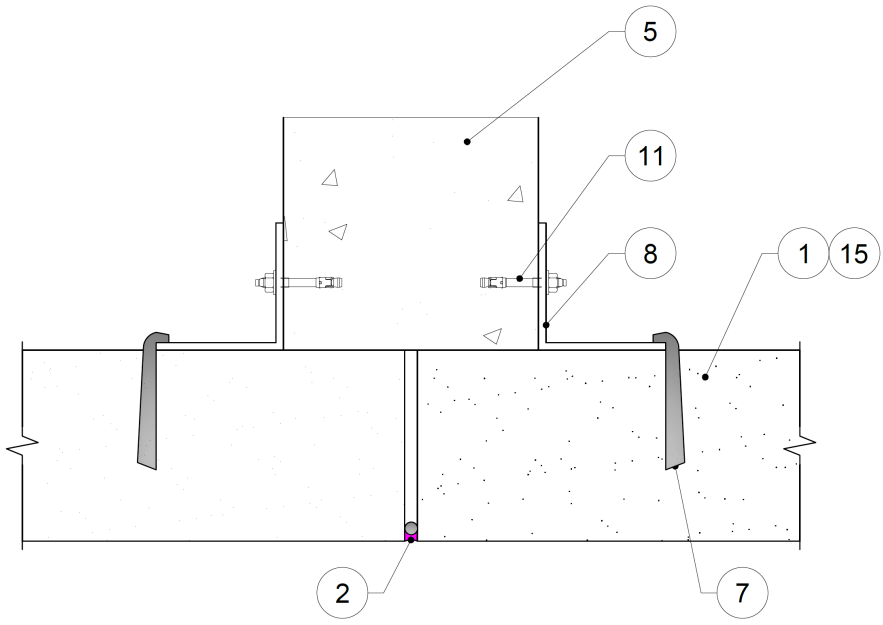

Figure 1 – Plan Section at Vertical Concrete Column – Hebel Ties

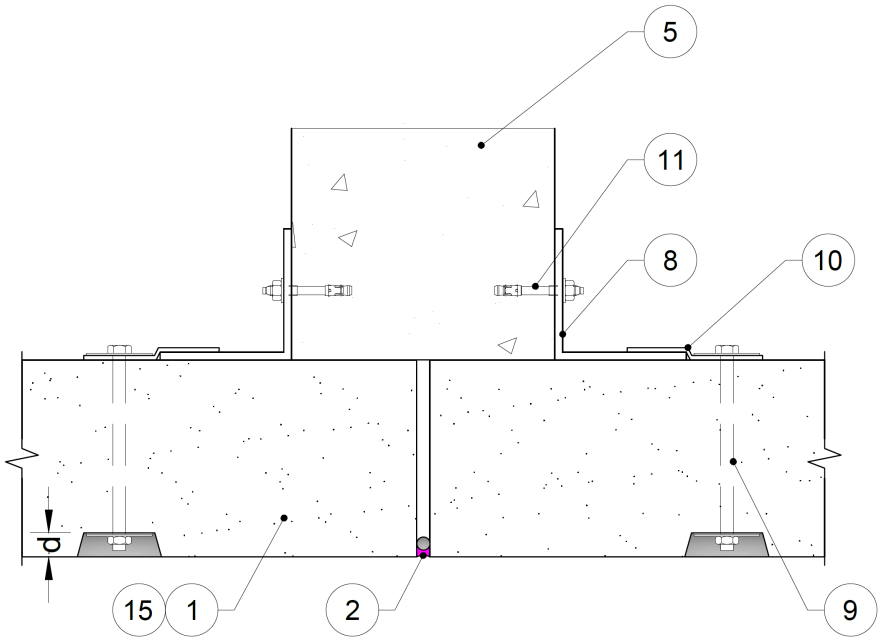

Figure 2 – Plan Section at Vertical Concrete Column – Z Clips and Recessed Bolts

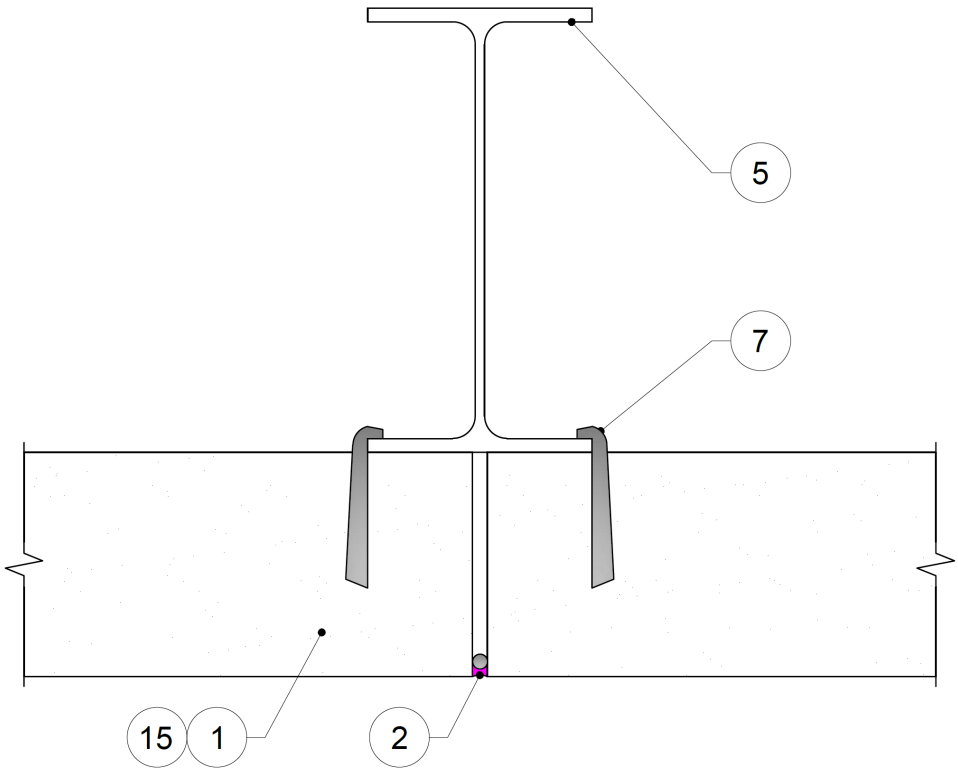

