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Regulatory information report

CSR Hebel partywalls incorporating aluminium clips to AS 1530.4:2014

Sponsor: CSR Hebel

Report number: FAS190160 Revision: RIR21.0 Reference number: 45771

Issued date: 27 February 2023 Expiry date: 28 February 2028

Quality management

Issue date	Issue no	Description	Prepared by	Reviewed by
19/01/2005	45771.1	Initial Issue	K. Nicholls	P. England
08/02/2005	45771.2	Minor Revision	K. Nicholls	P. England
12/10/2005	45771.3	Removal of plasterboard fixed to panel, reference to test report WFRA 41154.2 and assessed against AS1530.4:2005	K. Nicholls	A. Rayner
01/12/2011	45771.4	Revised to include 3.3 m panels	K. Nicholls	S. Kettle
12/03/2012	45771.5	Revised to include reduced spacing of clips	K. Nicholls	S. Kettle
14/05/2012	45771.6	Typographical amendment	K. Nicholls	M. Kamal
31/01/2013	45771.7	Revised to include panels of reduced density	K. Nicholls	S. Townsend
15/02/2013	45771.8	Typographical amendment	K. Nicholls	S. Hui
23/02/2013	45771.9	Typographical amendment	K. Nicholls	S. Hui
30/07/2013	45771.10	Revised to include 400kg/m^3 75 mm thick PowerPanel XL for System A and B	K. Nicholls	S. Hui
11/02/2014	45771.11	Revised to include CSR Fireseal strips in horizontal joints between Hebel panels.	K. Nicholls	S. Hui
27/02/2014	45771.12	Revised to include CSR Fireseal sealant in horizontal and vertical joints between Hebel panels.	K. Nicholls	S. Hui
7/07/2016	45771.13	Revised to include additional plasterboard type	K. Nicholls	S. Hui
16/11/2016	45771.14	Revised to include additional variations for control joint	O. Saad	C. McLean
17/05/2017	45771.15	Revised to update control joint drawing	O. Saad	C. McLean
07/02/2018	45771.16	Revised to include party wall overhang over common ground floor veranda	H. Wong	O. Saad
14/08/2018	45771.17	Revised to discuss increase of aluminium clip thickness	O.Saad	C. McLean
01/05/2019	45771.18	Revised to include eave details	T. Bhat	R. Al Darwish
09/05/2019	45771.18.1	Revised to include a statement regarding bracket fixings	T. Bhat	R. Al Darwish

Version	Date	Information about the report			
RIR 45771.19.1	Issue: 06 Dec 2019	Reason for issue	• Revised to the updated Warringtonfire report template under a new reference number (FAS190160) • Revised to include additional base, junction and roof details for partywall systems with 50mm and 75mm Hebel panels. • Revised to include an additional 70 mm wide aluminium clip		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Omar Saad	Omar Saad
RIR 45771.20.0	Issue: 24 Nov 2020	Reason for issue	• Overhangs in vertical Hebel panels • Figure 24 – cantilever length description revised • Inclusion of horizontally oriented tapering Hebel panels within the roof space.		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Omar Saad	Omar Saad
45771 RIR20.2	Issue:	Reason for issue	Revised to extend wall heights for 75 mm PowerPanel and PowerPanel XL intertanancy systems.		

Version	Date	Information about the report			
	25 Nov 2021		Inclusion of additional cantilevered intertenancy systems supported with steel angles – Figure 27 and Figure 28.		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Dugald Watson	Yomal Dias	Yomal Dias
45771 RIR20.4	Issue: 11 Nov 2022	Reason for issue	Various updates across the report		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Yomal Dias	Omar Saad	Omar Saad
45771 RIR21.0	Issue: 27 Feb 2023	Reason for issue	Report revalidated and period of validity extended by another five years.		
			Prepared by	**Reviewed by**	**Authorised by**
	Expiry: 28 Feb 2028	**Name**	Yomal Dias	Omar Saad	Mahmoud Akl
		Signature			

*RIR20.1 and RIR20.3 have been skipped to maintain document numbering consistent with referenced assessment report.

Executive summary

This report contains the minimum information required for regulatory compliance and refers to the referenced assessment report FAS190160 R21.0.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the fire resistance level (FRL) of 75 mm Hebel PowerPanel and PowerPanel^{XL} and 50 mm PowerPanel party walls in accordance with AS 1530.4:2014.

The analysis in sections 5 and 6 of the referenced assessment report found that the proposed systems, together with the described variations, are expected to achieve the outcomes shown in Table 1 and Table 2 – in accordance with AS 1530.4:2014.

The variations and outcome of this assessment are subject to the limitations and requirements described in sections 2, 3 and 6 of this report. The results of this report are valid until 28 February 2028.

Table 1 Hebel Partywalls with 75 mm thick PowerPanel or PowerPanel^{XL}

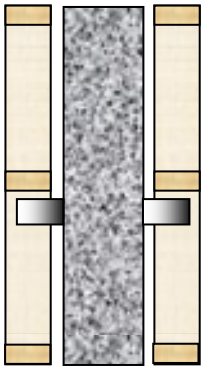
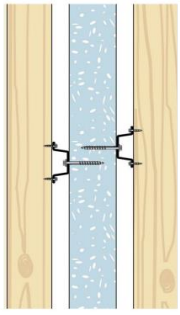
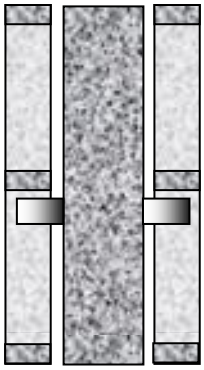
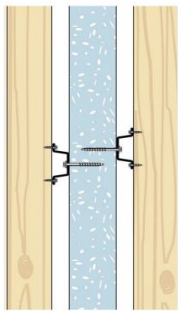
Description	Central core	Framing	Lining	Fixings	Outcome
	• 75 mm CSR Hebel PowerPanel (510 kg/m^3) • 75 mm CSR Hebel PowerPanel^{XL} (400 kg/m^3)	Loadbearing or non-loadbearing timber or steel framing	No lining required	Aluminum clips	12 m high (max) FRL 90/90/90 or FRL -/90/90 16.5 m high (max) FRL 60/60/60 or FRL -/60/60
		Loadbearing or non-loadbearing timber framing only		Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	
*Used in cantilevered wall systems only. Overall wall height would be lower than that prescribed in the outcome due to the absence of lower-level floors.					

Table 2 Hebel Partywalls with 50 mm thick PowerPanel

Description	Central core	Framing	Lining	Fixings	Outcome
	50 mm CSR Hebel PowerPanel (510 kg/m^3)	Loadbearing or non-loadbearing timber or steel framing	• As per section 4.3.4 • Wall lining may be omitted within the ceiling space only for ceiling heights up to 1.5 m	Aluminum clips	7.2 m high (max) FRL 90/90/90 or FRL -/90/90
		Loadbearing or non-loadbearing timber or steel framing	No lining required	Aluminum clips	7.2 m high (max) FRL 60/60/60 or FRL -/60/60
		Loadbearing or non-loadbearing timber framing only	• As per section 4.3.4 • Wall lining may be omitted within the ceiling space only for ceiling heights up to 1.5 m	Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	7.2 m high (max) FRL 90/90/90 or FRL -/90/90
		Loadbearing or non-loadbearing timber framing only	No lining required	Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	7.2 m high (max) FRL 60/60/60 or FRL -/60/60

*Used in cantilevered wall systems only. Overall wall height would be lower than that prescribed in the outcome due to the absence of a ground floor wall.

Contents

1. Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the assessment report FAS190160 R1.0.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the fire resistance level (FRL) of 75 mm Hebel PowerPanel and PowerPanel^{XL}, and 50 mm PowerPanel party walls in accordance with AS 1530.4:2014[1].

The referenced assessment report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction, or design as given within the scope of the referenced assessment report. It also references test evidence for meeting deemed to satisfy (DTS) provisions of the NCC that apply to the assessed systems. The documentation that forms the basis for the referenced assessment report is listed in Appendix A of the referenced report.

The referenced assessment was carried out at the request of CSR Hebel.

The sponsor details are included in Table 3.

Table 3 Sponsor details

Sponsor	Address
CSR Building Products	Triniti 3, 39 Delhi Road, North Ryde NSW

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion about the expected performance of a component or element of structure subjected to a fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for undertaking these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2021[2].

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

Assessments can vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

This assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance of the elements in accordance with AS 1530.4:2014.

[1] Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.

[2] Passive Fire Protection Forum (PFPF), 2021, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

This assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

2.2 Compliance with the National Construction Code

This assessment report has been prepared to meet the evidence of suitability requirements of the NCC 2022[3] under A5G3 (1) (d). It references test evidence for meeting deemed to satisfy (DTS) provisions of the NCC under A5G5 for fire resistance level that apply to the assessed systems based on Specifications 1 and 2 for fire resistance for building elements.

This assessment report may also be used to demonstrate compliance with the requirements for evidence of suitability under the relevant sections of previous versions of the NCC.

2.3 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal on 17 January 2023, CSR Hebel confirmed that:

- To their knowledge, the variations to the component or element of structure, which is the subject of this assessment, have 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.

3. Limitations and requirements of this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 4.3.
- The referenced assessment report details the methods of construction, test conditions and assessed results expected in accordance with AS 1530.4:2014.
- This assessment applies to wall systems exposed to fire from each side in accordance with the requirements of AS 1530.4:2014, where vertical elements must be exposed to heat from the direction required to resist fire exposure.
- Input from other personnel, such as structural engineers conducting structural designs for the relevant baseline systems are required for wall framing, cantilevered floor joist overhang, top bottom plates / noggings providing lateral support to the Hebel core and other relevant details where specified.
- The referenced assessment report is only valid for the assessed system/s and must not be used for any other purpose. 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 need to be done by an Accredited Testing Laboratory (ATL) that is accredited to the same nominated standards of 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.

[3] National Construction Code Volumes One and Two - Building Code of Australia 2022, Australian Building Codes Board, Australia

- The non-combustibility requirements and fire resistance performance of external wall and roof systems do not form part of this assessment report. The suitability of the assessed systems for applications that are required to conform to non-combustible construction specifications and / or fire resistance performance as required by the NCC for external wall and roof systems must be confirmed by the appropriate Authorities Having Jurisdiction (AHJ).
- This assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.
- This assessment is based on the performance of the original prototype test specimens and the testing conditions and methodology described in the referenced assessment report. This assessment is valid for subsequent constructions built with products with properties, strength characteristics and quality identical those of the referenced test specimens.

4. Description of the specimen and variations

4.1 Description of assessed systems

The CSR Hebel party wall systems consist of a central core of CSR Hebel PowerPanel or PowerPanelXL with an aluminium connection system to the structural frames on each side of the panel, to which linings are fitted. CSR Hebel PowerPanels are 75 mm or 50 mm thick steel reinforced panels manufactured from CSR Hebel AAC (autoclaved aerated concrete).

The central core consists of 75 mm PowerPanel, 75 mm PowerPanelXL or 50 mm PowerPanel Panels with a maximum length of 3.3 m and maximum width of 600 mm. There are two edge details for CSR Hebel PowerPanel with square edges or a tongue and groove profile. Vertical joints between the panels are always formed using Hebel adhesive. Any gaps, cracks or incidental defects up to 3 mm in size are filled with Hebel adhesive. The typical arrangement of an intertenancy wall system is shown in Figure 1.

AS 1530.4:2014 is a standard that outlines the fire performance of building materials, components, and structures. However, it does not specifically address the testing of wall systems where loads are applied independently to frames either side of a central core. In light of this, section 4.4 of the referenced assessment report provides an interpretation of AS 1530.4:2014 and the relevant fire safety requirements of the NCC, on which the referenced assessment is based. This interpretation aims to fill the gap left by the standard and ensures that the assessed wall systems meet the required fire resistance levels.

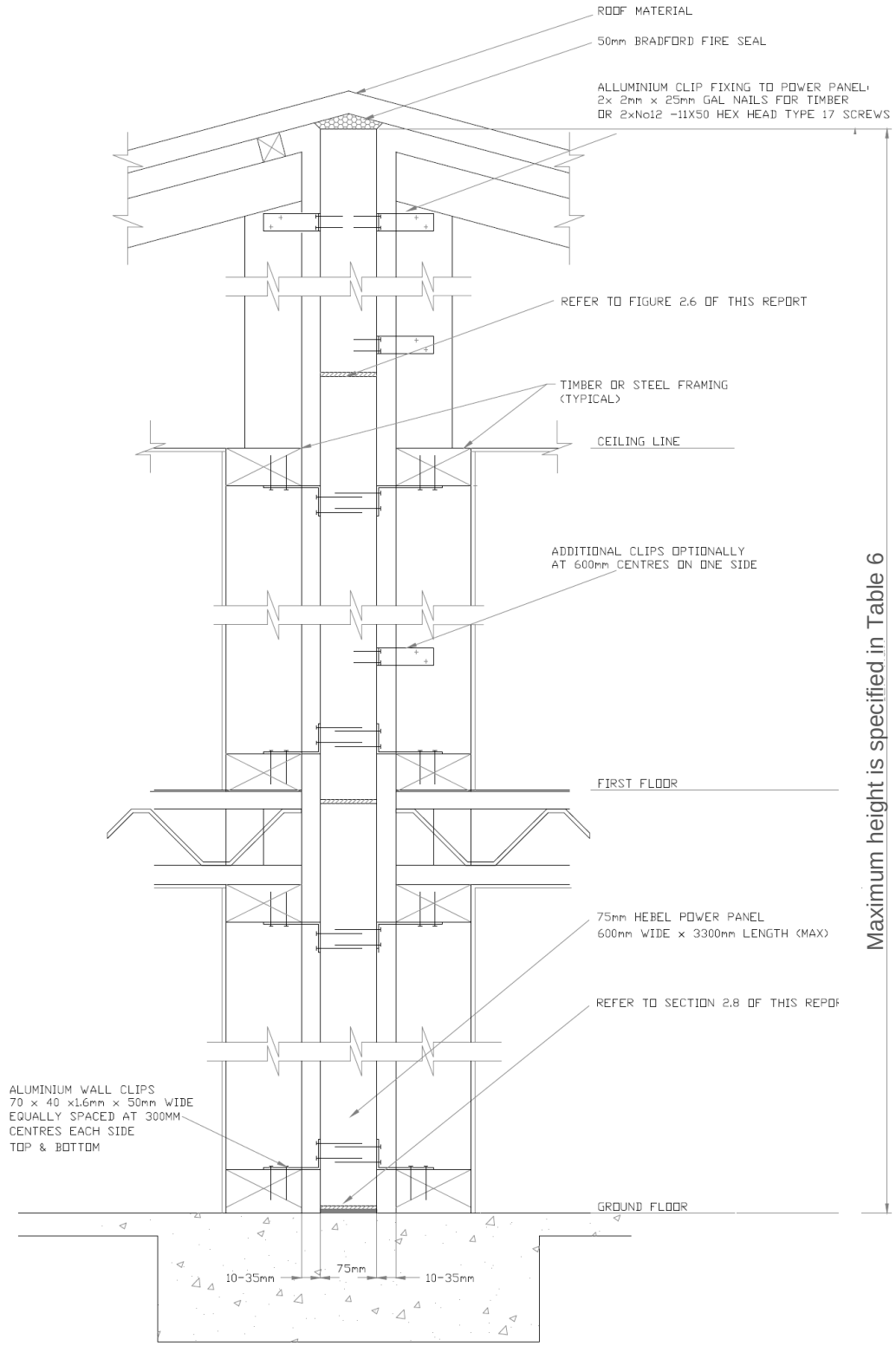


Figure 1Typical elevation of 75 mm PowerPanel CSR partywall systems with aluminium clips

4.2 Referenced test data

The assessment of the variation to the tested systems and the determination of the expected performance are based on the results of the fire tests documented in the reports summarised in Table 4. Further details of the tested systems are included in Appendix A of the referenced report.

Table 4 Referenced test data

Report number	Test sponsor	Test date	Testing authority
SI 1584	CSR Limited	2/06/1972	Experimental Building Station – Department of Housing and Construction
FSV 0356	CSR Hebel	22/02/1995	CSIRO
FSV 0668	CSR Hebel	May-99	CSIRO
WFRA 41082	CSR Gyprock	16/04/2004	Warringtonfire
WFRA 41154.2	CSR Building Products	7/04/2005	Warringtonfire
BWA 2212500.1	CSR Bradford	19/09/2007	Warringtonfire
EWFA 2505300.2	Selleys	9/09/2010	Warringtonfire
EWFA 2778500b.1	CSR Building Products	24/10/2012	Warringtonfire
EWFA 2802001.2	CSR Building Products	27/03/2013	Warringtonfire
FSP 1841	CSR Building Products	22/12/2016	CSIRO
FSV 1828	CSR Building Products	17/03/2017	CSIRO
FRT 210471 R1.0	CSR Hebel	23/02/2022	Warringtonfire

4.3 Variations to the tested systems

4.3.1 Aluminium clip connecting PowerPanel core to structural frames

The panels are secured to the structural frame on both sides of the central core using the following methods:

- The Hebel PowerPanels are secured to the structural frame on both sides of the central core by 70 mm × 40 mm × 1.6 mm thick aluminium clips that are 50 mm wide. The aluminium clips are on each side of each panel, top and bottom, and spaced at maximum 3000 mm centres vertically. Clips must be not more than 600 mm apart horizontally and located within the central 300 mm portion of the 600 mm wide Hebel panel. Ie the distance from the aluminium clip to the vertical joints must be not less than 150 mm.
- The aluminium clips are screw fixed to the Hebel PowerPanel with two No 12-8 × 60 mm long or two No 12 11 × 50 mm long Hex Head Type 17 screws. The aluminium clips are fixed to the timber framing with two minimum 25 mm long hot dipped galvanised steel nails or 2 × No 12-11 × 25 mm long Hex head screws. The aluminium clips must be fixed to steel framing with two 10-16 × 16 mm long wafer head screws.
- For Hebel 75 mm and 50 mm PowerPanel intertenancy walls, the aluminium brackets used on either side of the panel do not require to be aligned with each other. In cases where the floor joist on one unit is higher than the other unit, the panels are acceptable to be fixed where the brackets on each side of the panel are not aligned. The brackets can be fixed to the top and bottom plates of stud frames on each side. The criteria below must be met in the installation of the panels:
  - the bracket to panel joint on each side does not exceed 600 mm. and;
  - the brackets are fixed to studs or nogging on each side of the panel and;
  - the maximum bracket fixing spacing for ground floor panels does not exceed 3000 mm and 2900 mm for 75 mm and 50 mm panels, respectively.

- It is proposed that 70 mm wide, 70 mm × 40 mm × 2.0 mm thick aluminium clips can be used in the proposed systems instead of the 50 mm wide, 70 mm × 40 mm × 1.6 mm ones. The rest of the details remain unchanged.

