



ALLPROOF
I N D U S T R I E S

LEVEL THRESHOLD

Solutions for Doorways and Entrances

*Modern
systems
for modern
buildings.*



Contents

Perimeter Drain	3
Technical Details	4
Install Details	5
Cantilever Bracket (CB)	6
Install Details	7
Cast-In Cantilever Bracket (CCB)	8
Install Details	9
Bolted Bracket (BB)	10
Install Details	11
Threaded Leg (TL)	12
Install Details	13

Introduction

Solutions for Doorways and Entrances

The below is an extract from E2/AS1:

“The specific features of a building and its site can have a significant effect on the options available for providing level access at doors. These features include the provision of shelter, prevailing winds and ground levels. Where level access is required, it is highly recommended that the services of a designer experienced in this field be obtained.”

The simple aim is to stop rain getting into the dwelling. Regardless if the area in question is covered or not the same requirements remain as there is no specific mention of adequate cover that negates the requirement.

ALLPROOF is at the forefront of drainage solutions in New Zealand with a long history of leading the market, and the following is the most comprehensive systems available to the market which have been developed with the assistance of market leaders from the design and construction industry and with regulatory authority input.

While the systems developed in this document are accepted industry wide as complying to code, because projects can have their own unique features and challenges, Allproof encourages dialogue with project specific designers and regulatory authorities as well as the team at Allproof to ensure compliance.

Allproof Level
Threshold
Specifications
Available

masterspec partner

SMARTSPEC



Perimeter Drain

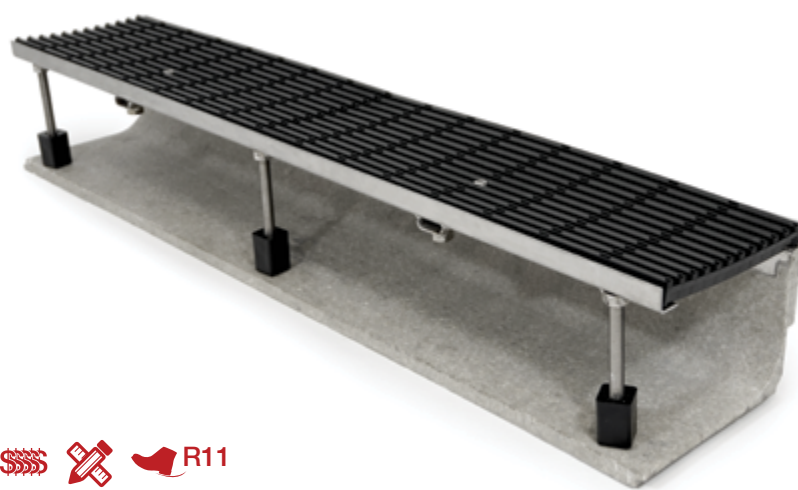


The Allproof Industries Perimeter Drain is an 'off the shelf' level threshold product that removes the process of boxing out and measuring. By simply butting the L shaped channel up against the exterior footing of the building it creates a surface to pour the concrete up against. The specially designed grate for this system is made from Glass Filled Nylon (GFN) and created in a way that it can be trimmed down on site to fit varying widths around the exterior of the building. Other grate options can be made available with custom manufacturing.

Channels come in a standard length of one metre. The standard GFN or HCI grate that comes with this system is supplied in 500mm lengths with stainless steel custom grate options available.

This system has been designed to be fast, efficient and cost effective due to reducing the need for custom manufacturing and providing a faster install process. This trouble free and easy to install product is the future of threshold drainage.

This system has been designed for pedestrian foot traffic with a load class rating of A.



Grate Options



Custom Made Wedge Wire (WW)**



Open Area: 47%
Standard Lengths: Custom
316 Stainless Steel



Custom Made Laser Cut Steel (LAS)**



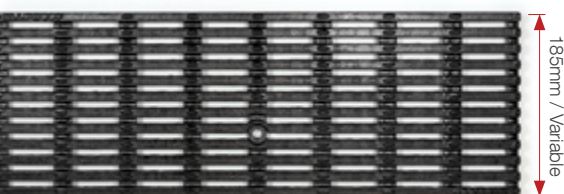
Open Area: 33%
Standard Lengths: Custom
316 / 304 Stainless Steel Option



Glass Filled Nylon (185GFN)*



Open Area: 29%
Standard Lengths: 500mm
Max Width: 185mm



Heelproof Cast Iron (185HCI)*



Open Area: 29%
Standard Lengths: 500mm
Max Width: 185mm

*Note Cast Iron Grates supplied painted black. Oxidisation can occur naturally, is aesthetic, and will not impact on grate performance.
Powder coating optional extra for improved coating quality.