Figure 3 – Plan Section at Vertical Steel Column – Hebel Ties

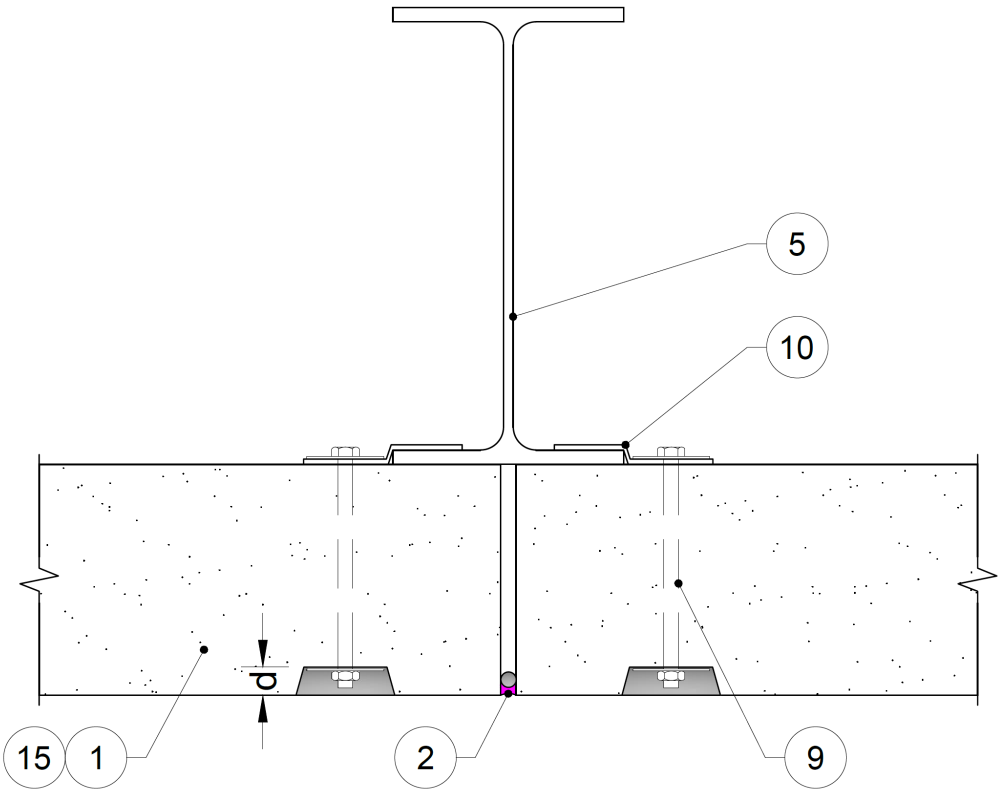

Figure 4 – Plan Section at Vertical Steel Column – Z Clips and Recessed Bolts

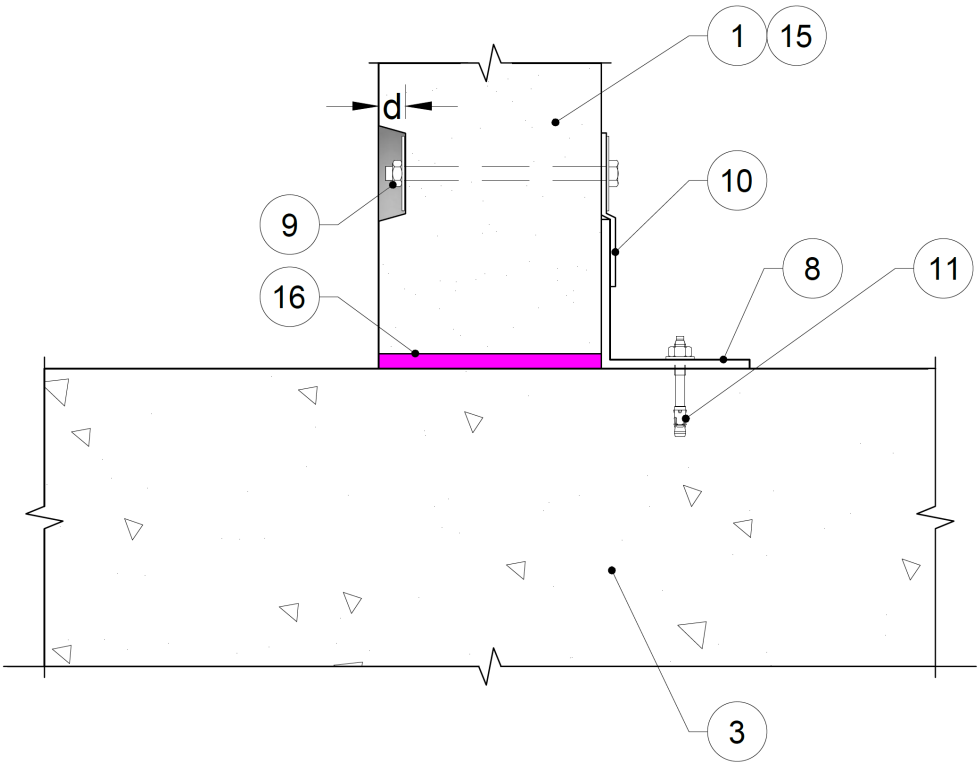

Figure 5 – Elevation Section at Base of wall