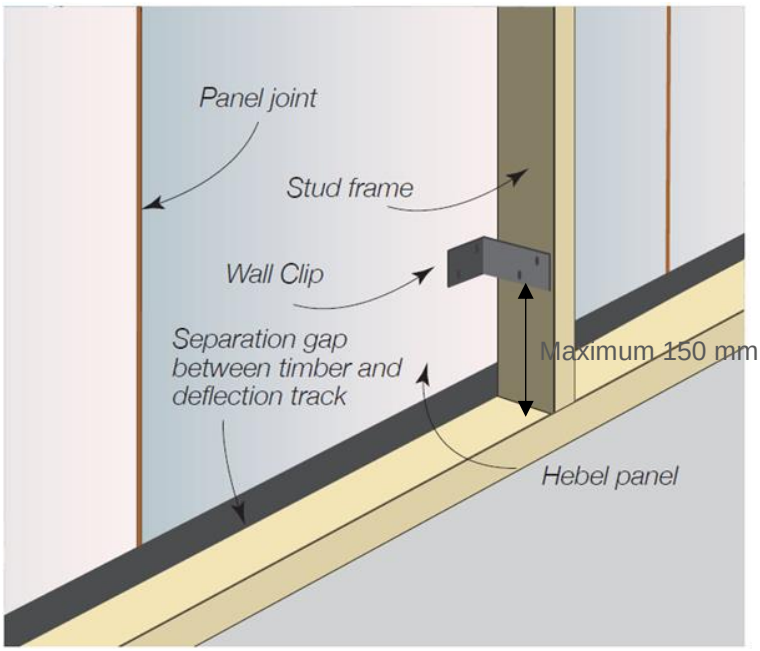


Figure 2 Aluminium clip offset detailing

4.3.2 Structural timber framing

The structural timber framing is to be designed in accordance with AS 1684 and AS 1720.1 by a professional structural engineer. The minimum timber stud size is to be 70 × 35 mm with a 10 mm to 35 mm separation from the Hebel PowerPanel panels. A nogging is to be provided at the clip positions to facilitate fixing to the frame if a plate is not present at the required position. To aid in the construction of the wall system, a steel batten may be fixed to one or both frames to space the panels from the frame correctly. In no case are the battens to be fixed to the panels.

4.3.3 Structural steel framing

The structural steel framing must be made from light gauge steel and must be designed in accordance with AS 3623 or AS 4600 by others. The minimum BMT for light gauge steel must be 0.5 mm with a 10 mm to 35 mm separation from the Hebel PowerPanel Panels. A nogging is to be provided at the clip positions to facilitate fixing to the frame if a plate is not present at the required position. To aid in the construction of the wall system, a steel batten may be fixed to one or both of the frames to space the panels from the frame correctly. In no case are the battens to be fixed to the panels.

Figure 3 shows an alternative detail for the fixing of aluminium clips to the steel track/floor joist via a steel top hat section. The top hat section and all the fixings must be designed by structural engineers to withstand the required design action effects under ambient conditions and also under fire conditions, considering a maximum steel temperature of 200 °C.

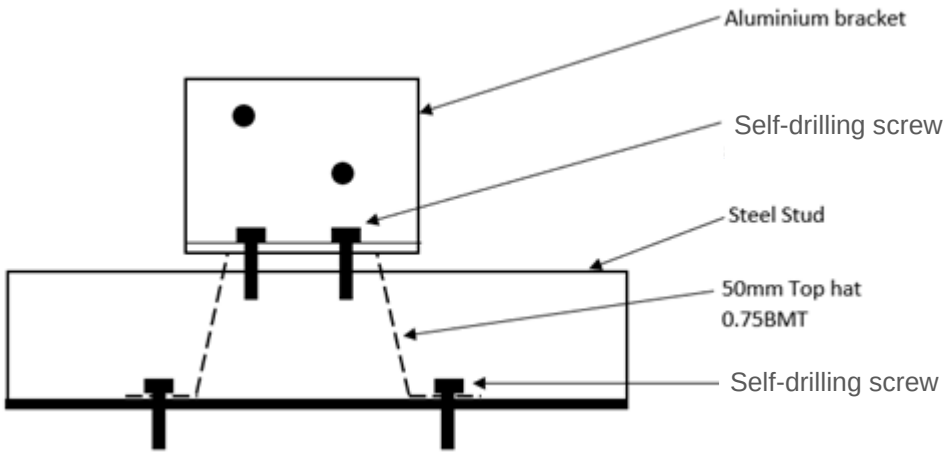


Figure 3 Alternative fixing detail for steel framed systems – aluminium clip fixed to the steel track/floor joist via steel top hat

4.3.4 Plasterboard linings

The proposed internal linings are to be installed by traditional glue and nail/screw fixing methods and must be either;

- Sound Grade Plasterboard (10 mm and 13 mm)
- Moisture Grade Plasterboard (10 mm and 13 mm)
- Standard Plasterboard or GIB board minimum 5.7 kg/m2 (10 mm and 13 mm)
- Fire Grade Plasterboard (10 mm and 13 mm)
- Fibre Cement (6 mm and 9 mm)

4.3.5 Horizontal joints in central PowerPanel core

Horizontal joints within 75 mm Hebel panels

It is proposed that horizontal joints within the field of 75 mm panels are formed as shown in Figure 4, Figure 7 or Figure 8. The sealant must be applied to both sides of the wall and achieve a fire resistance level (FRL) of -/90/90 when tested or assessed for protecting a joint in a 75 mm CSR Hebel PowerPanel.

It is proposed that horizontal joints within the field of 75 mm panels are formed as shown in Figure 5 and Figure 6. The sealant must be applied to one side of the wall and achieve a fire resistance level (FRL) of -/60/60 when tested or assessed for protecting a joint in a 75 mm CSR Hebel PowerPanel.

Bradford Fibertex 820 plain strips may be used instead of Fireseal Damper Strip for applications where the latter has been prescribed in the referenced assessment report.

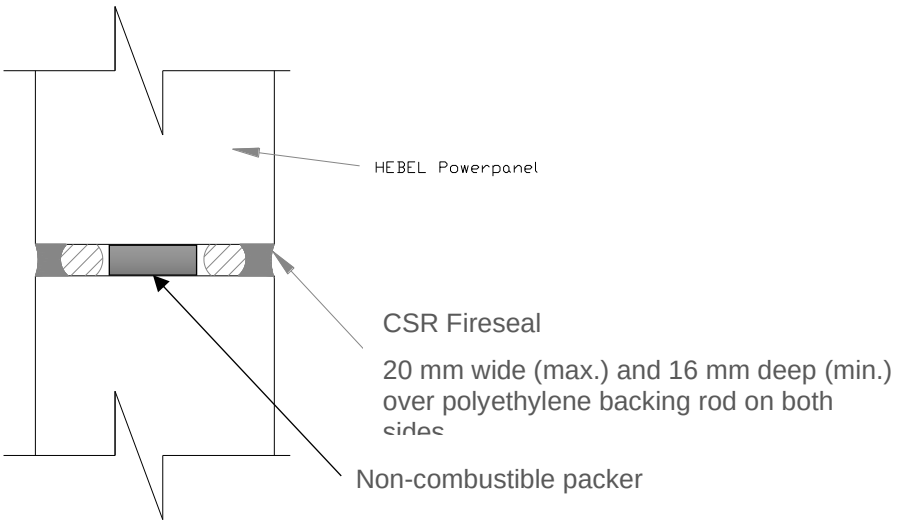


Figure 4 Horizontal joint Type 1a – 75 mm Hebel AAC panel (-/90/90 FRL)

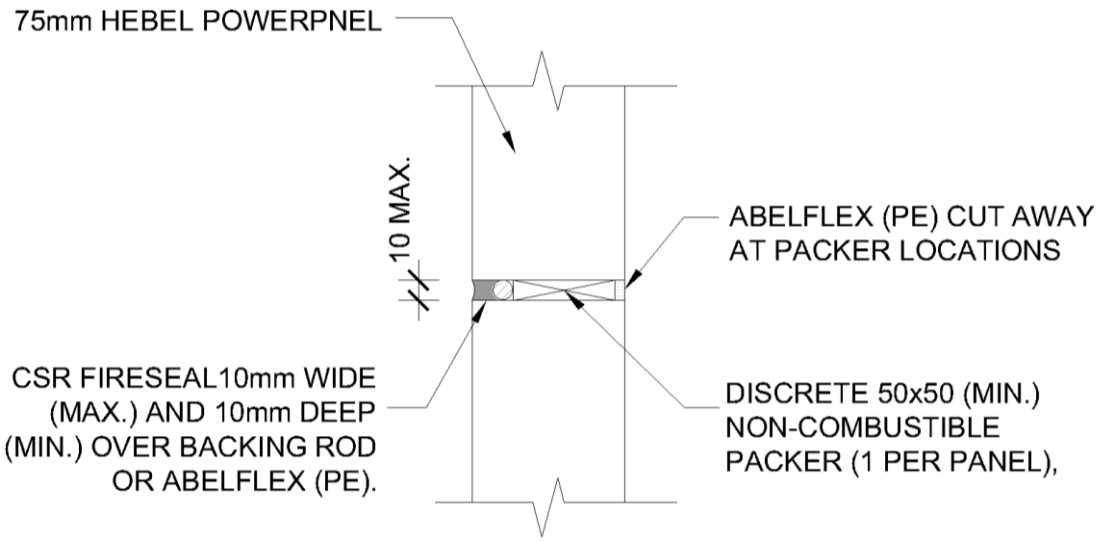


Figure 5 Horizontal joint Type 1b – 75 mm Hebel AAC panel (-/60/60 FRL)

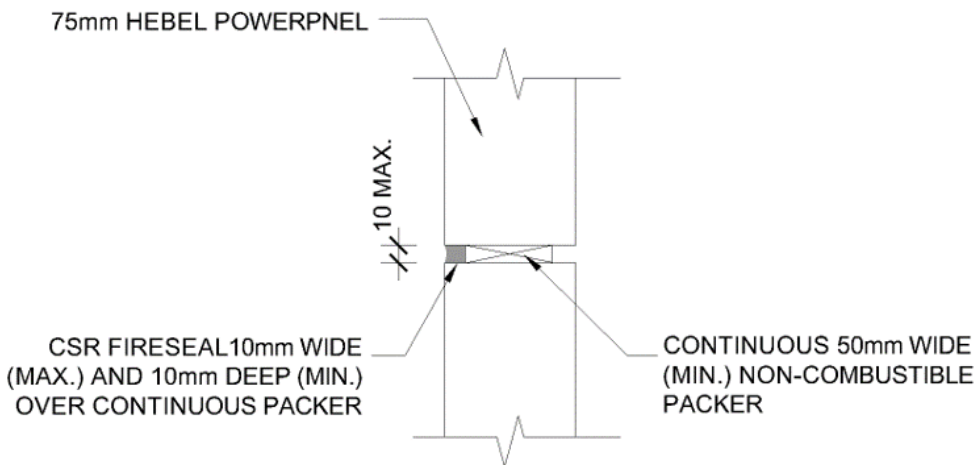


Figure 6 Horizontal joint Type 1c – 75 mm Hebel AAC panel (-/60/60 FRL)

For the track option Type 2 detail shown in Figure 7, 16 mm Fyrchek must be fixed to one side of the panel with laminating screws at 400 mm centres.

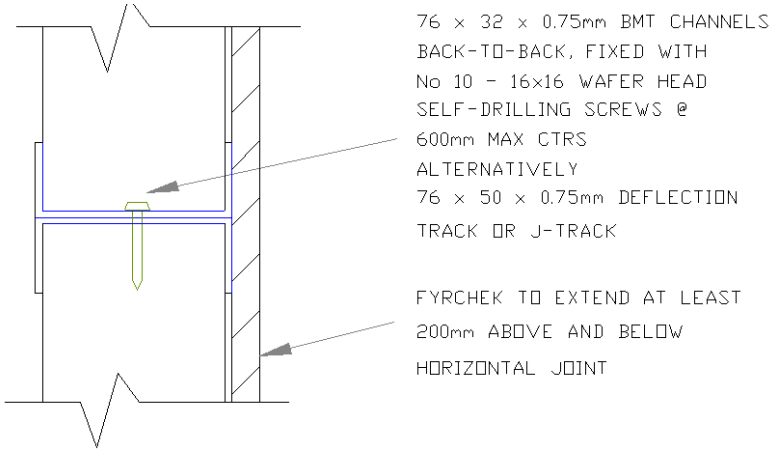


Figure 7 Horizontal joint Type 2 – 75 mm Hebel AAC panel

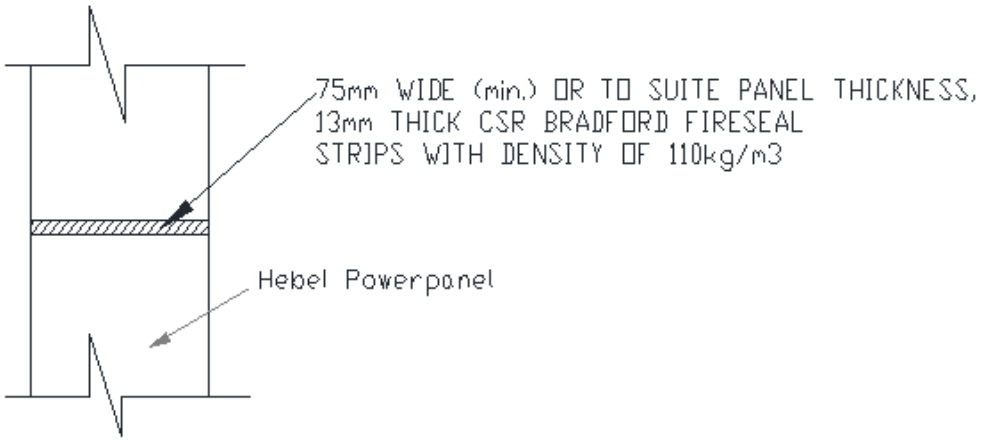


Figure 8 Horizontal joint Type 3 – 75 mm Hebel AAC panel

Horizontal joints within 50 mm Hebel panels

It is proposed that horizontal joints within the field of 50 mm panels are formed as shown in Figure 9 to Figure 12.

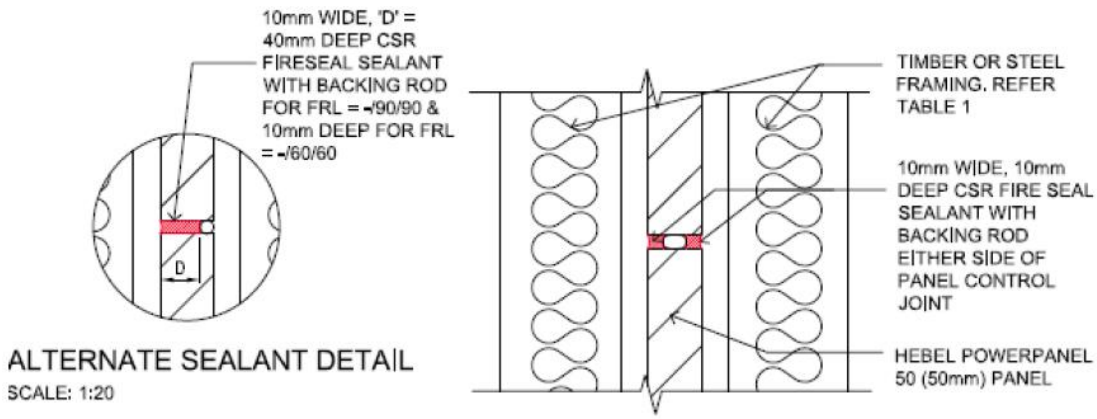


Figure 9 Horizontal joint Type 4 – 50 mm Hebel AAC panel (-/60/60 or -/90/90 FRL based on sealant configuration)

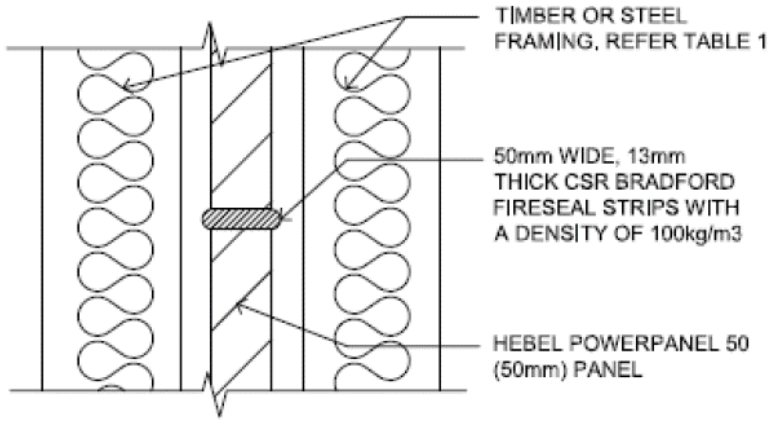


Figure 10 Horizontal joint Type 5 – 50 mm Hebel AAC panel (-/60/60 or -/90/90 FRL)

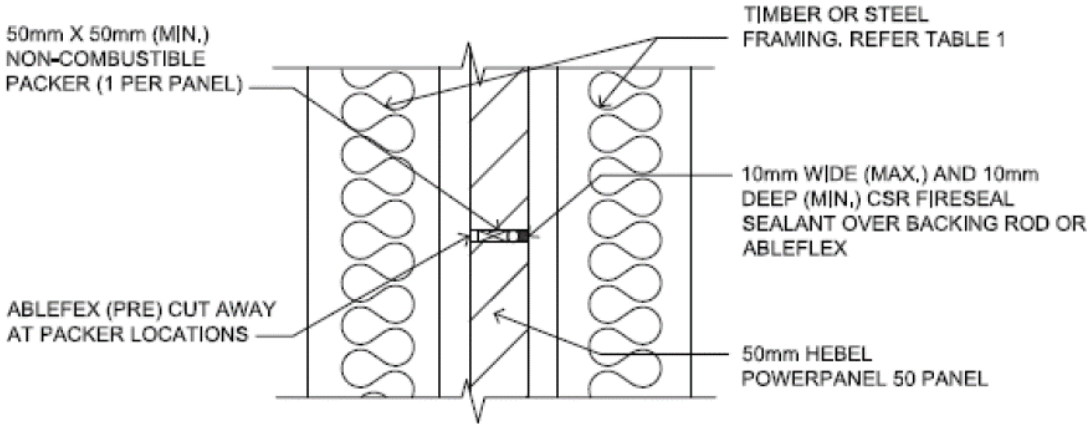


Figure 11 Horizontal joint Type 6 – 50 mm Hebel AAC panel (-/60/60 FRL)