* Comes in 500mm lengths, onsite adjustable width up to 185mm and length.
** Custom widths and lengths available.

AS4586 Slip
Resistance Classification:

Price Guide:

Heelproof:

Customisable
Width & Length:



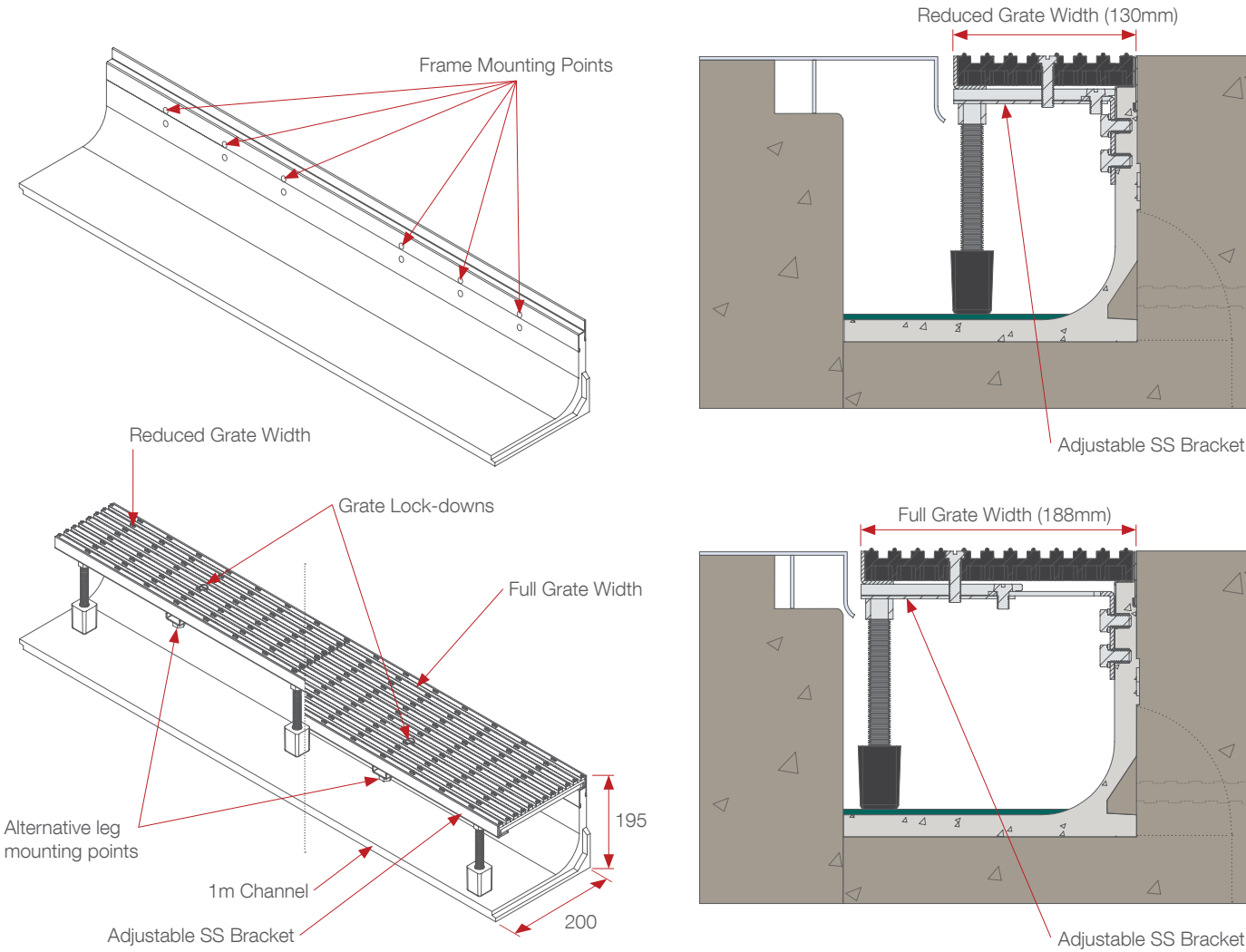
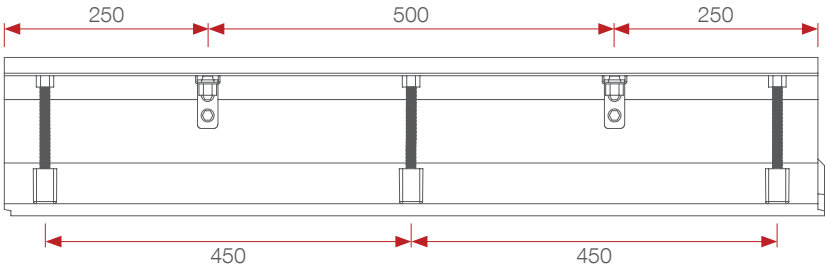
Technical Details & Codes