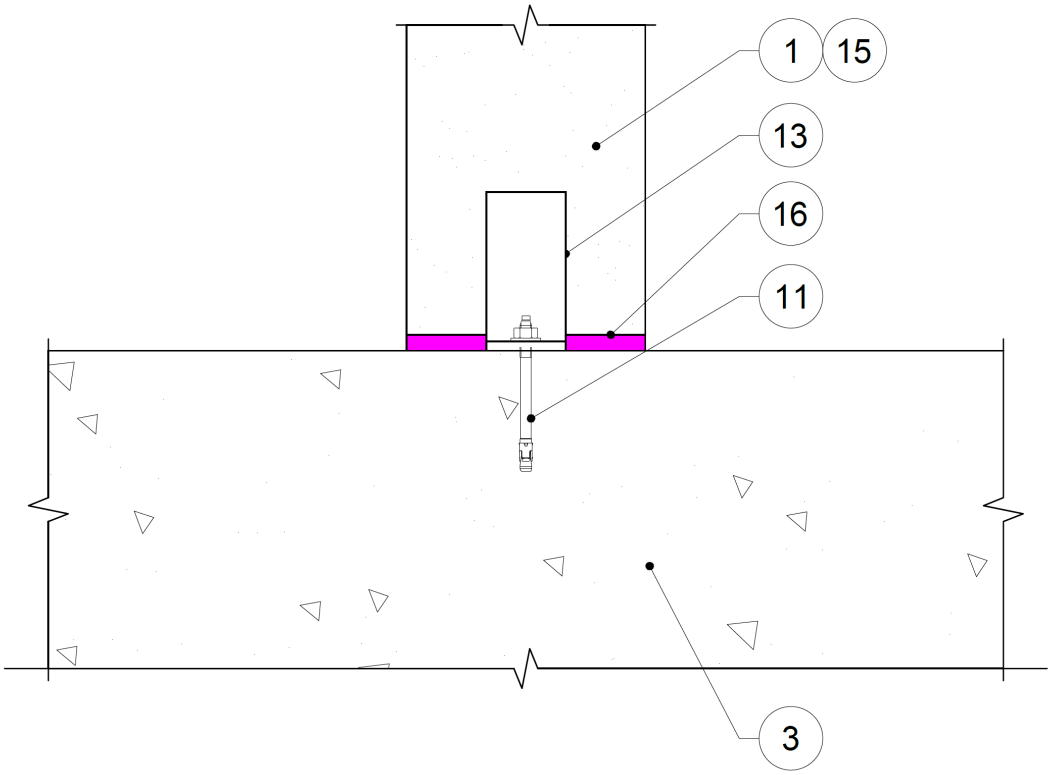

Figure 6 – Elevation Section at Base of wall

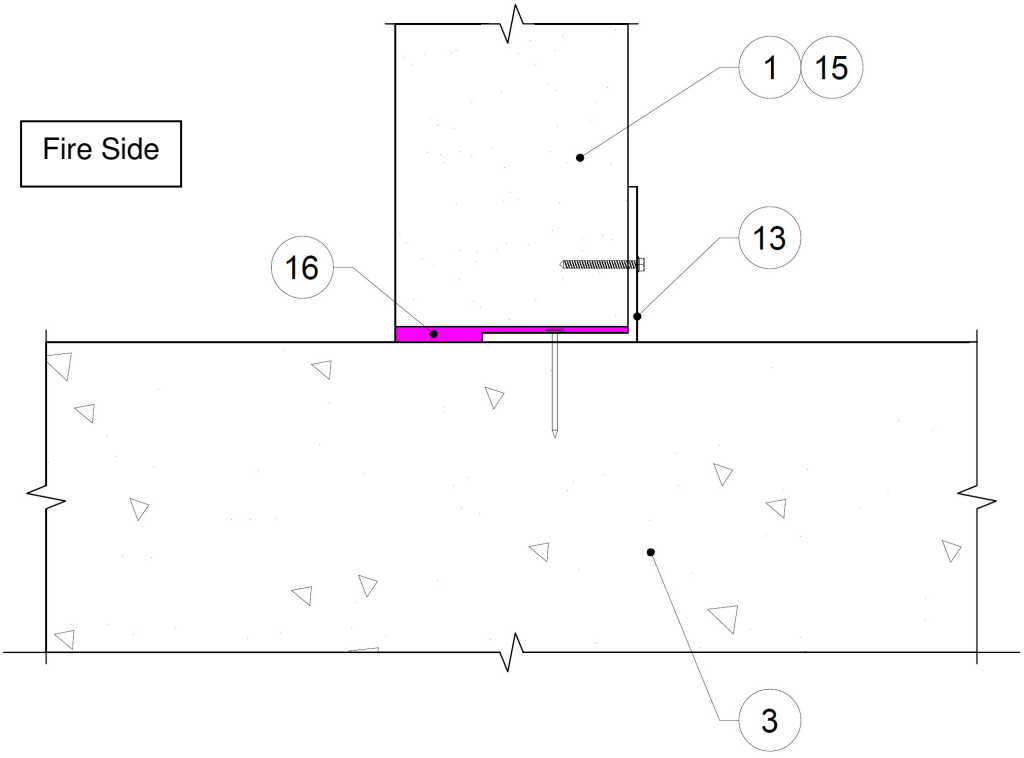

Figure 7 – Elevation Section at Base of wall

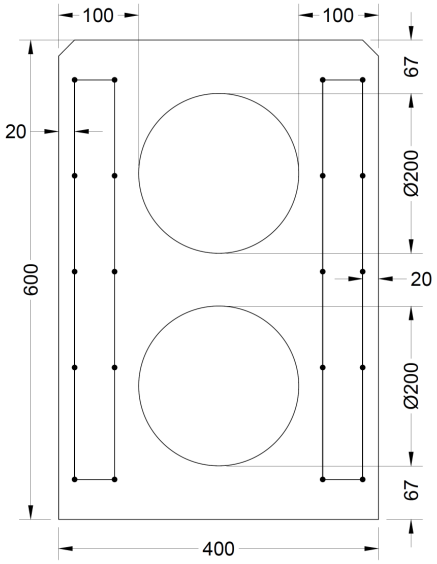

Figure 8 – Hebel® Service Panel Type 1