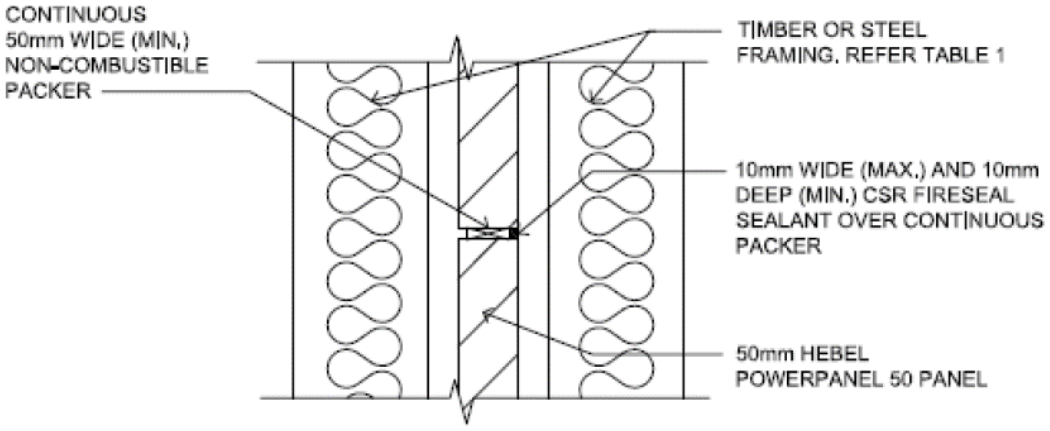


Figure 12 Horizontal Joint Type 7 – 50 mm Hebel AAC panel (-/60/60 FRL)

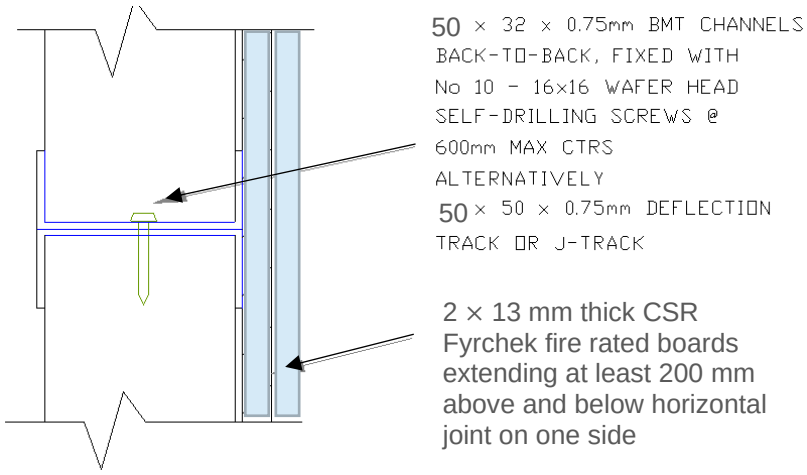


Figure 13 Horizontal joint Type 8 – 50 mm Hebel AAC panel

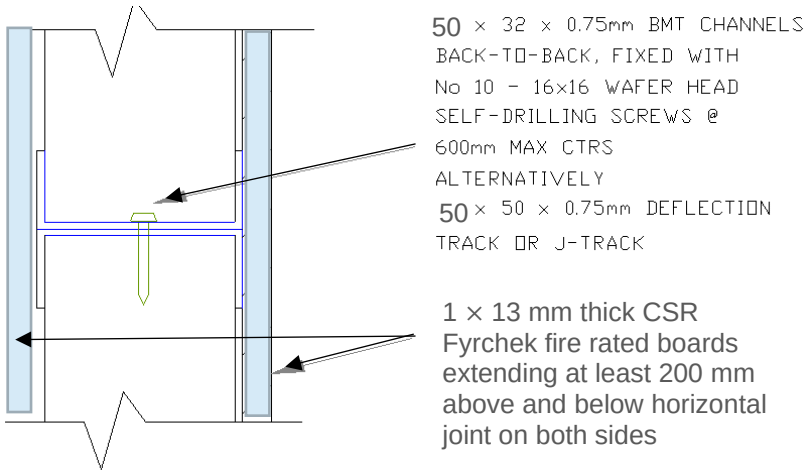


Figure 14 Horizontal joint Type 9 – 50 mm Hebel AAC panel

4.3.6 Base detail treatment for PowerPanel

Various base detail options proposed for both 75 mm and 50 mm Hebel panels are shown in Figure 15.

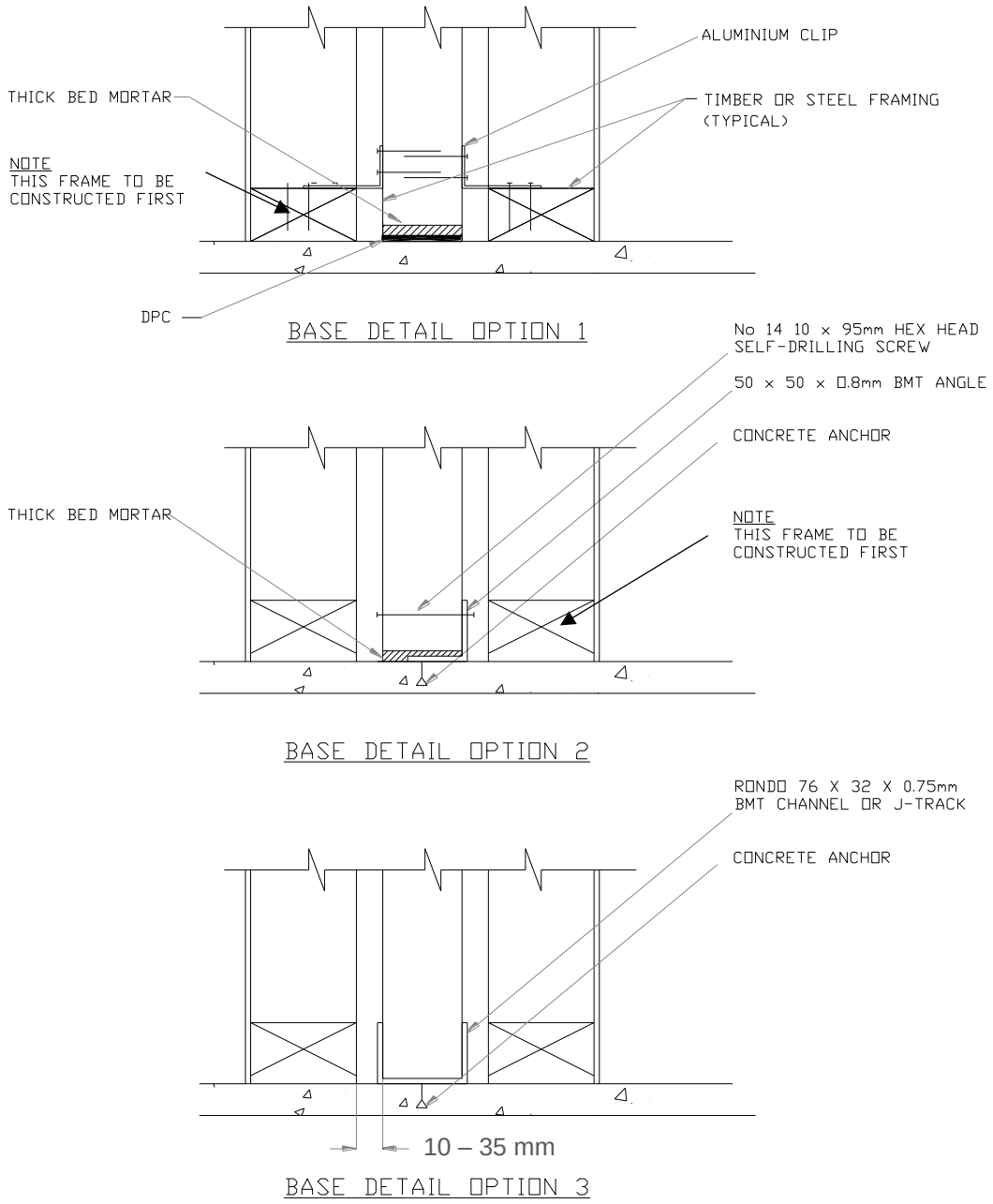


Figure 15 Base detail options

4.3.7 Treatment of service penetrations through linings in habitable areas

Services must not penetrate the PowerPanel core. However, copper pipes, power cables, and uPVC pipes up to 65 mm in diameter may be run through the framed cavity, provided they are not fixed to the PowerPanel core. The above services and GPO outlets can penetrate the outer linings without the need for special treatment, provided the clearance between the edge of the opening and the service does not exceed 6 mm for an FRL up to 90/90/90.

4.3.8 Edge details

The proposed head details are shown in Figure 16. The PowerPanel panels are built with a 50 mm Bradford Fibretex 350 Rockwool batt compressed to achieve the required FRL. Small gap cracks and

defects (up to 3 mm) must be filled at the top of the panel with either Hebel adhesive or fire rated sealant.

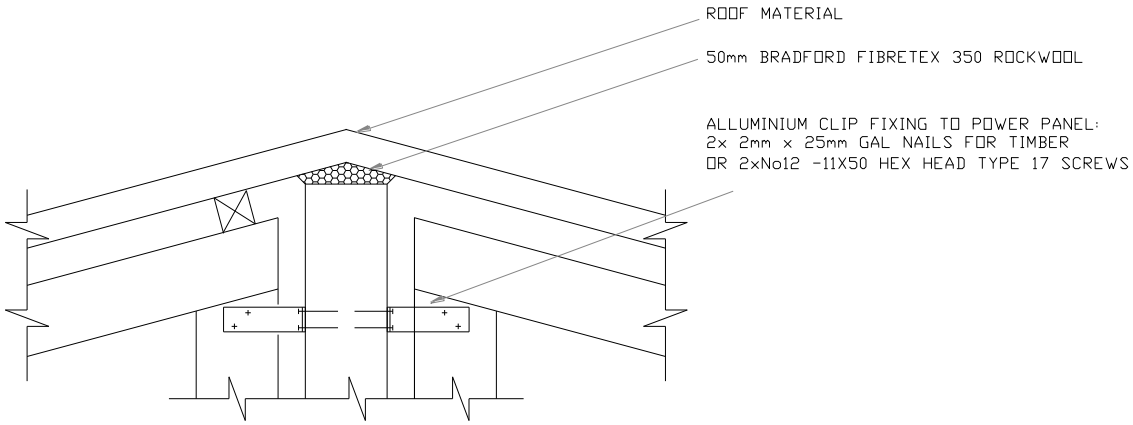


Figure 16 Junction of CSR Hebel partywall and roof

The proposed end detail is shown in Figure 17. The PowerPanel panels are built up to a 50 mm Bradford Fibretex 350 Rockwool compressed to achieve the required FRL.

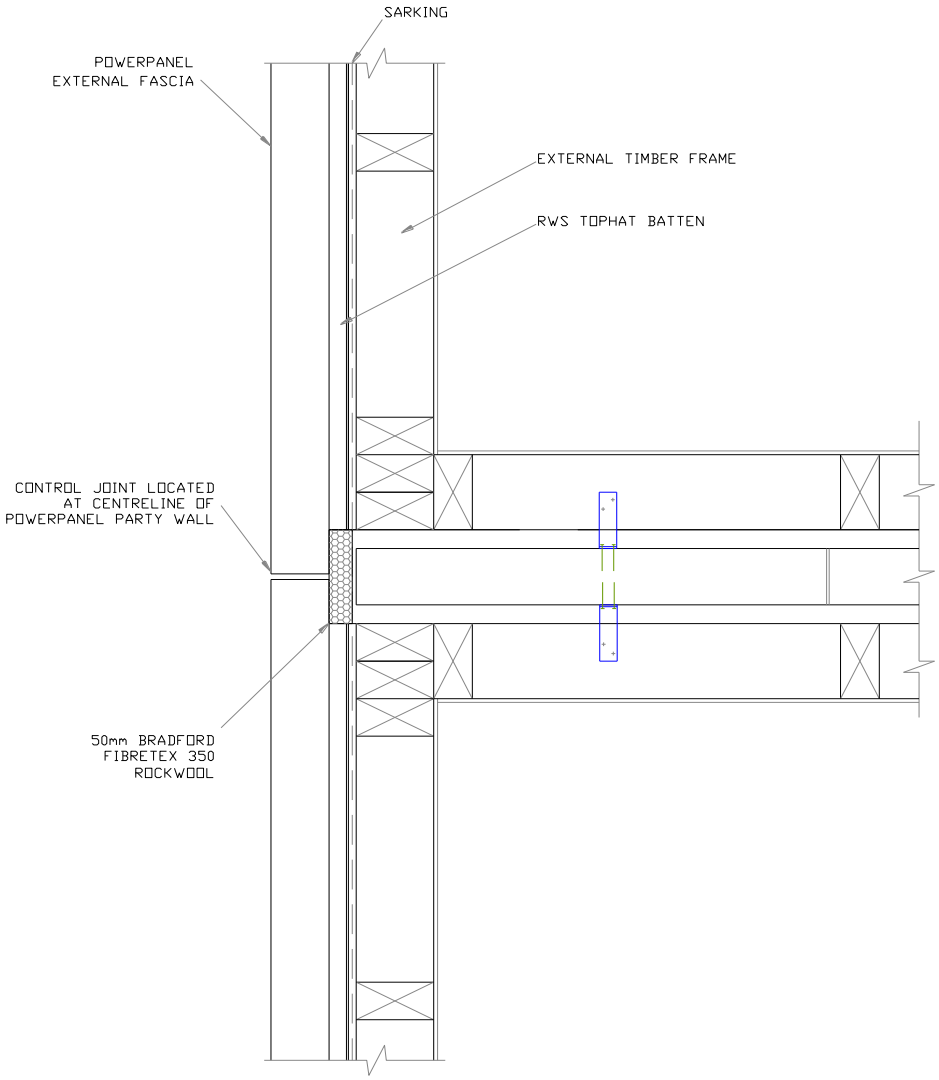


Figure 17 Junction of CSR Hebel partywall and external wall

4.3.9 Eave details

The proposed head details are shown in Figure 18 and Figure 19.

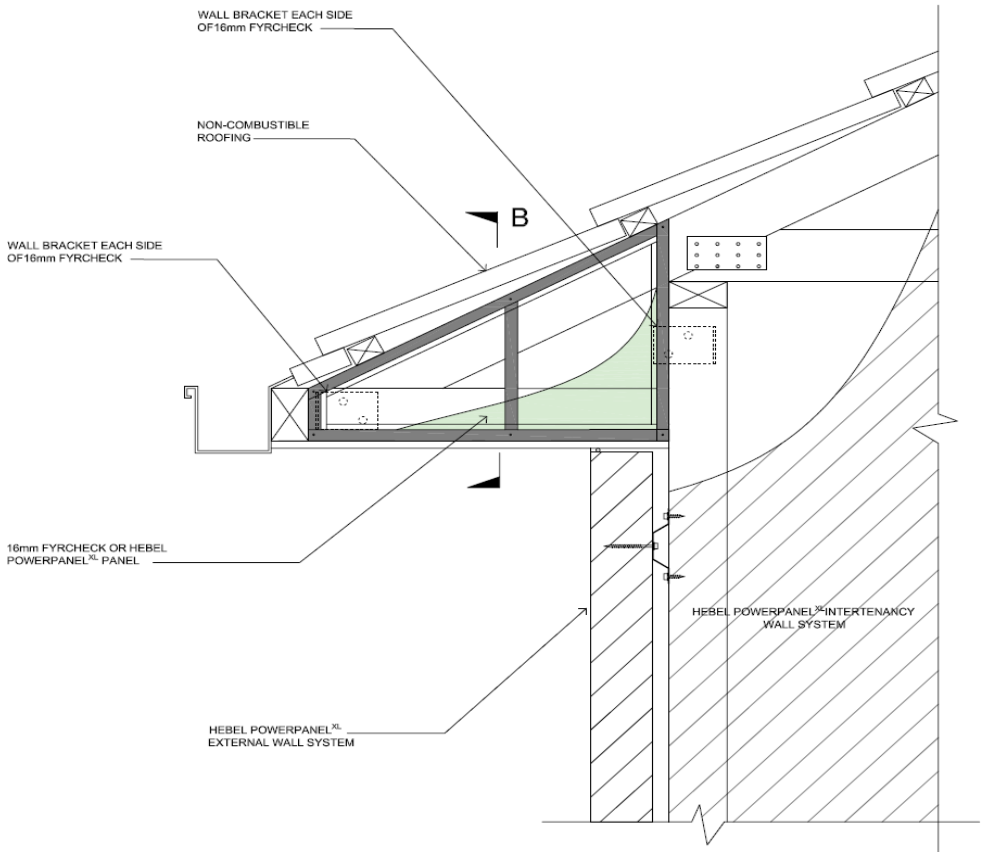


Figure 18 Typical eaves detail

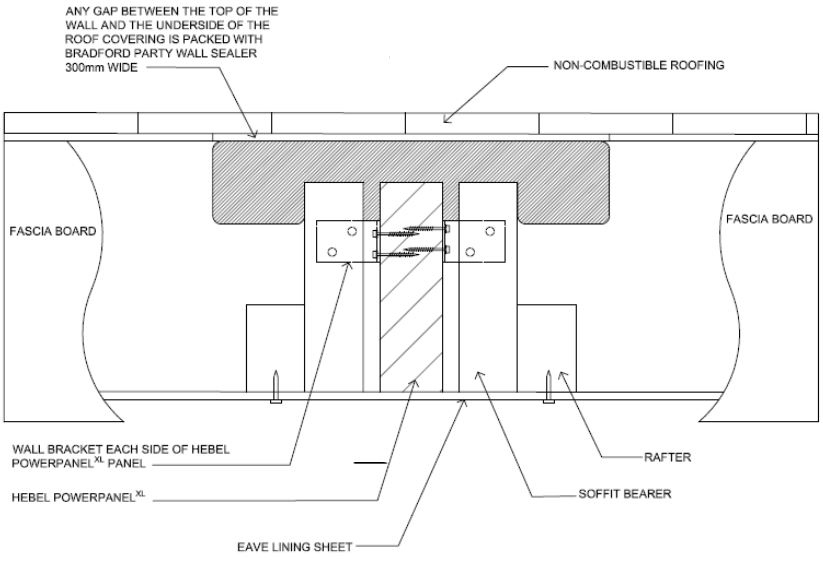


Figure 19 Typical eaves detail using Hebel Powerpanel XL Panel – Section B-B of Figure 18

In Figure 19, 50 mm PowerPanels (dry density 510 kg/m3) may be used instead of the 75 mm Panel.