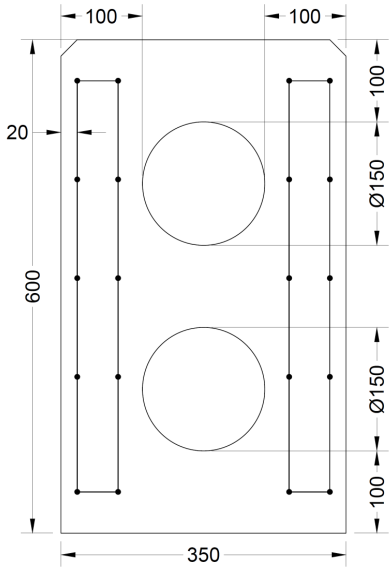

Figure 9 – Hebel® Service Panel Type 2

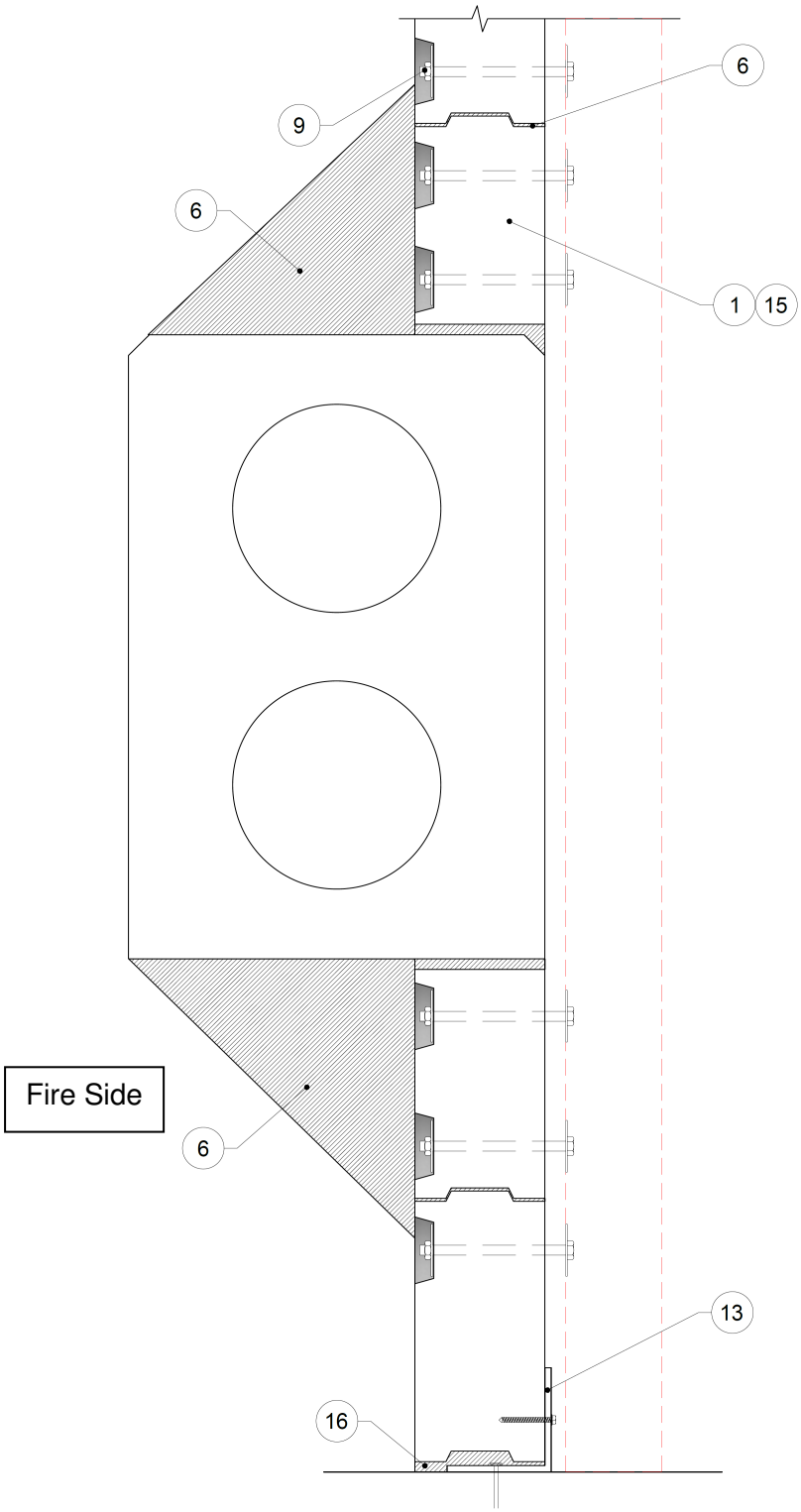

Figure 10 – Service Panel Installation Option 1 (Tongue and Groove edge profile shown can optionally be nil profile for 150mm panels)

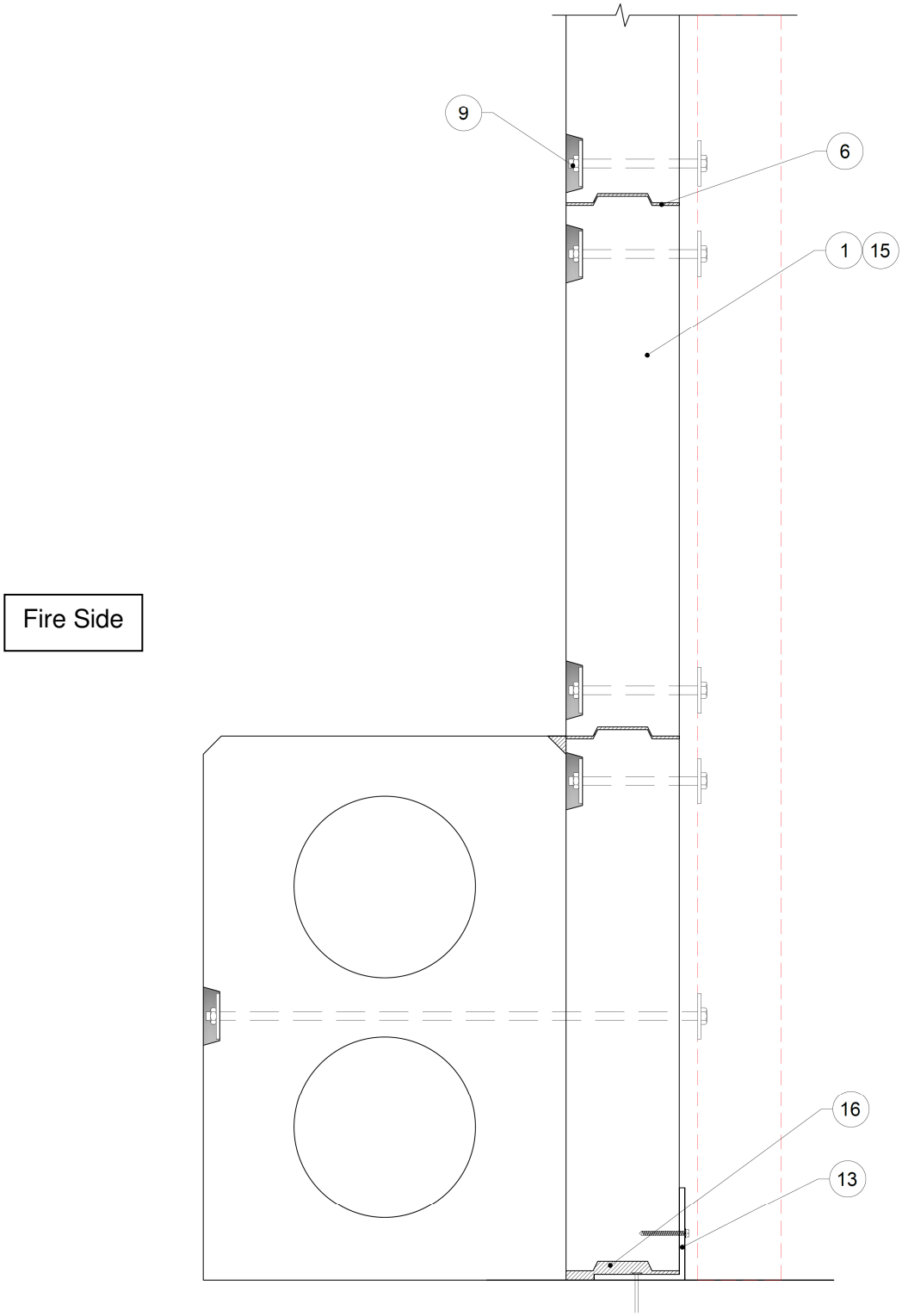

Figure 11 – Service Panel Installation Option 2 (Tongue and Groove edge profile shown can optionally be nil profile for 150mm panels)