4.3.10 Variation to gap between frame and panel

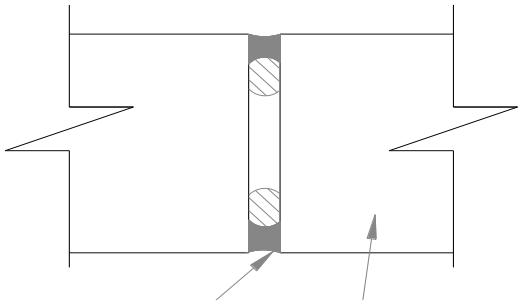
The proposed range of gaps is from 10 mm to 35 mm. The smallest gap allows a minimum wall footprint, whereas the larger thickness allows variation to meet and intersect other walls and remain at the same thickness.

4.3.11 Vertical joints in central PowerPanel core

Vertical joints within 75 mm Hebel panels

It is proposed that vertical joints within the field of 75 mm Hebel panels are formed as shown in Figure 20. The sealant must be applied to both sides of the wall for -/90/90 applications and must have been tested or assessed for protecting a joint in 75 mm CSR Hebel PowerPanel.

It is proposed that vertical joints within the field of 75 mm Hebel panels are formed as shown in Figure 21. The sealant must be applied to one side of the wall for -/60/60 applications and must have been tested or assessed for protecting a joint in 75 mm CSR Hebel PowerPanel.



CSR Fireseal

20 mm wide (max.) and 16 mm deep (min.) over polyethylene backing rod on both sides.

75 mm Hebel PowerPanel

Figure 20 Vertical joint type 1 (-/60/60 and -/90/90 FRL) – 75 mm Hebel AAC panels

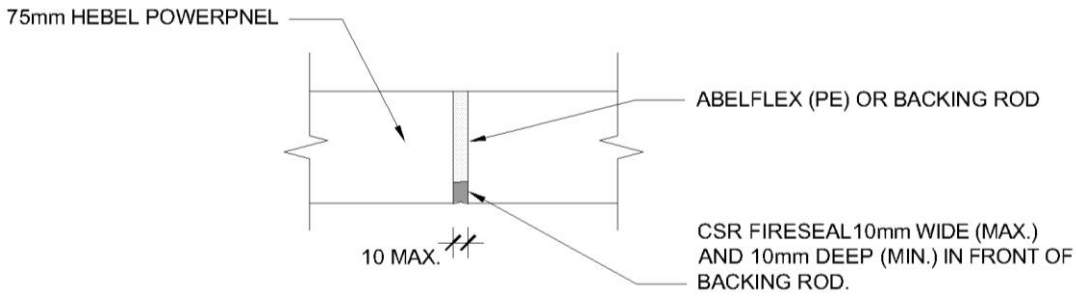


Figure 21 Vertical joint type 2 (-/60/60 FRL) – 75 mm Hebel AAC panels

Vertical joints within 50 mm Hebel panels

It is proposed that vertical joints within the field of 50 mm Hebel panels be formed as shown in Figure 22. Based on the depth of the sealant used, as described in Figure 22, it is proposed that -/90/90 and -/60/60 FRL can be achieved for vertical joints installed within 50 mm Hebel panels. The width of the gap must not be more than 10 mm.

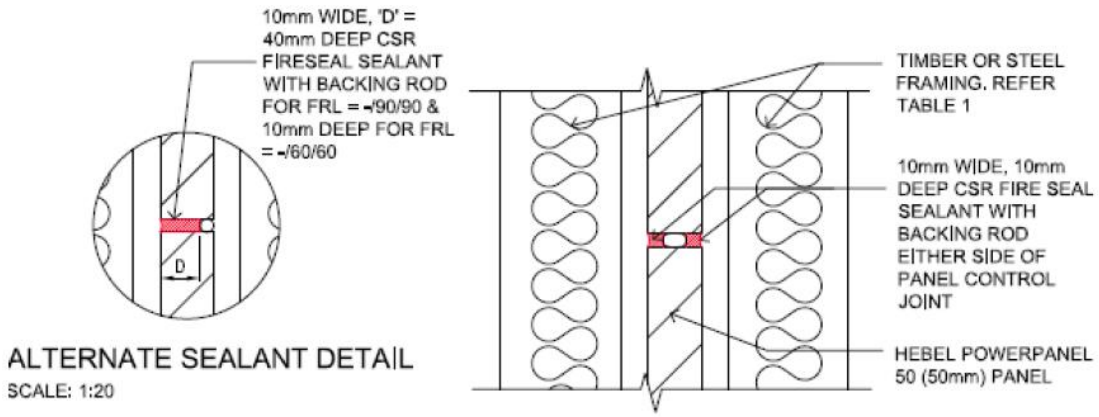


Figure 22 Vertical joint type 3 – 50 mm Hebel AAC panel

Alternatively, a similar joint configuration to that shown earlier in Figure 20, but with a reduced joint width of 10 mm, can be used in a 50 mm Hebel panel with backing rods installed on both sides at a depth of 10 mm, covered with sealant for the entire 10 mm depth to achieve an FRL of -/90/90 – as shown in Figure 23.

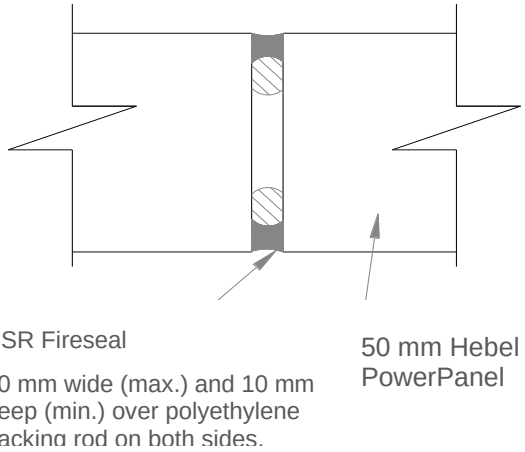


Figure 23 Vertical joint type 4 (-/90/90) – 50 mm Hebel AAC panels

4.3.12 Variation of partywall with overhang over ground floor veranda

The party wall system is varied optionally with the construction of the non-discontinuous party wall overhanging over the common ground floor veranda as shown in Figure 24 and Figure 25.

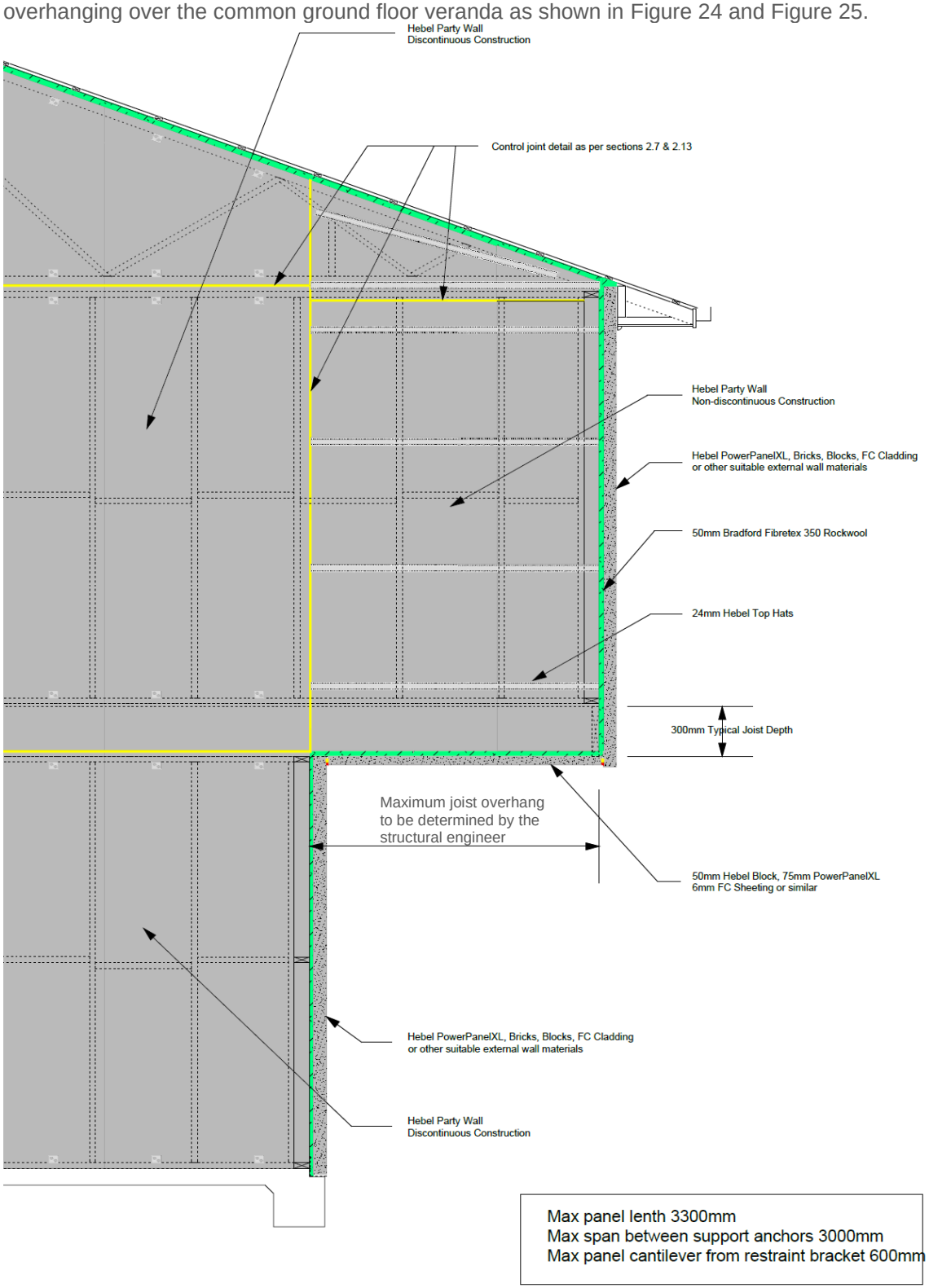


Figure 24 Sectional elevation of non-discontinuous Hebel party wall overhang

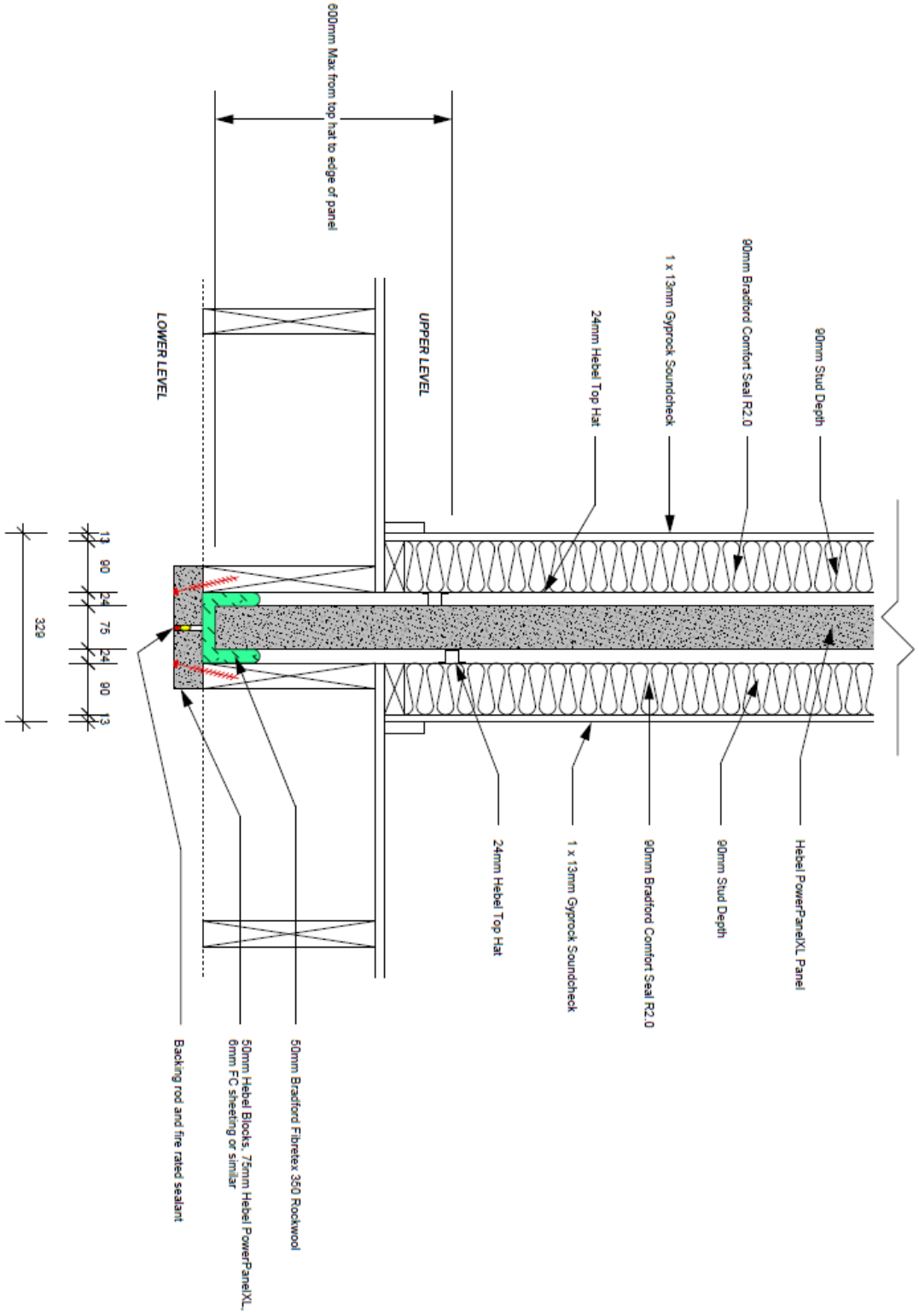


Figure 25 Façade cross-sectional elevation of non-discontinuous Hebel party wall overhang

4.3.13 Treatment of the party wall overhang

It is proposed that some constructions of the party wall abutting the external wall involve an overhang over the common veranda of the ground floor, as shown in Figure 24 and Figure 25.

The tests and previous assessment had been based on a vertical wall without overhang. The calculations and the test specimen have allowed for up to 12 m or 16.5 m high party walls with 75 mm Hebel panels and 7.2 m high party walls with 50 mm Hebel panels. The extra cantilever would need to be examined by structural engineers, not part of the referenced assessment, to ensure that the wall is adequately supported and that there is no additional load that would introduce deflections at various locations that could have a detrimental impact on the structural adequacy of the wall when exposed to fire on either side.

Being a non-discontinuous wall, the overhanging part of the Hebel AAC wall is supported by the timber frames on either side, which in turn transfer that load to the timber joists. Particularly, the maximum joist overhang must be verified via the structural engineer's design to be adequate to withstand the additional forces and overturning moments created by the cantilevered part of the structure.

The detail shown in Figure 25 provides for both flame separation and continuity of insulation in the event of a fire developing from the underfloor section of either tenancy. The installation of Hebel block segments to the exposed side would help prevent a potential flame crossover to the unexposed tenancy side. Furthermore, a fire rated ceiling or floor system tested or otherwise assessed by others as achieving an FRL of 60/60/60 or 90/90/90 must be installed to the underside of the joists to prevent fire ingress and hot gases from entering the floor structure, which will otherwise affect the stability of the Hebel overhang party wall system in the fire state. The core of the Hebel party wall is extended all the way to the soffit of the external ground floor ceiling (over the veranda).

For all intents and purposes, the details indicate that continuity on the Hebel Party wall is maintained from the base or ground to the roof as if it were a straight, continuous wall. The fire resistance of the wall will therefore perform adequately as per the specimen Hebel party wall tested and assessed in the referenced assessment report. This is conditional on the cantilevered structure, including the timber floor joists, being adequately designed to withstand the design action effects determined by the structural engineer.

4.3.14 Overhang in Hebel panel (in discontinuous wall) adjacent to cantilevered partywall (non-discontinuous wall)

It is proposed that the vertical Hebel panel that is located at the edge of the discontinuous partywall within the main structure can be offset by a limited amount towards the cantilevered part, as shown in Figure 26. The maximum allowable wall height (H) varies with the overhang, as shown in Table 5. This height – as indicated in Figure 26 – includes the height of the Hebel panel with the roof space as well. Therefore, care should be taken by the report sponsor, building designers and builders not to exceed the allowable total Hebel wall heights. The maximum overhang allowed is 200 mm.

The vertical edge of this Hebel panel towards the interior of the main structure (left edge of the panel highlighted in blue in Figure 26) must be glued to the adjacent Hebel panel using Hebel adhesive. The vertical edge on the side of the cantilevered structure must be a vertical control joint which does not transfer any loads from the adjoining structure to this Hebel panel (similar to that shown in Figure 24).

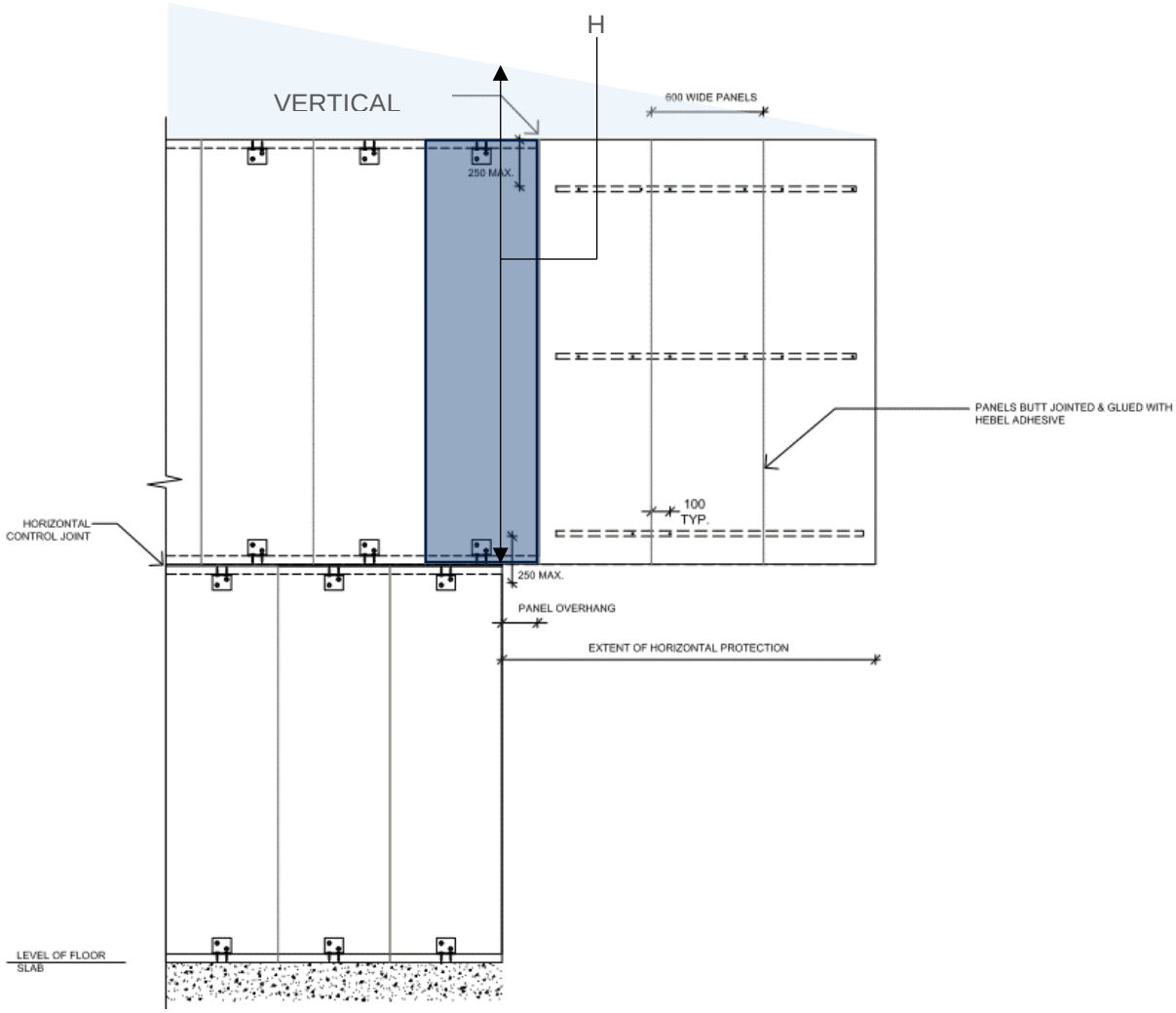


Figure 26 Overhang in Hebel panel (in discontinuous wall) adjacent to cantilevered partywall (non-discontinuous wall)

Table 5 Hebel panel overhang versus overhanging panel height

Overhang in Hebel panel	Total height of overhanging Hebel panel – first storey + roof space (H – in Figure 26)
200 mm	3.3 m
175 mm	3.4 m
150 mm	3.5 m
125 mm	3.6 m
100 mm	3.8 m
75 mm	3.9 m
50 mm	4.1 m
25 mm	4.2 m

4.3.15 Cantilevered (discontinuous) overhang supported with steel angles

Figure 27, Figure 28 and Figure 29 show cantilevered discontinuous intertenancy wall systems – notionally similar to the one shown in Figure 24 – with the cantilevered distance determined by a professional structural engineer. Instead of steel top hat sections, Aluminium clips are used on each side of the Hebel core to fix it to the timber or steel framing. The Hebel core is supported on galvanised steel angles on each side, spaced at 600 mm maximum centres and offset by 300 mm. The gauge and size of these steel angles must be determined by a professional structural engineer to adequately support the Hebel core from one side at ambient and fire conditions. The bottom horizontal leg of the steel angle must fully support the width of the Hebel panel – as shown in Figure 27 to Figure 29. Compressed Bradford Fireseal Party Wall Sealer must be used as indicated in the figures as a cavity barrier between the two sides. The proposed detail is applicable to party walls built using 50 mm or 75 mm Hebel AAC panels.

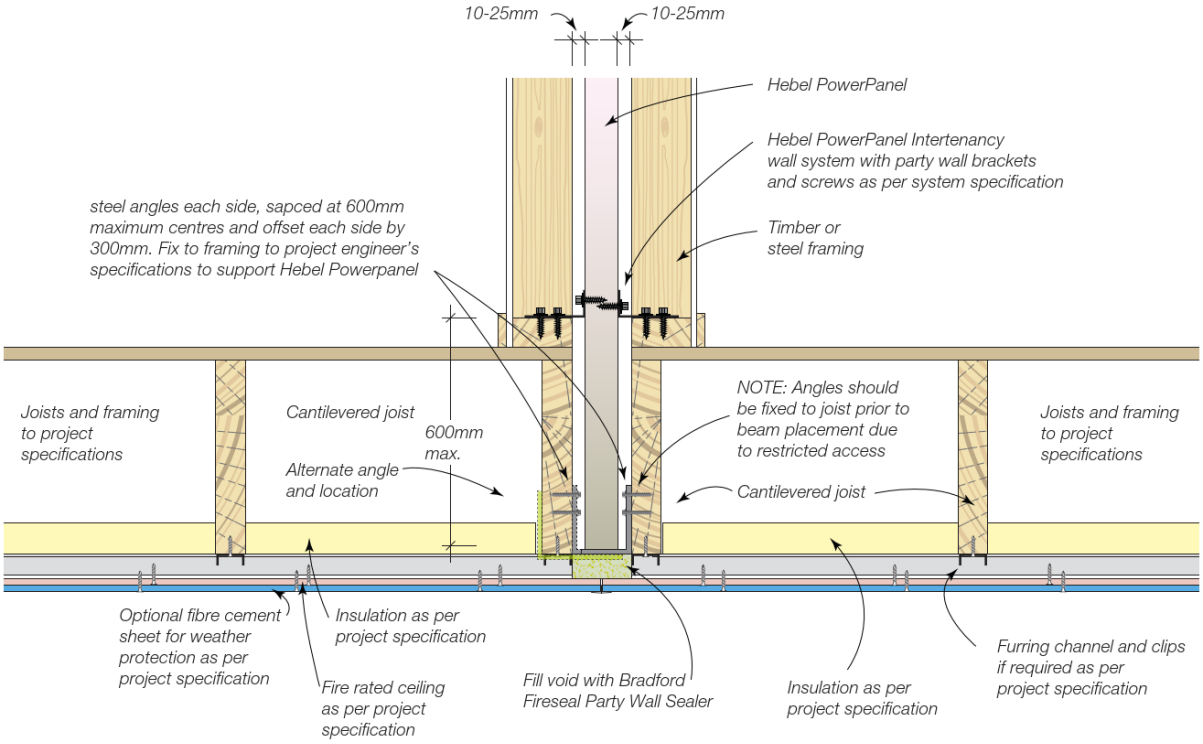


Figure 27 Cantilevered intertenancy system supported with steel angles – level soffit – 1

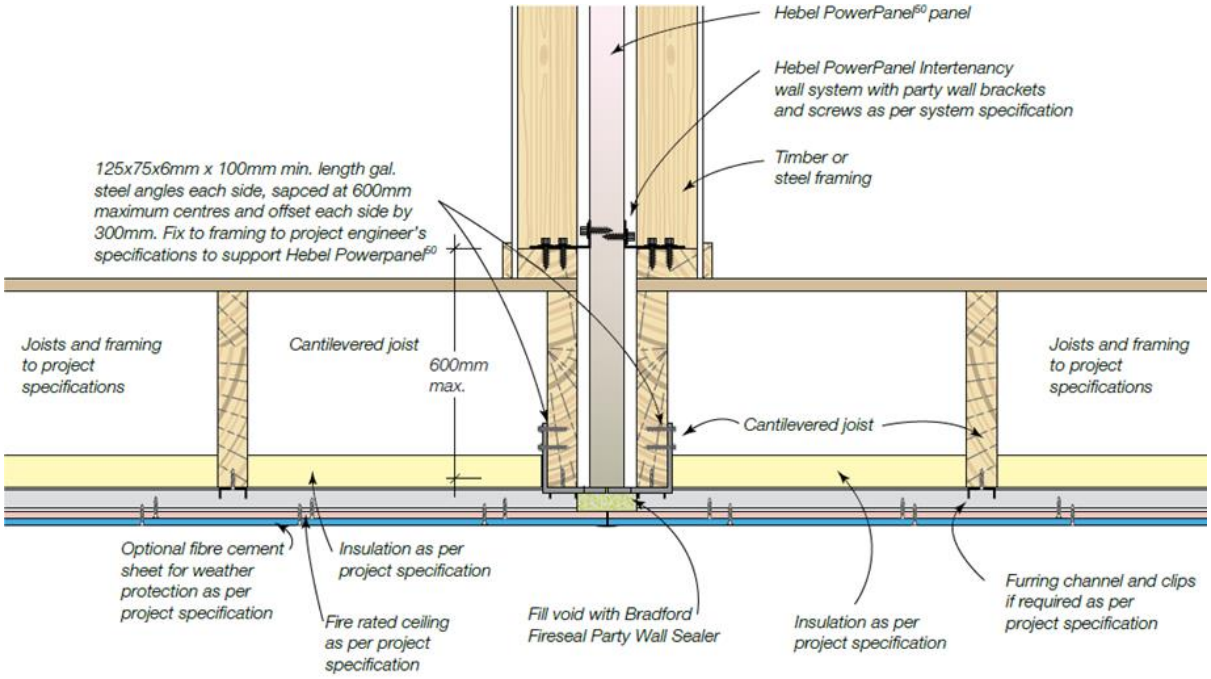


Figure 28 Cantilevered intertenancy system supported with steel angles – level soffit – 2

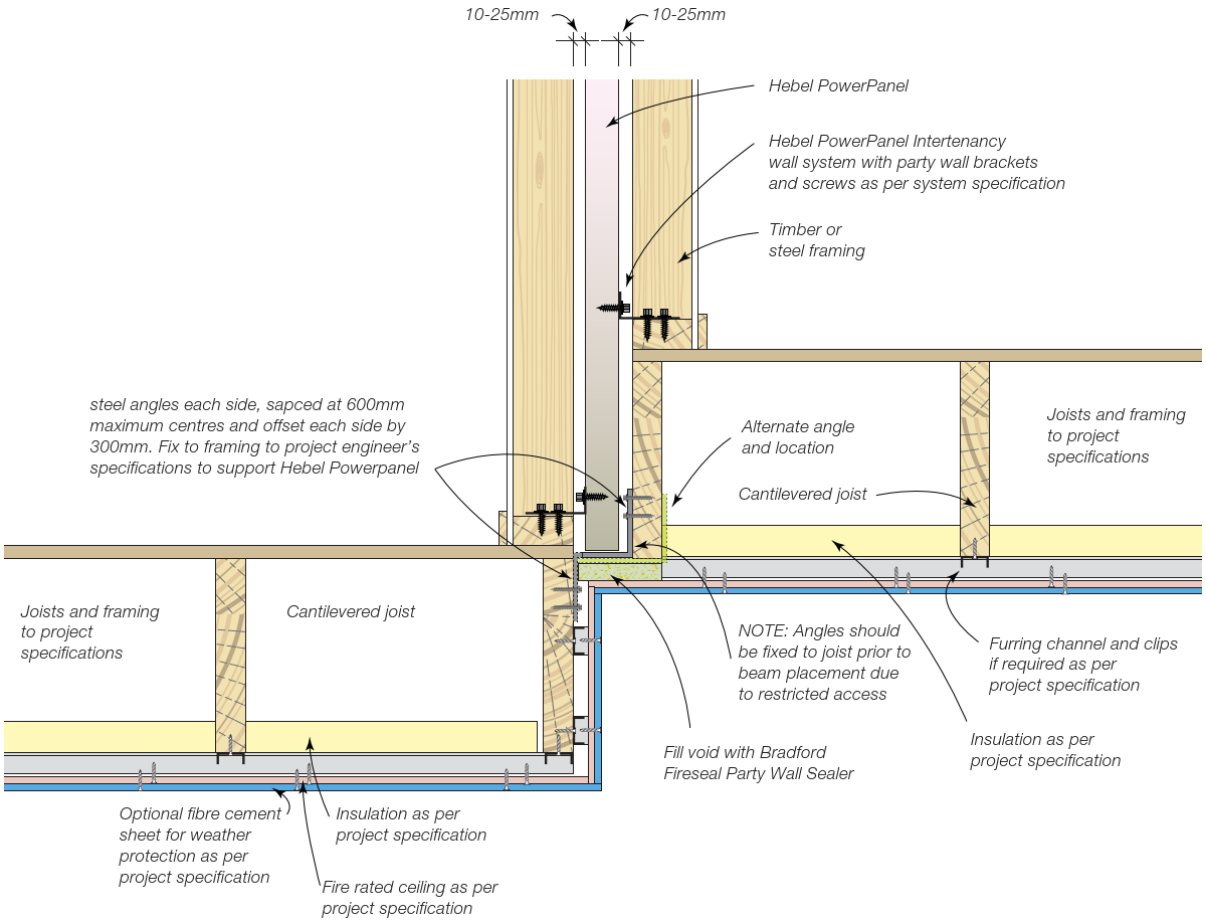


Figure 29 Cantilevered intertenancy system supported with steel angles – stepped soffit

4.3.16 Base details at stepped slab

The base details shown in Figure 30 and Figure 31 are proposed for partywalls built using 50 mm and 75 mm Hebel panels at stepped slabs. In both cases, the spacing between the first set of aluminium brackets on either side of the wall at the first floor level must not be spaced more than 3000 mm and 2900 mm away from the base slab level of the respective side for 75 mm and 50 mm Hebel panels, respectively.

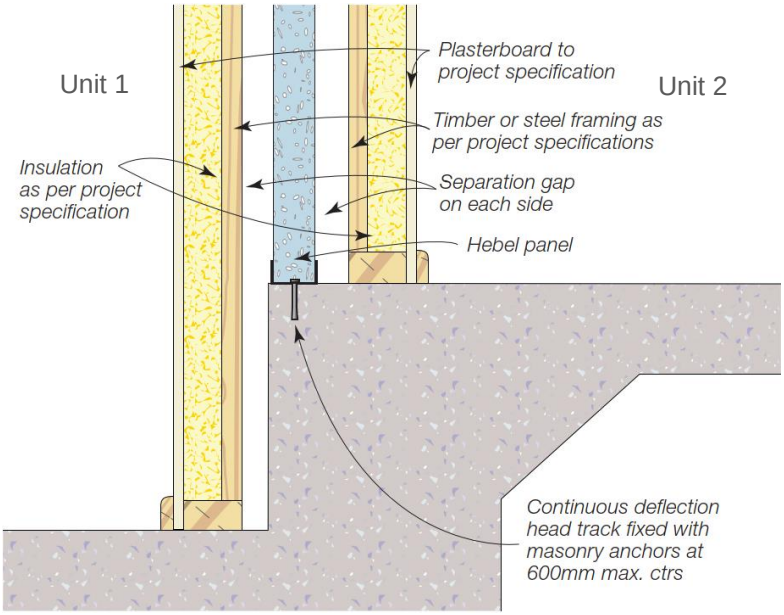


Figure 30 Base detail at stepped slab (Option 1)

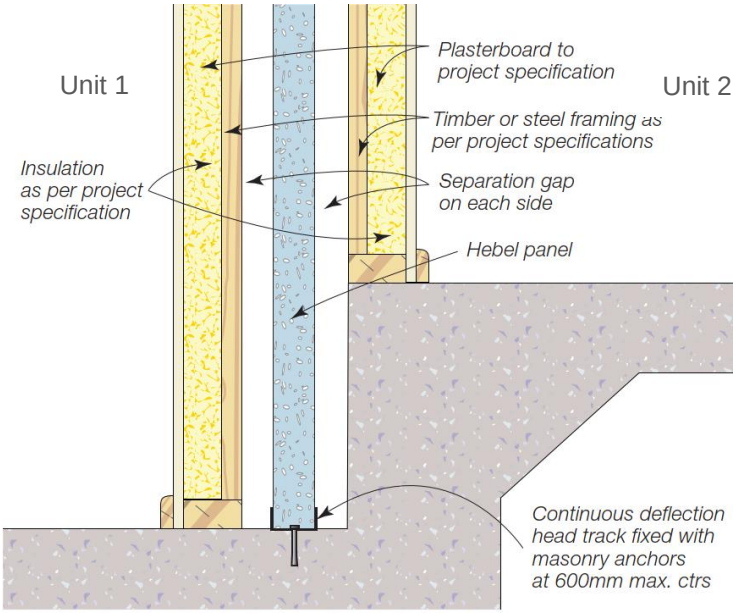


Figure 31 Base detail at stepped slab (Option 2)

4.3.17 4-way intersection details

It is proposed that the 4-way intersection detail shown in Figure 32 and Figure 33 can be used to achieve FRLs of -/90/90 and -/60/60, respectively. One set of side abutting Hebel panels shall be fixed using Hebel joint adhesive to maintain the monolithic nature of that fire core. While the orthogonal fire core is discontinuous, the control joint system is used to provide the required level of fire separation between the tenancy units.

The control joint details for partywalls built with 75 mm Hebel panels proposed to achieve FRLs of -/90/90 and -/60/60 shall be in compliance with the vertical joint systems described earlier in section 4.3.11 (Figure 20 and Figure 21 for -/90/90 and -/60/60, respectively).

The control joint details for partywalls built with 50 mm Hebel panels proposed to achieve FRLs of -/90/90 and -/60/60 shall be in compliance with the vertical joint systems described earlier in section 4.3.11 (Figure 22 and Figure 23 for -/90/90 or -/60/60).