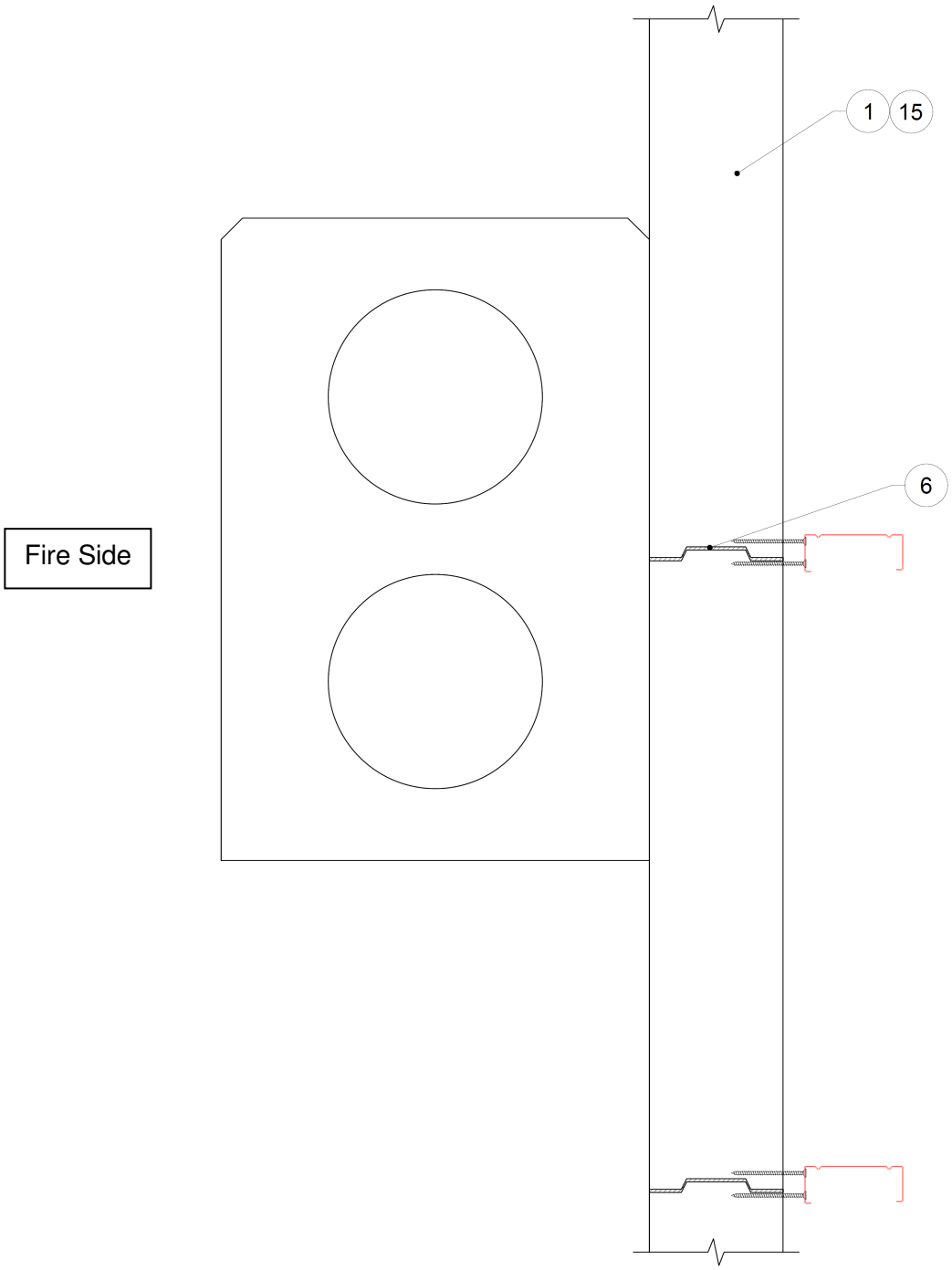

Figure 12 – Service Panel Installation Option 3 (Plan View) (Tongue and Groove edge profile shown can optionally be nil profile for 150mm panels)