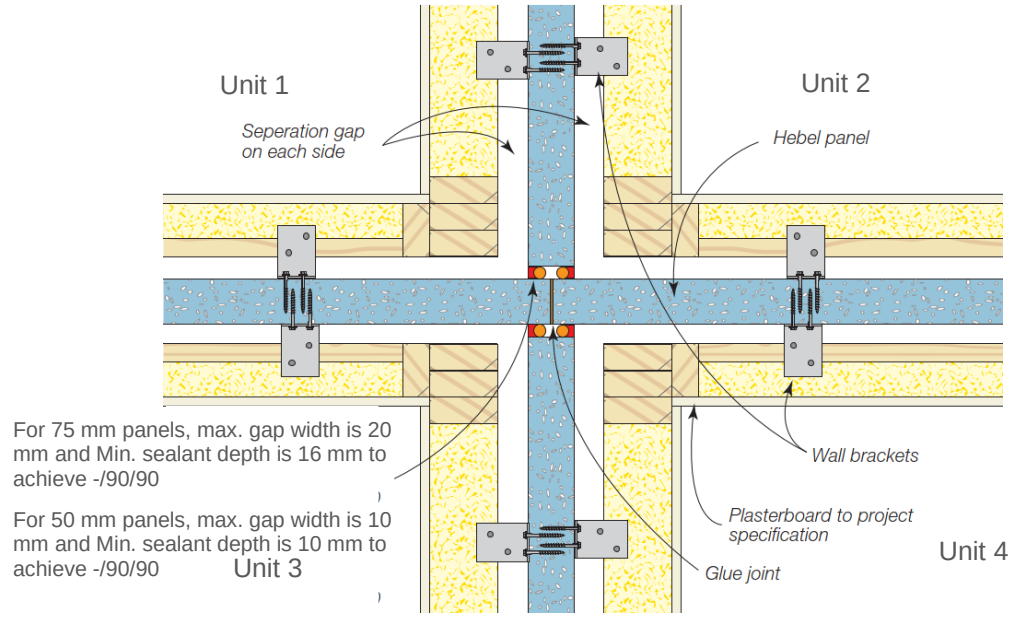


Figure 32 4-way Intersection – Protection from both sides

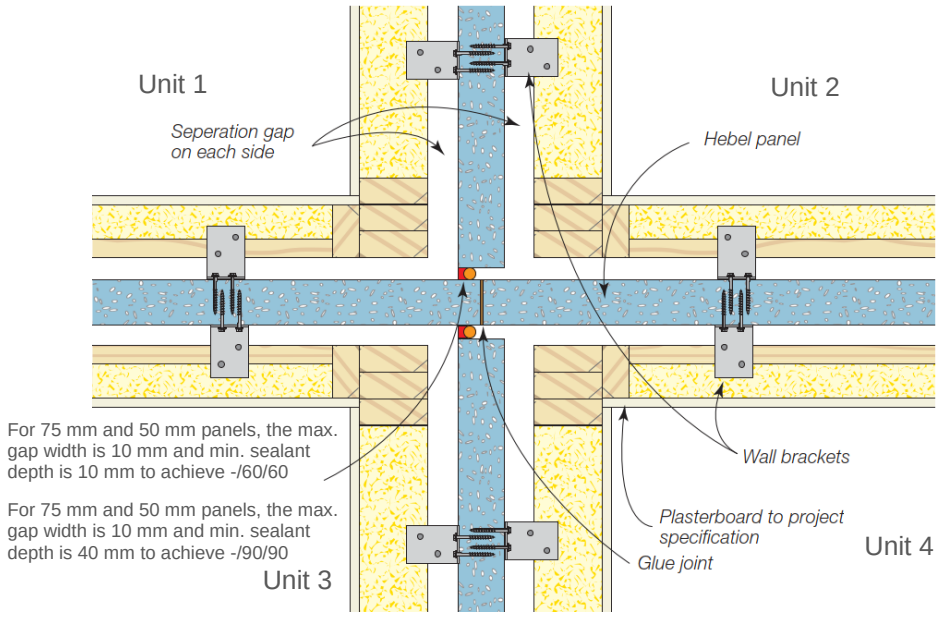


Figure 33 4-way Intersection – Protection from one side only

4.3.18 Base detail at subfloor

It is proposed that the base detail shown in Figure 34 is adequate to achieve a fire separation FRL of -/90/90 between the tenancy units on either side of the wall. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

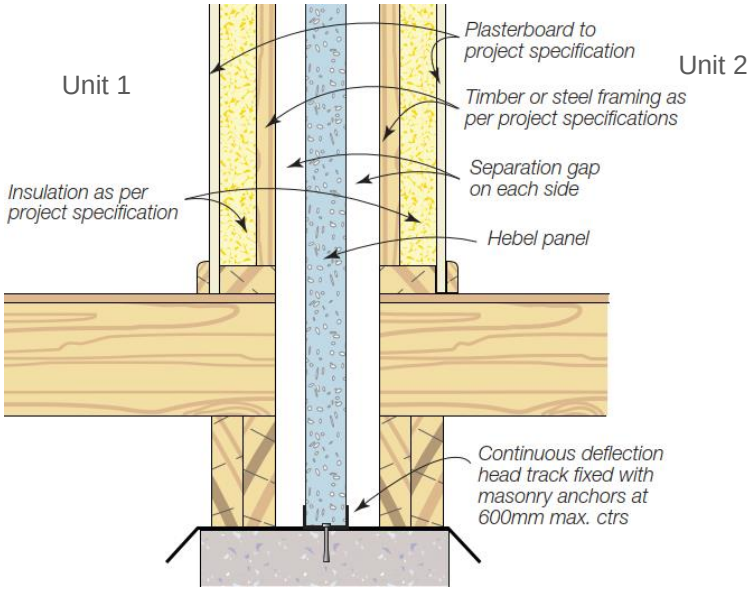


Figure 34 Base detail at subfloor

4.3.19 NIB junction detail for Hebel partywall and external wall system

It is proposed that the detail shown in Figure 35 is used for nib junctions between Hebel partywalls and external walls to achieve a fire separation with an FRL of -/90/90 between the intertenancy units. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

Installing the wall wrap/sarking over the Bradford Fireseal Partywall sealer would not compromise the fire performance of the system.

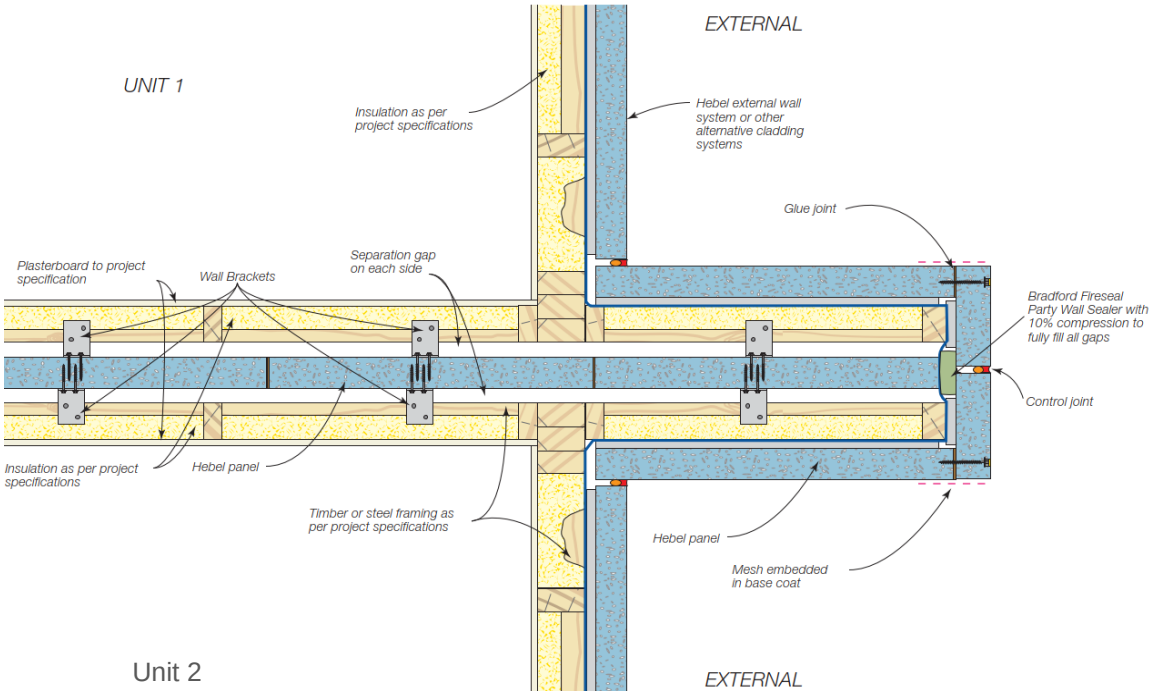


Figure 35 Nib junction detail of Hebel partywall and external wall system

4.3.20 Junction detail for Hebel partywall and external wall system

It is proposed that the detail shown in Figure 36 is used for junctions between Hebel partywalls and external walls to achieve a fire separation with an FRL of -/90/90 between the tenancy units. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

Installing the wall wrap/sarking over the Bradford Fireseal Partywall sealer would not compromise the fire performance of the system.

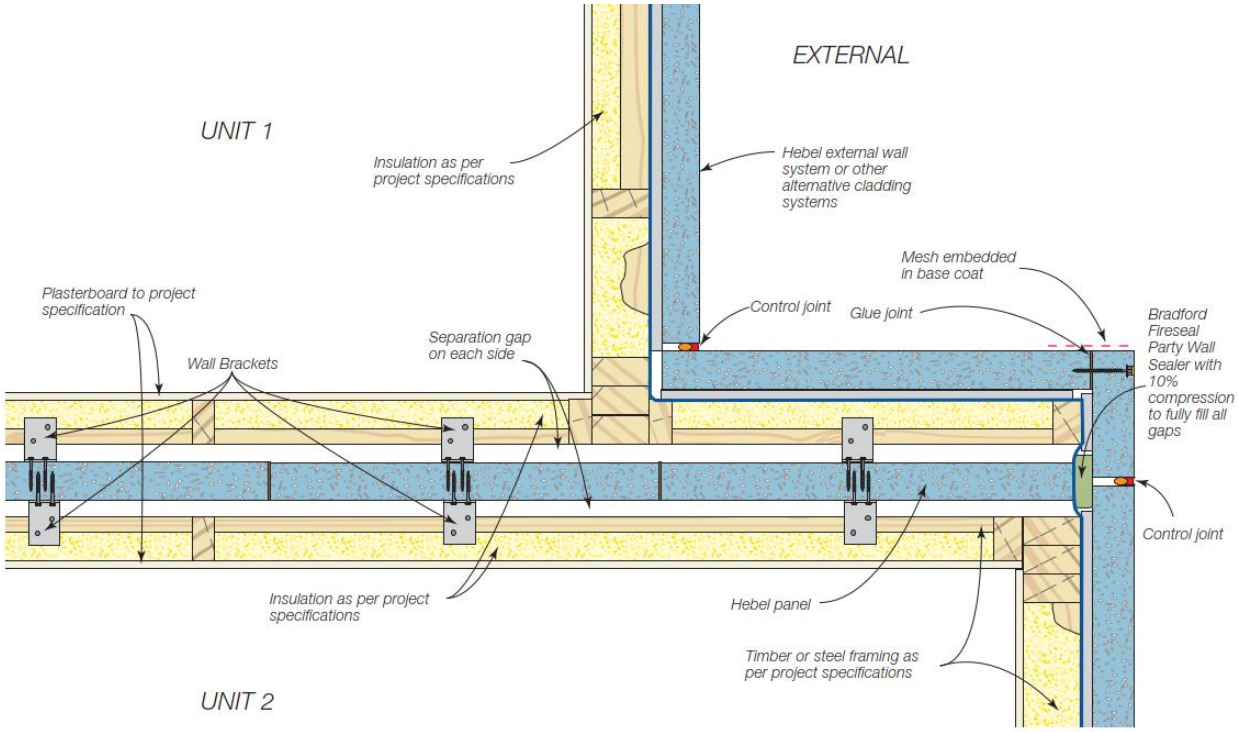


Figure 36 Junction detail of Hebel partywall and external wall system

4.3.21 Junction detail of Brick veneer and Hebel partywall

It is proposed that the detail shown in Figure 37 is used for junctions between Hebel partywalls and brick veneer walls to achieve a fire separation with an FRL of -/90/90 between the tenancy units. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

The Bradford Fireseal Partywall sealer shall be friction fit for an adequate distance on either side of the joint between the timber frame and the brick veneer.

Installing the wallwrap/sarking over the Bradford Fireseal Partywall sealer would not compromise the fire performance of the system.

The fire resistance performance of the external masonry wall system does not form part of the referenced assessment.

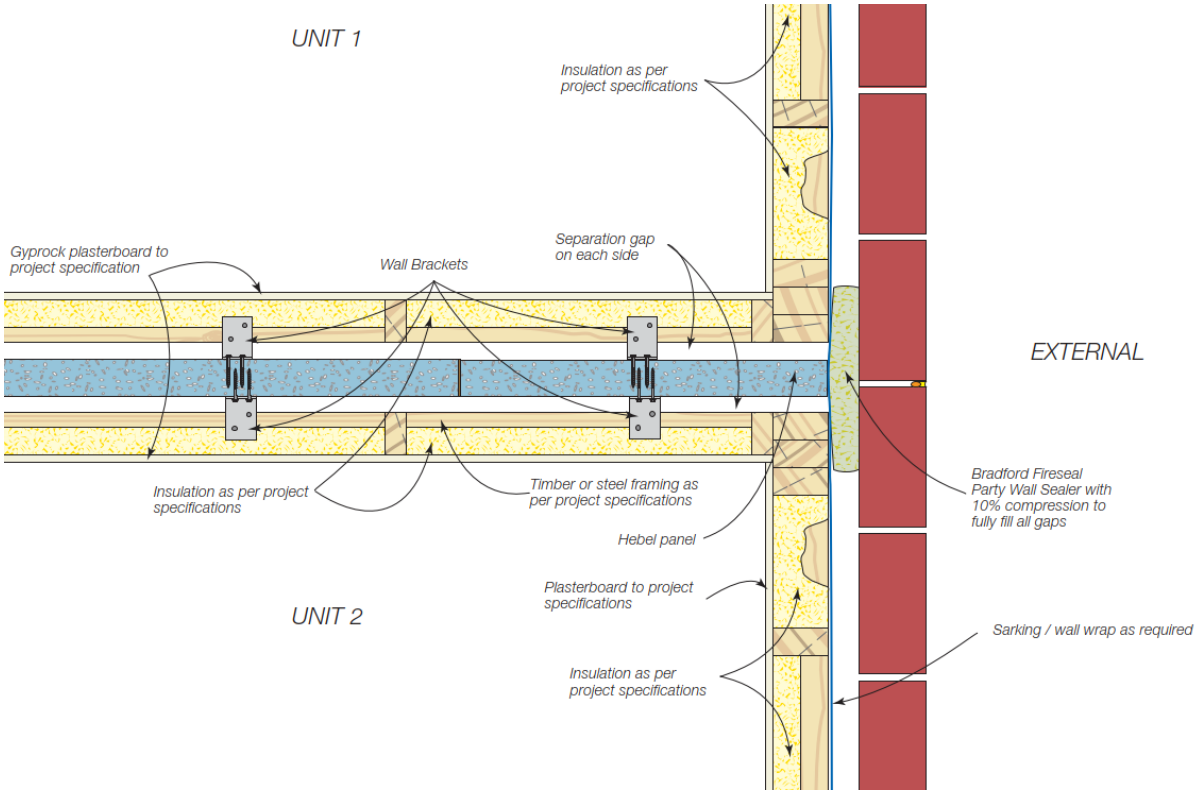


Figure 37 Junction detail of brick veneer and Hebel partywall

4.3.22 Junction detail of externally cladded wall and Hebel partywall

It is proposed that the detail shown in Figure 38 is used for junctions between Hebel partywalls and framed walls with external lightweight cladding to achieve a fire separation with an FRL of -/90/90 between the tenancy units. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

Furthermore, it is proposed that the details shown in Figure 39 and Figure 40 are used for junctions between Hebel partywalls and framed walls with external lightweight cladding directly fixed to the studs to achieve a fire separation with an FRL of -/90/90 between the tenancy units. For gap widths not exceeding 10 mm, CSR Fireseal sealant may be used for the full depth (Figure 39). For larger gaps, compressed Bradford Fireseal Partywall Sealer must be used (Figure 40).

Installing the wall wrap/sarking over the Bradford Fireseal Partywall sealer would not compromise the fire performance of the system.

The fire resistance performance of the externally cladded wall systems does not form part of the referenced assessment.

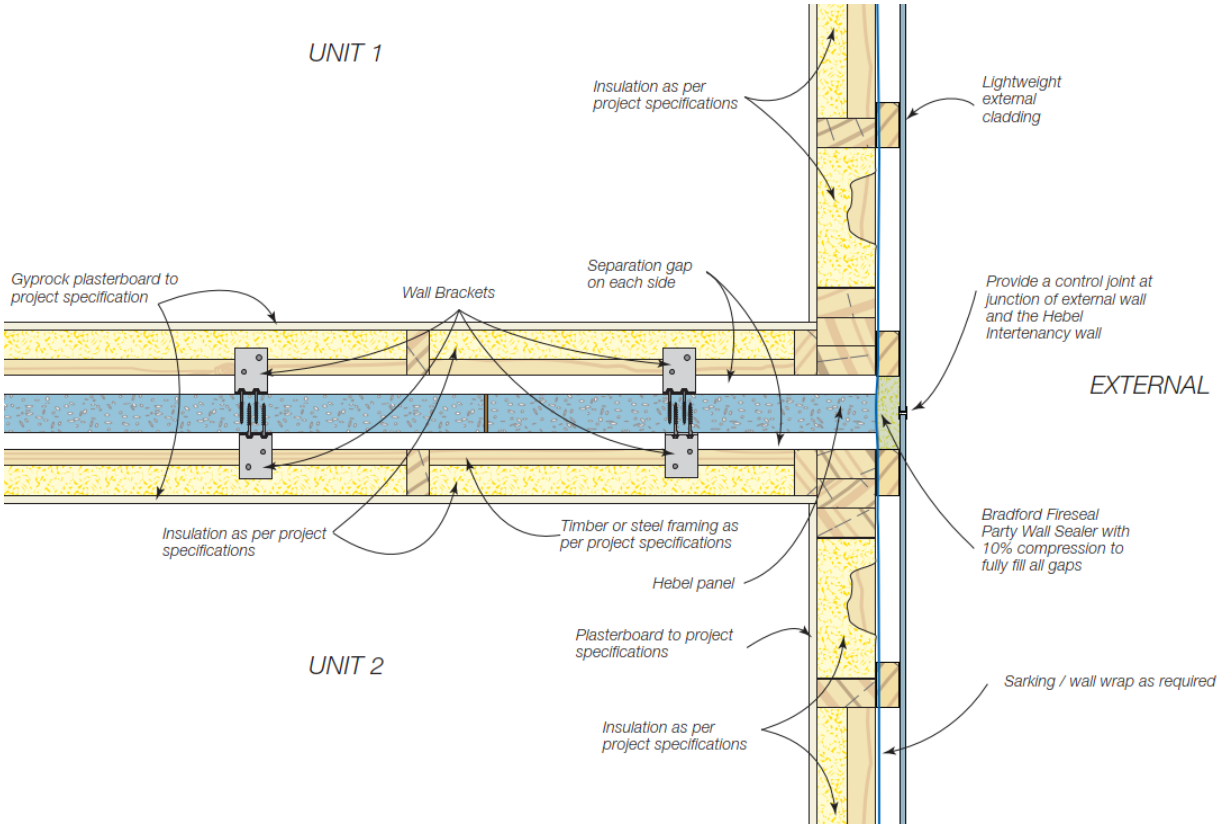


Figure 38 Junction detail of lightweight external cladding and Hebel partywall

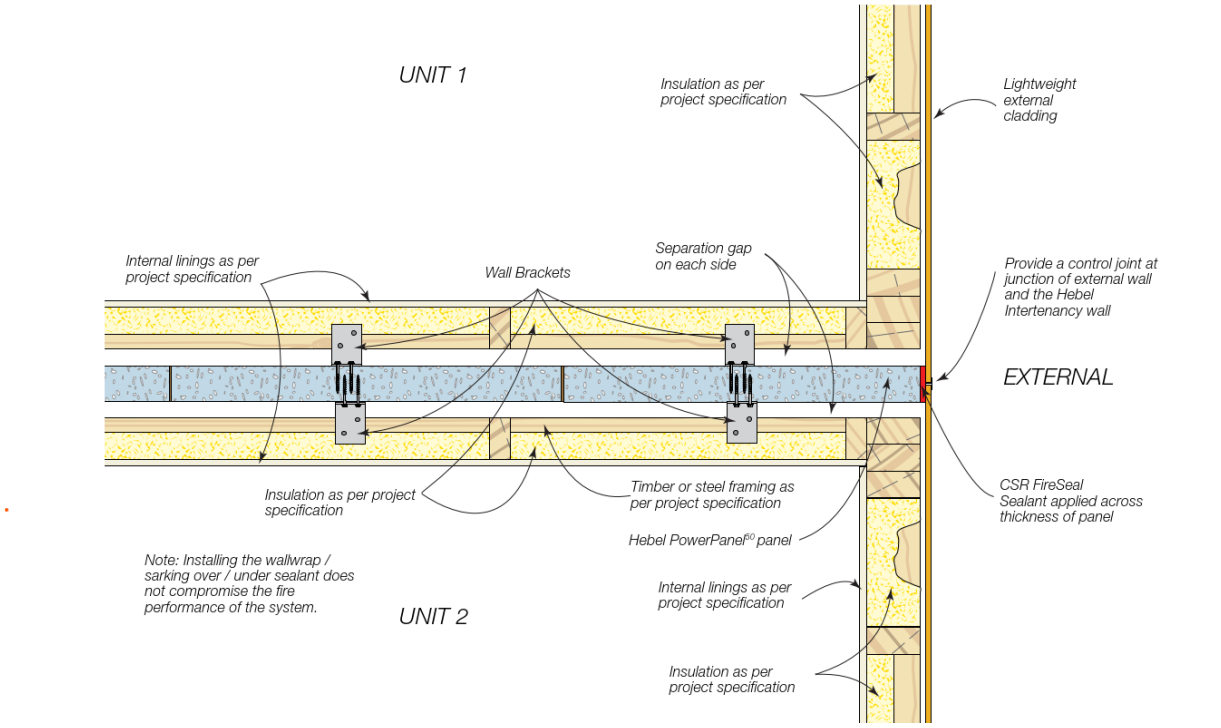


Figure 39 Junction detail of lightweight external cladding (direct fixed to studs) and Hebel partywall – junction width < 10 mm

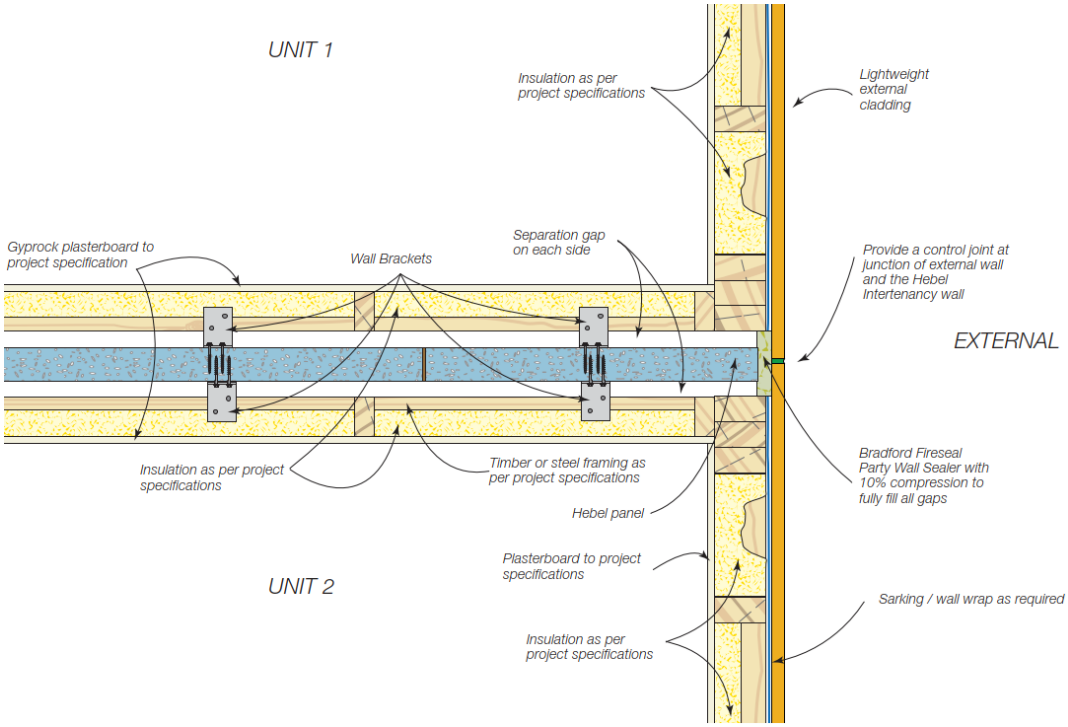


Figure 40 Junction detail of lightweight external cladding (direct fixed to studs) and Hebel partywall

4.3.23 Corner junction detail for Hebel partywalls

It is proposed that the detail shown in Figure 41 is used for corner junctions within Hebel party walls to achieve a fire separation with an FRL of -/90/90. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

The control joint details for the -/90/90 shall be in compliance with the vertical joint system described earlier in section 4.3.11.

Installing the wall wrap/sarking over the Bradford Fireseal Partywall sealer would not compromise the fire performance of the system.

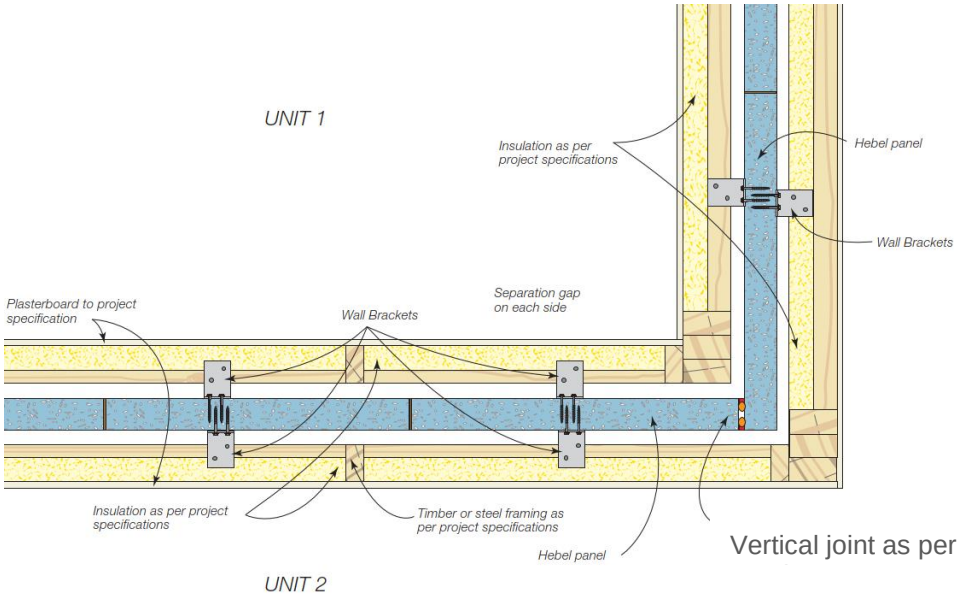


Figure 41 Corner junction detail for Hebel partywalls

4.3.24 Hebel partywall detail at stepped roof/ceiling

The proposed Hebel partywall detail at a stepped roof/ceiling, to achieve a FRL of -/90/90, is as shown in Figure 42. It is proposed that this detailing is adequate to maintain an FRL of -/90/90 between the two tenancies as well as from the exterior fire exposure within the stepped part of the roof. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

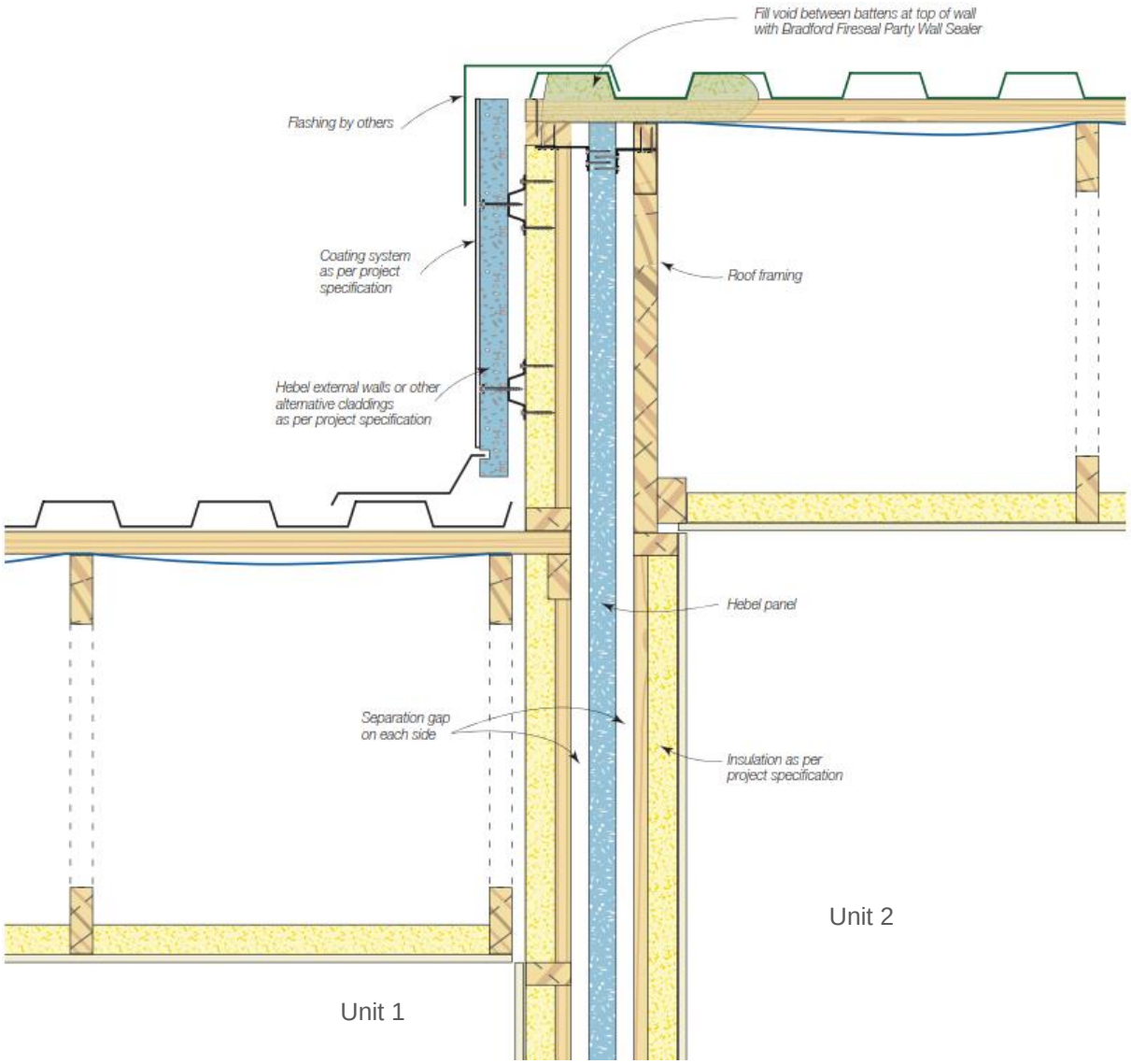


Figure 42 Hebel partywall detail at stepped roof/ceiling

4.3.25 Ceiling and roof detail

The proposed detail between a tile roof and Hebel party wall to achieve and FRL of -/90/90 within the ceiling space is as shown in Figure 43. The Bradford partywall sealer should be at least 300 mm wide. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

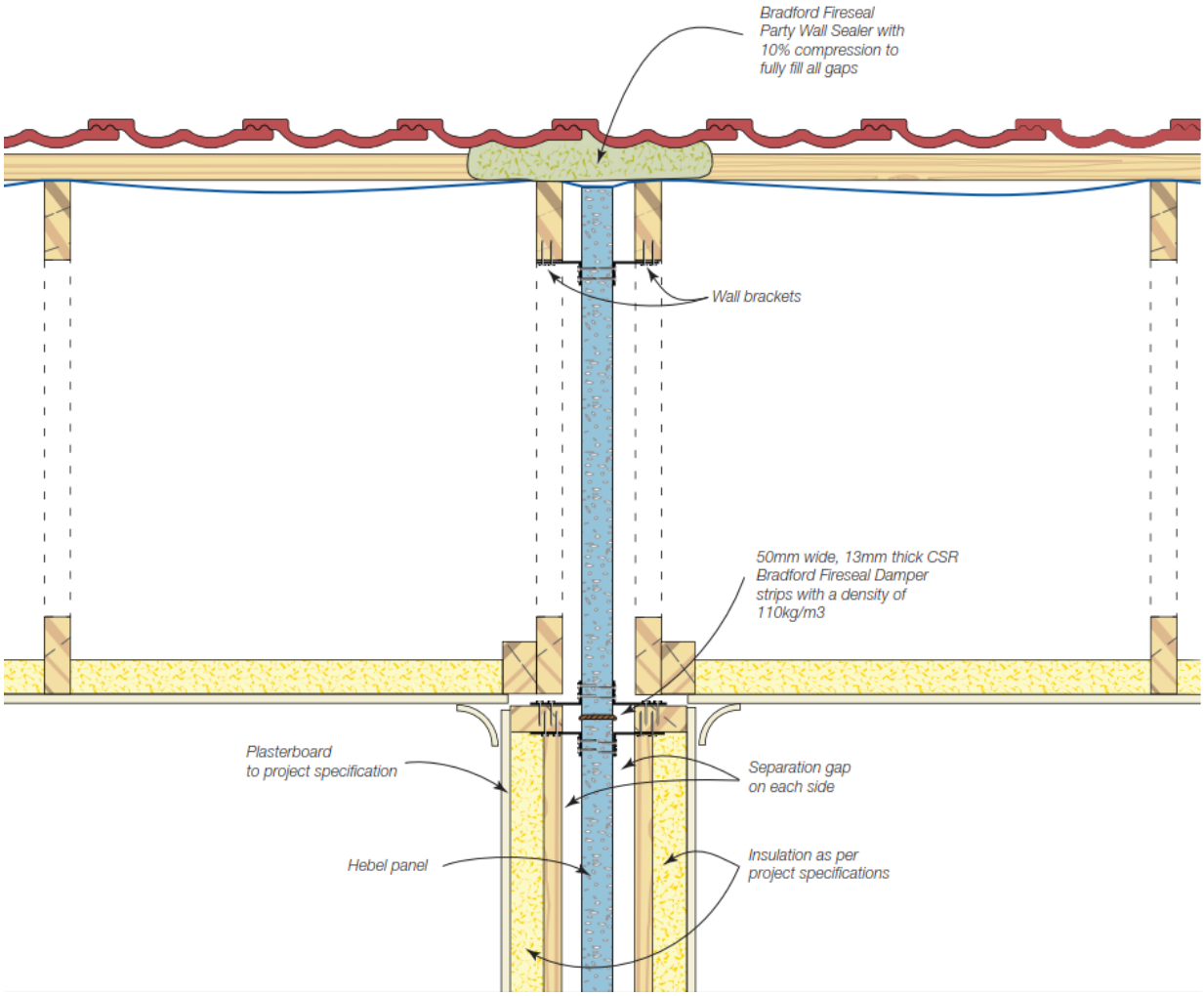


Figure 43 Ceiling and roof detail

4.3.26 Hebel partywall to external wall detail at stepped roof – 1

The proposed detail at a stepped roof, where the Hebel partywall transforms into an external wall, is as shown in Figure 44. It is proposed that this detailing is adequate to maintain an FRL of -/90/90 between the two tenancies as well as from the exterior fire exposure within the stepped part of the roof. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

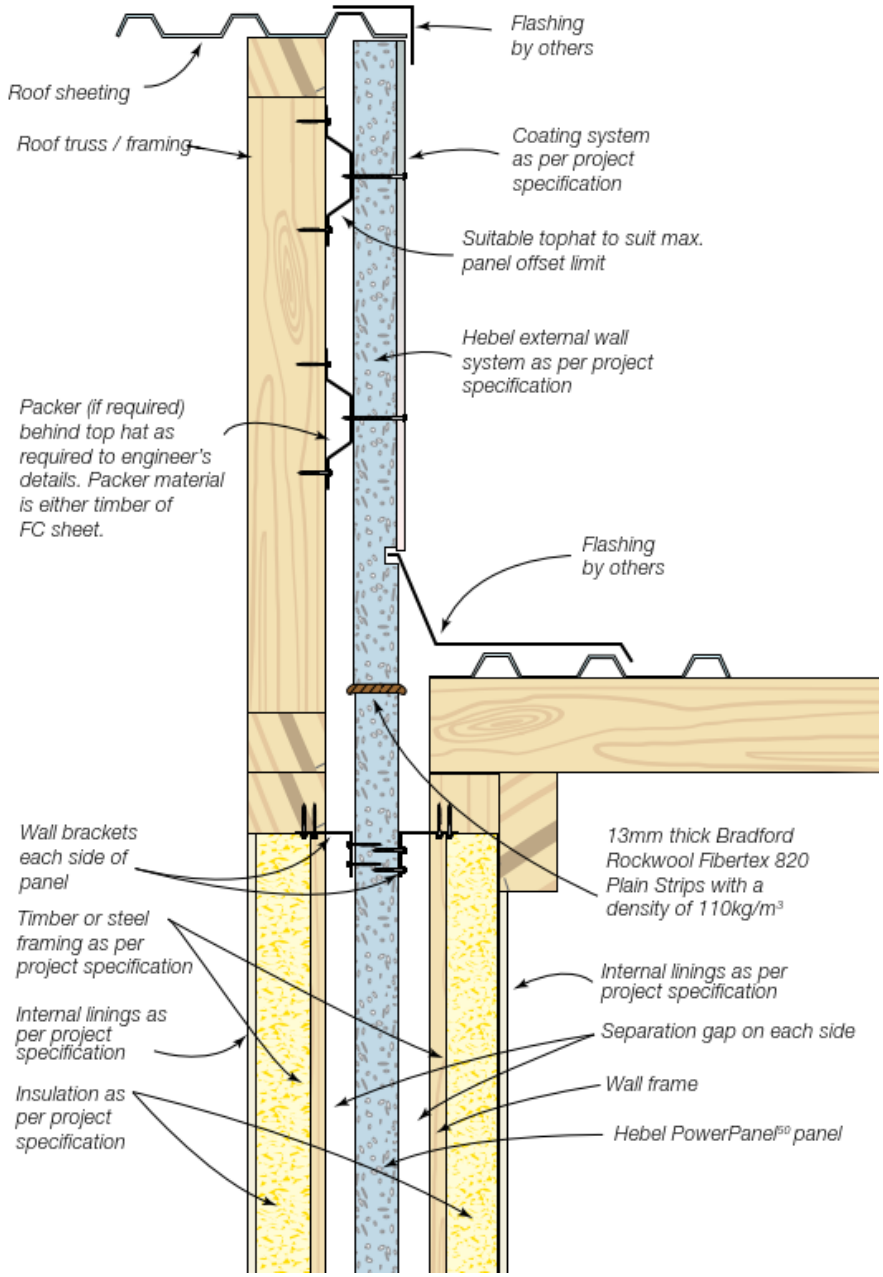


Figure 44 Hebel partywall to external wall detail at stepped roof – 1

4.3.27 Hebel partywall to external wall detail at stepped roof – 2

The proposed detail at a stepped roof, where the Hebel partywall transforms into an external wall, is as shown in Figure 45. It is proposed that this detailing is adequate to maintain an FRL of -/90/90 between the two tenancies. The FRL for exterior fire exposure within the stepped part of the roof depends on the 16 mm fire rated plasterboard provided and should conform to the prescribed details in relevant plasterboard installation manuals. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels.