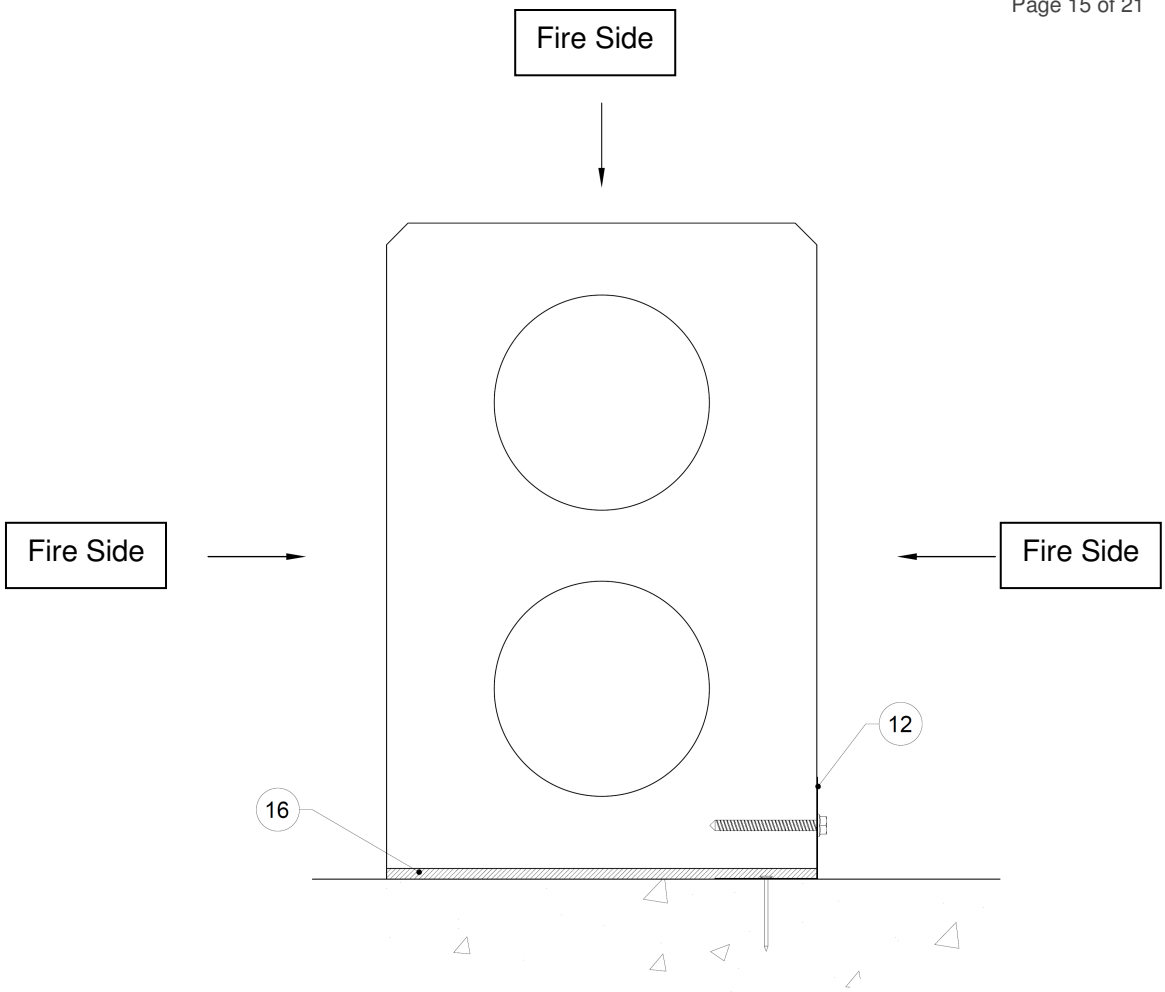

Figure 13 – Service Panel Installation Option 4

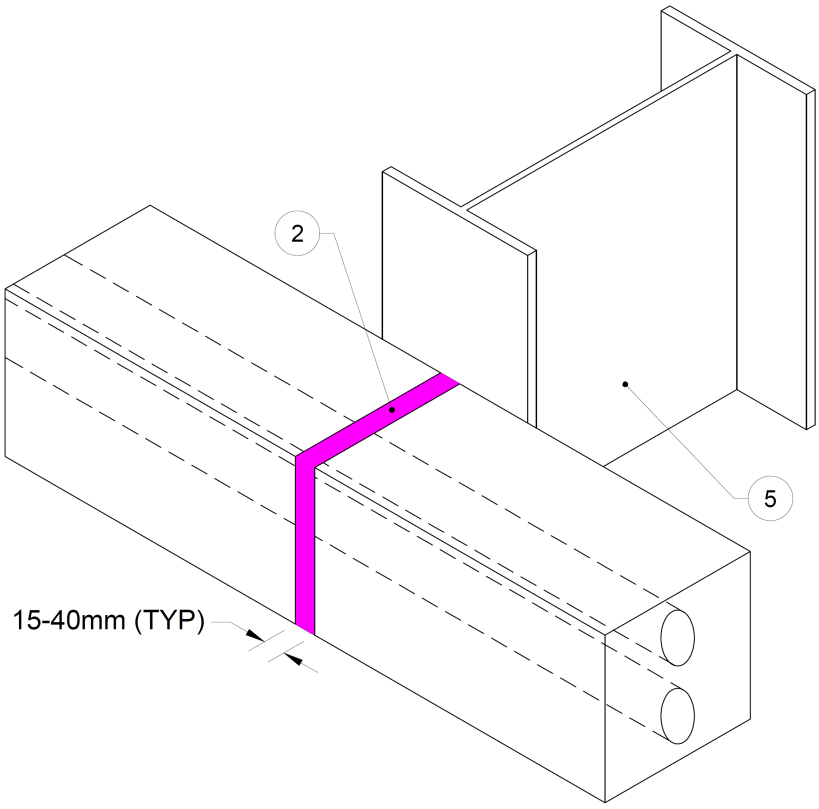

Figure 14 – Service Panel Joint Detail

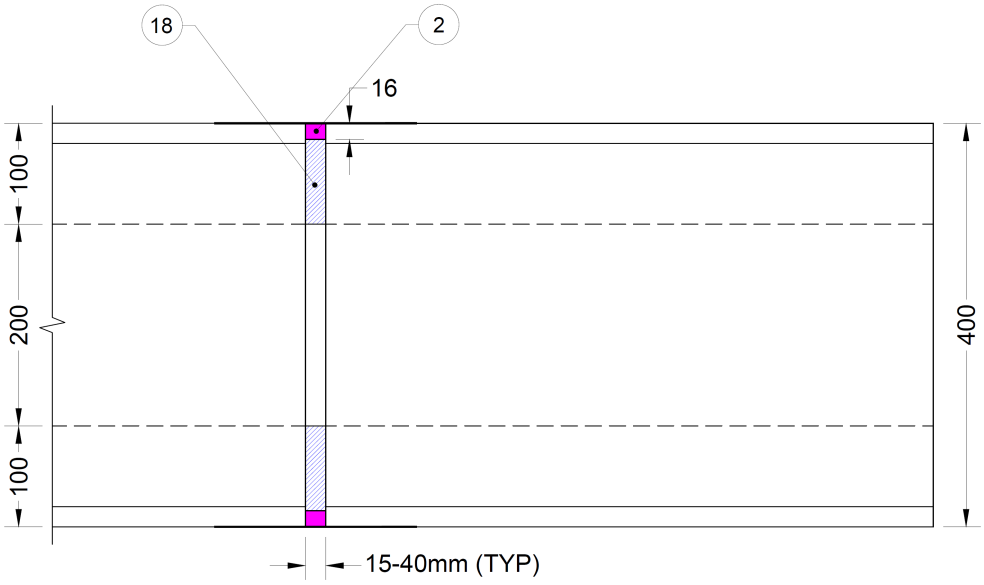

Figure 15 – Service Panel Type 1 Joint Detail –Plan View

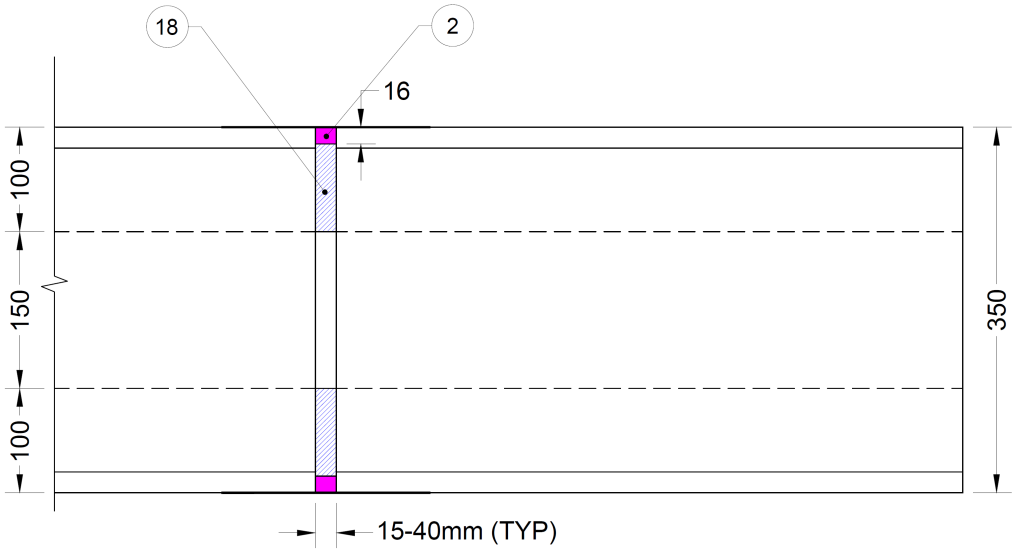

Figure 16 – Service Panel Type 2 Joint Detail –Plan View

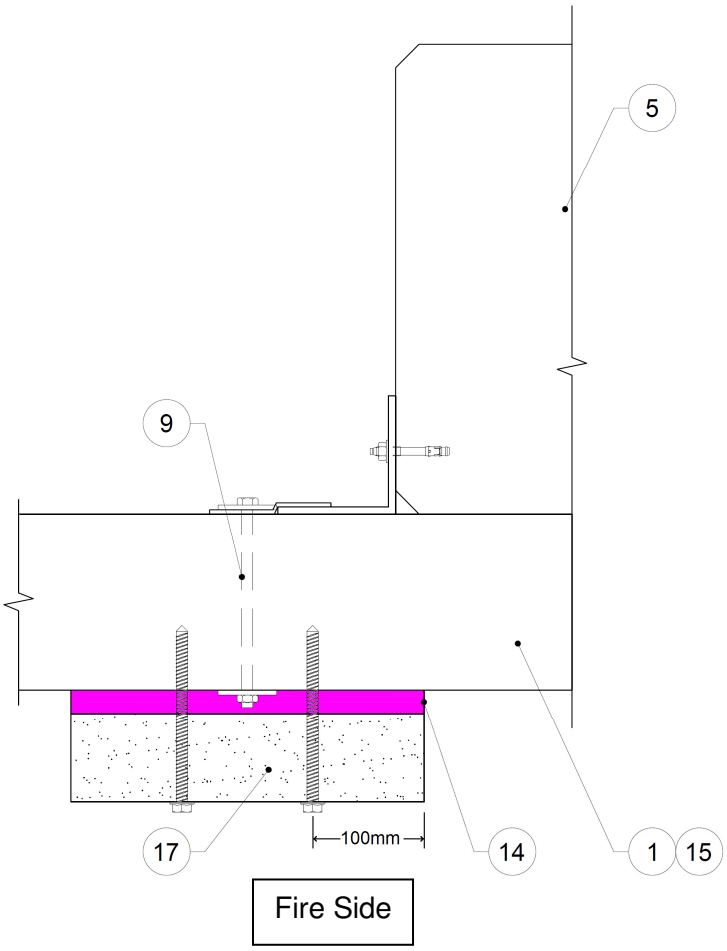

Figure 17 – Hebel Powerpanel or Powerpanel XL Bolt Shielding

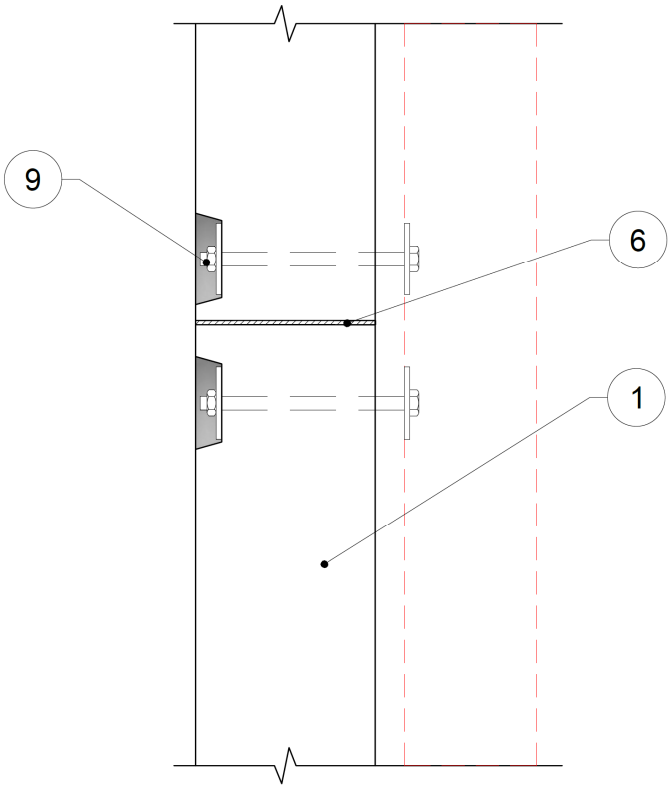

Figure 18 – Example of nil profile edge of 150mm thick panel

4 REFERENCED TEST PROCEDURES

The referenced assessment report is prepared with reference to the requirements of AS1530.4-2005

5 FORMAL ASSESSMENT SUMMARY

Based on the discussion presented in the referenced assessment 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 FRL as stated below if tested in accordance with the method referenced in Section 4 and subject to the requirements of Section 7.

Table 2 – Summary of Assessed Performance for Hebel® Panel Walls with or without Hebel® Service Panel Type 1 and 2

Minimum Panel Thickness (mm)	Maximum Wall Height (mm) Y	Maximum Wall Width (mm) X	Cover to Recessed Bolts (mm) d	FRL
150	6000	6000	0	-/60/60
			0	-/90/90
			0	-/120/120
			60	-/180/180
			75	-/240/240
			Panel Cover (refer to figure 17)	-/240/240
125	6000	6000	0	-/60/60
			0	-/90/90
			0	-/120/120
			60	-/180/180
			75	-/240/240
			Panel Cover (refer to figure 17)	-/240/240

Table 3 – Temperature inside Hebel® Service Panels (Additional information for consideration of others)