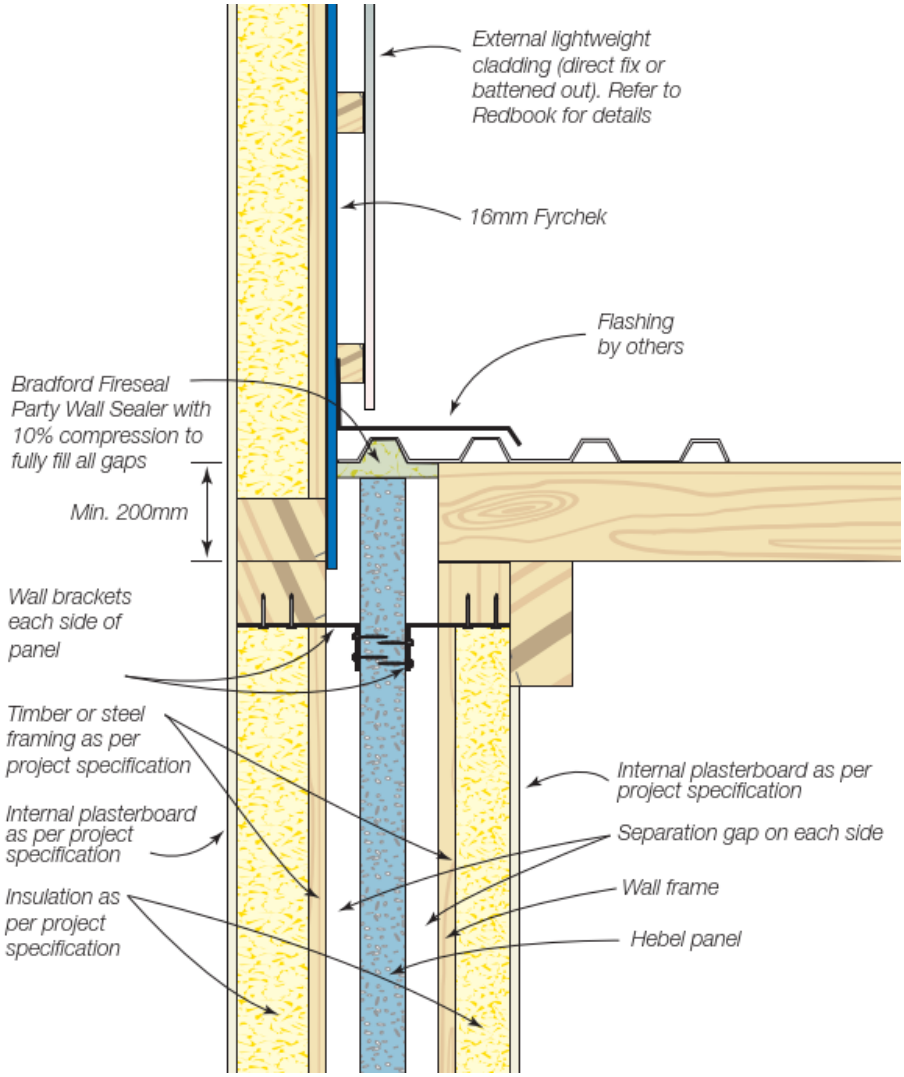


Figure 45 Hebel partywall to external wall detail at stepped roof – 2

4.3.28 Tapering horizontal Hebel panel within the roof space

It is proposed that the Hebel panels can be installed horizontally near the eaves, with a tapered top edge that is in line with the roof pitch. Two options are proposed. Option 1 and option 2 are shown in Figure 46 and Figure 47, respectively. For both options, care must be taken to ensure that the Hebel panels are not cracked – especially when cut to a taper of 50 mm or 0 mm. If the Hebel panels have cracked, they must not be used and be replaced.

In Option 1, the horizontal Hebel panel takes the form of a right trapezoid. It is fixed at the top and the bottom to the supporting frame on either side using aluminium angles – as shown in Figure 46. Its vertical edges are fixed to the adjacent panels using Hebel adhesive. Its bottom horizontal joint must be protected with CSR Fireseal sealant across the full thickness of the panel along its full length. The top edge must conform to the appropriate protection detailing adopted along the meeting edge of the Hebel panel and the roof.

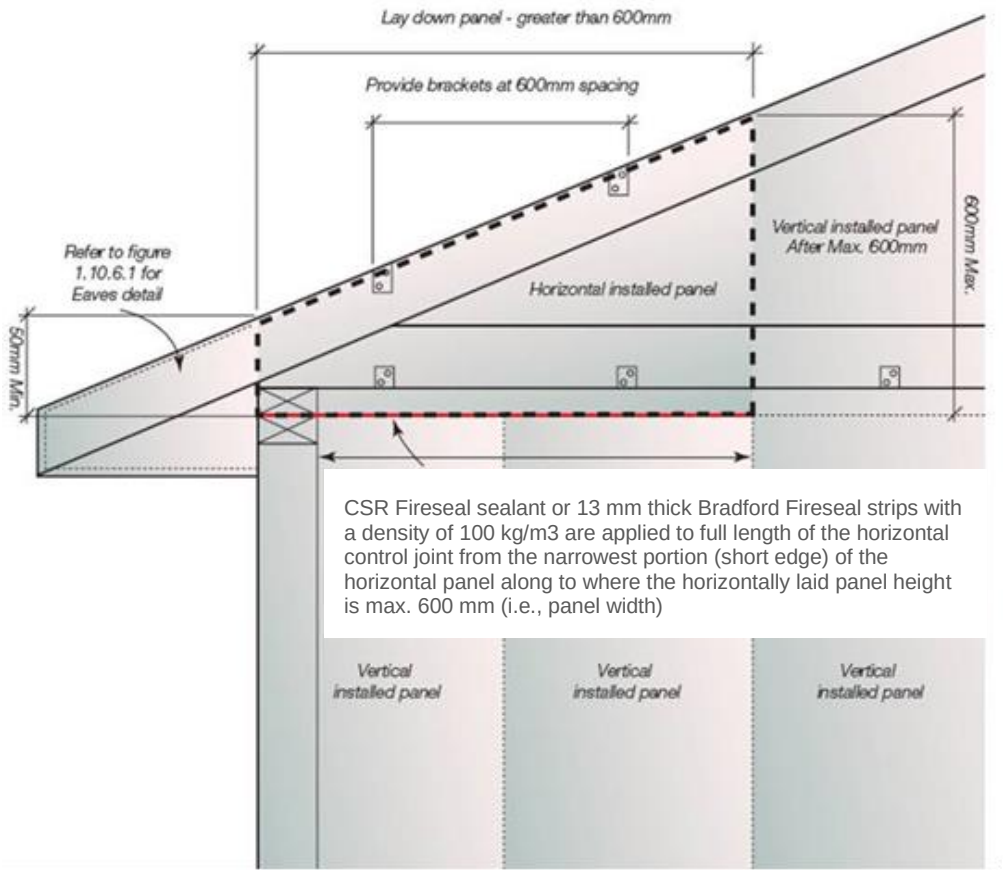


Figure 46 Tapering Hebel panel

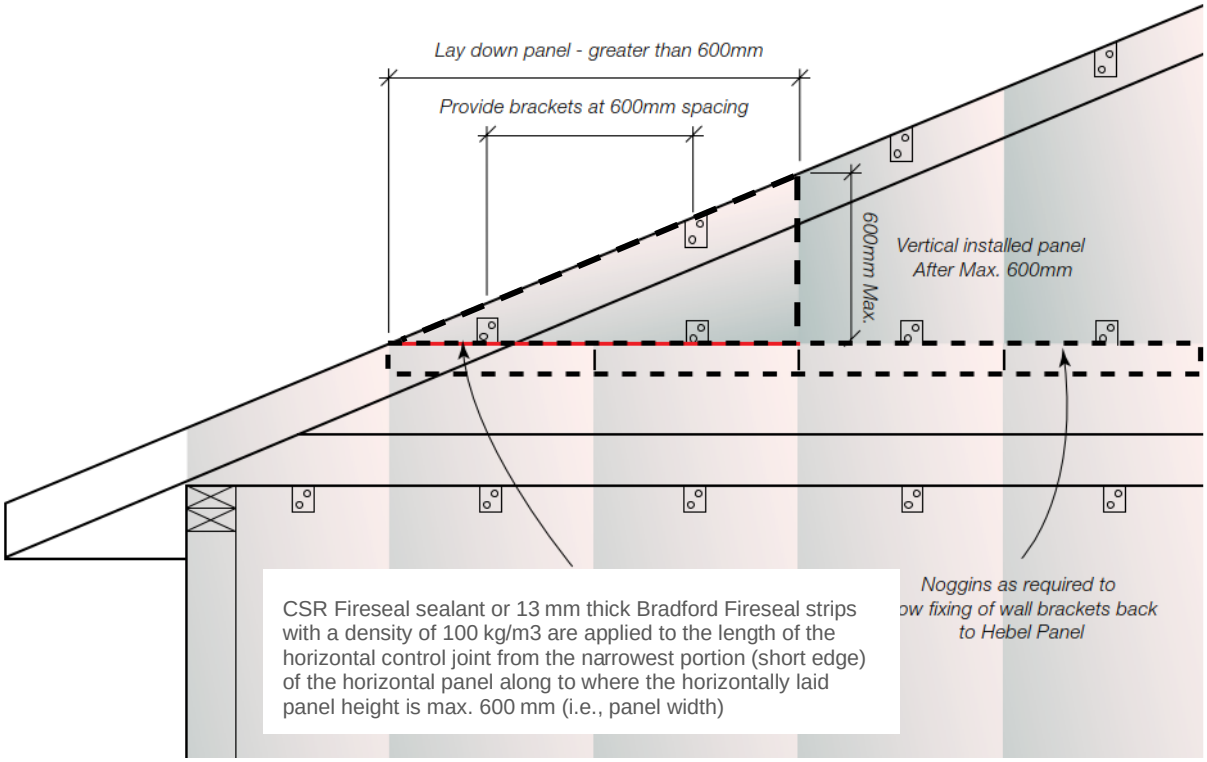


Figure 47 Hebel panel tapering to zero width at one edge

Option 2, shown in Figure 47, consists of a horizontally oriented triangular piece of Hebel panel that tapers to 0 mm. It is imperative that the tapered, 0 mm sharp edge of the Hebel panel remain

uncracked to ensure that the FRL is not compromised. If the Hebel panels have cracked, they must not be used and be replaced.

There is only one vertical edge, as the panel tapers to 0 mm on the opposite edge. This vertical edge abutting the adjacent vertical Hebel panel is glued using Hebel adhesive. The bottom edge is protected using CSR Fireseal sealant across the full thickness of the panel along its full length. Notably, Option 2 may require an additional steel or timber batten to laterally support the base of the tapering Hebel panel.

Timber noggins are inherently more rigid than steel noggins. In the case of steel noggins, it is noted that they need to be sufficiently rigid to be able to provide the lateral restraint to the base on the Hebel panel tapering to zero. Thus, the base metal thickness (BMT) of the noggin must be high. It is expected that a high BMT, such as 0.75 mm or higher, would potentially be adequate for this purpose. In any case, this detail must be designed and confirmed as fit for the required function by a structural engineer. Steel noggins with BMT lower than 0.75 mm must not be used.

It is proposed that the details shown in Figure 46 and Figure 47 are adequate to maintain an FRL of -/90/90 between the two tenancies. The proposed system is applicable to partywalls built using 50 mm or 75 mm Hebel AAC panels, provided that they are not cracked, and confirmation from the structural engineer has been obtained as described above.

4.4 Test and assessment standard

AS 1530.4:2014 outlines fire-resistance requirements for building materials and components. It does not provide specific guidelines for testing wall systems where external loads are applied to each side of a central core. In these situations, it's possible for the frame on the fire-exposed face to collapse without affecting the overall performance of the fire barrier system. This means that there are no clear instructions or criteria in the standard for evaluating the behaviour of such wall systems under fire exposure. As a result, other improved and modified testing and assessment methods that are based on AS 1530.4: 2014 are used to determine the fire resistance of these types of wall systems.

Applications where such a system is considered appropriate include common walls between dwellings where fire separation is required between dwellings. Such a system is deemed appropriate in these cases because the main focus of fire protection is to prevent the spread of fire between adjacent dwellings where the wall system provides the required level of fire separation, ensuring that the fire does not spread from one unit to another in the event of a fire.

Applications where such a system is not considered appropriate are where the timber frames provide support for other elements that are required to have a fire resistance, such as two or more storey class 2 or 3 buildings.

Based on the above, it is considered that the following criteria need to be applied to the CSR Hebel PowerPanel party wall system in order to comply with the intent of AS 1530.4:2014.

- Insulation criteria as applied to fire resistant walls and service penetrations in AS 1530.4:2014 in habitable areas and sub/floor and ceiling spaces.
- Integrity criteria as applied to fire resistant walls and service penetrations in AS 1530.4:2014 in habitable areas and sub/floor and ceiling spaces.
- Structural adequacy criteria – the structural frame on the non-fire exposed face should be capable of supporting the design load.
- A collapse of the structural frame on the fire exposed face must not cause the central PowerPanel core or joints to be breached or significantly degraded.
- Fixings between the non-fire side frame and the PowerPanel core should provide sufficient restraint to prevent collapse of the central membrane for the required fire resistance period for structural adequacy and integrity.
- In order to assess partitions greater than 3 m high, the PowerPanel membrane must be capable of supporting its self-weight plus the imposed weight of the panels above for the period required for structural adequacy and integrity.
- The proposed cantilever section of the wall will require examination and confirmation by other professional structural engineers, not part of the referenced assessment, that the section of the wall is structurally adequate and will not impose additional load on the vertical ground floor section over and above the loads originally allowed for a straight wall of up to 12 m or 16.5 m (for 75 mm Hebel panels) and 7.2 m (for 50 mm Hebel panels) high when exposed to flame on either side.

5. Conclusion

Details of the assessment and discussion are only available in the referenced main assessment report. A summary of the assessment outcome is outlined in Table 6 and Table 7.

Based on the discussion presented in the referenced assessment report, it has been concluded that the CSR Hebel PowerPanel party wall systems are expected to achieve the performance stated in Table 6 and Table 7 below in accordance with AS 1530.4:2014 as interpreted in the referenced assessment report in section 4.4, subject to the limitations and requirements in section 3. The variations assessed for the proposed systems are specified in section 4.3.

Table 6 Hebel Partywalls with 75 mm thick PowerPanel or PowerPanel^{XL}

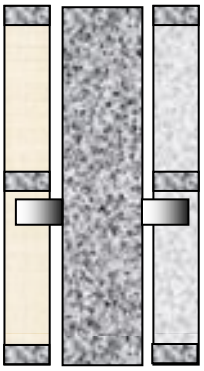
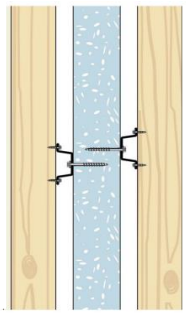
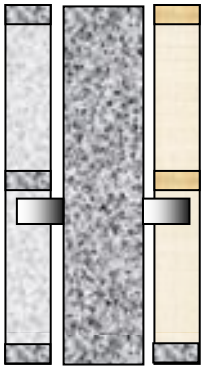
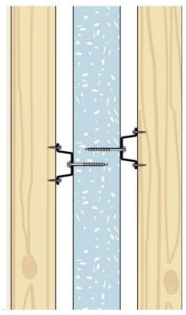
Description	Central core	Framing	Lining	Fixings	Outcome
	• 75 mm CSR Hebel PowerPanel (510kg/m^3) • 75 mm CSR Hebel PowerPanel^{XL} (400kg/m^3)	Loadbearing or non-loadbearing timber or steel framing	No lining required	Aluminum clips	12 m high (max) FRL 90/90/90 or FRL -/90/90 16.5 m high (max) FRL 60/60/60 or FRL -/60/60
		Loadbearing or non-loadbearing timber framing only		Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	
*Used in cantilevered wall systems only. Overall wall height would be lower than that prescribed in the outcome due to the absence of lower level floors.					

Table 7 Hebel Partywalls with 50 mm thick PowerPanel

Description	Central core	Framing	Lining	Fixings	Outcome
	50 mm CSR Hebel PowerPanel (510kg/m^3)	Loadbearing or non-loadbearing timber or steel framing	• As per section 4.3.4 • Wall lining may be omitted within the ceiling space only for ceiling heights up to 1.5 m	Aluminum clips	7.2 m high (max) FRL 90/90/90 or FRL -/90/90
		Loadbearing or non-loadbearing timber or steel framing	No lining required	Aluminum clips	7.2 m high (max) FRL 60/60/60 or FRL -/60/60
		Loadbearing or non-loadbearing timber framing only	• As per section 4.3.4 • Wall lining may be omitted within the ceiling space only for ceiling heights up to 1.5 m	Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	7.2 m high (max) FRL 90/90/90 or FRL -/90/90
		Loadbearing or non-loadbearing timber framing only	No lining required	Steel batten (24 mm Hebel Top hats) at 1200 mm centres*	7.2 m high (max) FRL 60/60/60 or FRL -/60/60

*Used in cantilevered wall systems only. Overall wall height would be lower than that prescribed in the outcome due to the absence of a ground floor wall.

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of the referenced assessment may be used to directly assess fire resistance, but it should be recognised that a single test method will not provide a full assessment of fire resistance 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 test data, information and experience available at the time of preparation. If contradictory evidence becomes available to the assessing authority, the assessment will be unconditionally withdrawn and the report sponsor will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

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 the referenced assessment report be reviewed on, or before, the stated expiry date.

The referenced assessment represents our opinion about the performance of the proposed systems expected to be demonstrated on a test in accordance with AS 1530.4:2014, based on the evidence referred to in the referenced assessment report.

The referenced assessment is provided to CSR Hebel for their own specific purposes. The referenced assessment report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in the referenced assessment report for a specific installation.

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