Option	Detail	Temperature inside Penetration Conduit when exposed to Cellulosic Exposure					
		Type 1			Type 2		
		120 mins	180 mins	240 mins	120 mins	180 mins	240 mins
1	8-10, 14-16	171℃	231℃	274℃	171℃	232℃	275℃
2	8-9, 11, 14-16	341℃	429℃	488℃	234℃	333℃	400℃
3	8-9, 12, 14-16	342℃	432℃	497℃	234℃	333℃	401℃
4	8-9, 13, 14-16	355℃	467℃	556℃	244℃	366℃	462℃

6 DIRECT FIELD OF APPLICATION

The application of the results of the referenced assessment report is to wall systems when exposed to the effects of fire from one side only.

7 REQUIREMENTS

The referenced assessment 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 AS1530.4-2005.

The entry and exit of the conduits in the walls are excluded in the scope of the assessment, any such penetrations shall be verified by testing to not exceed the enclosure temperatures stated in the report.

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

8 VALIDITY

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

The conclusions of the referenced assessment 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 assessment 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. This 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 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 assessment report shall not be used for the assessment of variations other than those stated in the conclusions above. The referenced assessment report 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

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 affect 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: Reviewed by:

S. Hu D. Nicholson

9.4 DATE OF ISSUE

20/07/2016

9.5 EXPIRY DATE

17/02/2020