(PC180L)



Product Order Codes:

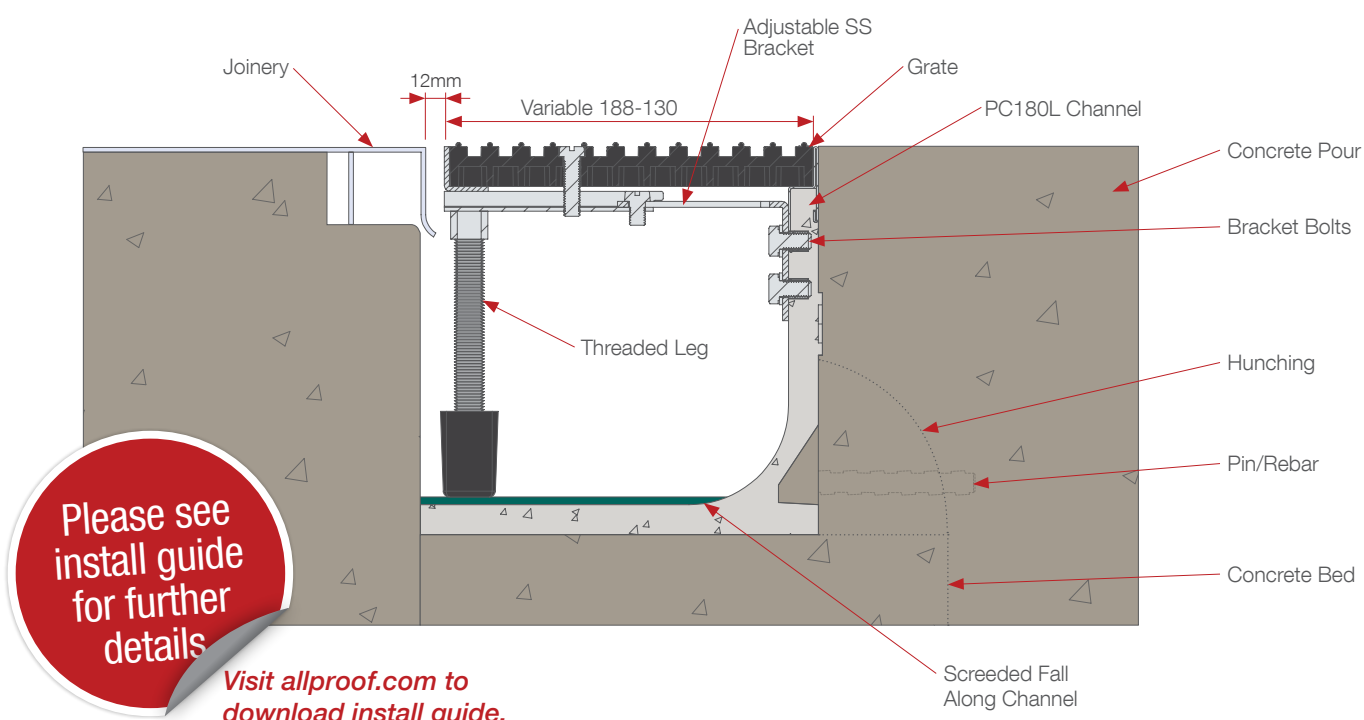
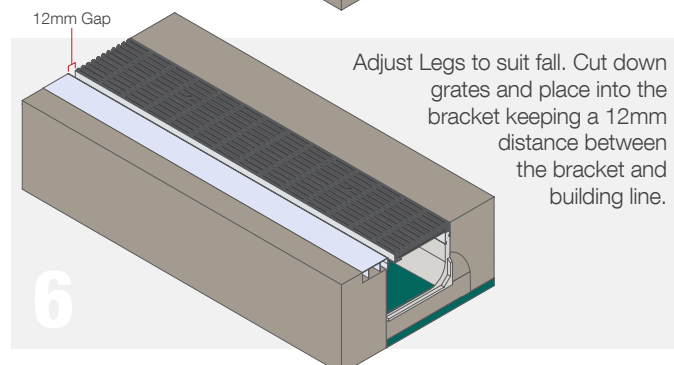
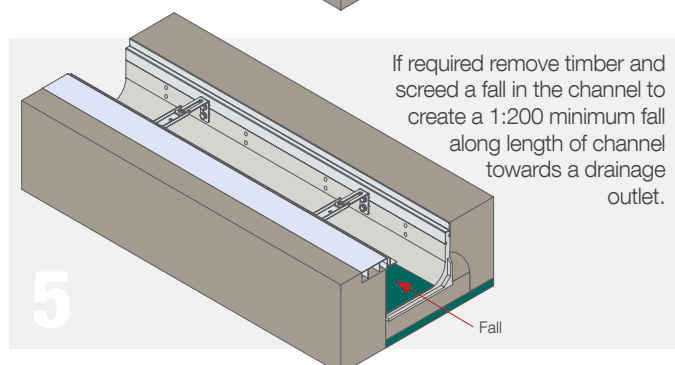
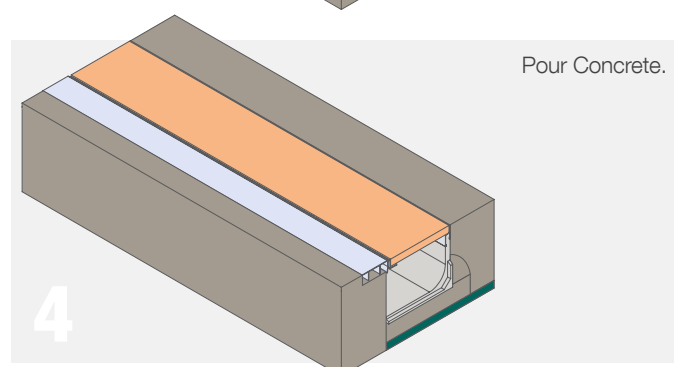
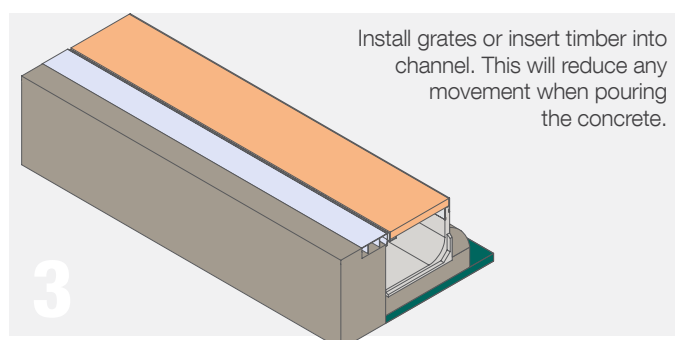
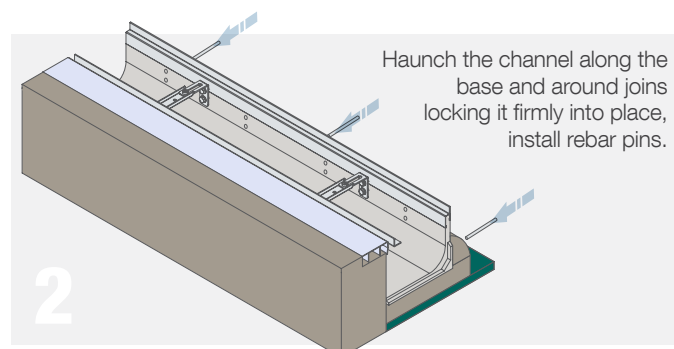
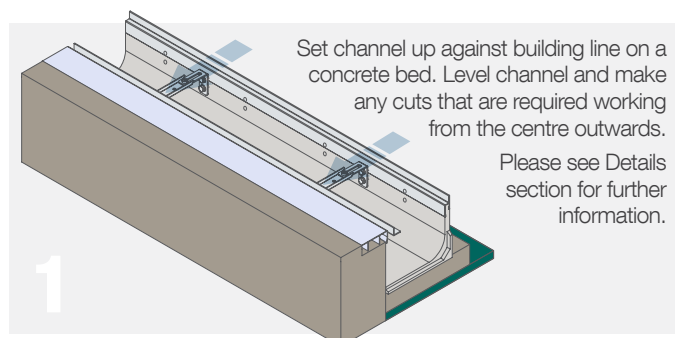
Code	Description
Standard Off The Shelf System and Grates	
PC180LGFN	1 metre length of Perimeter Drain with Glass Filled Nylon Grate
PC180LHCI	1 metre length of Perimeter Drain with Heelproof Cast Iron Grate
PC180LEC SS	Stainless Steel Perimeter Drain End Cap
System With Custom Grates (for specification purposes)	
PC180LWW CUS	1 metre length of Perimeter Drain with Wedge Wire Grate
PC180LLAS CUS	1 metre length of Perimeter Drain with Laser Cut Steel Grate





Install Details

(PC180L)





Cantilever Bracket (CB)



Suitable for tile/paver finish. The Cantilever Bracket system is a design that can be used when a permanent mounting option is desired. The bracket is bolted onto the slab before the finishing surface is installed.

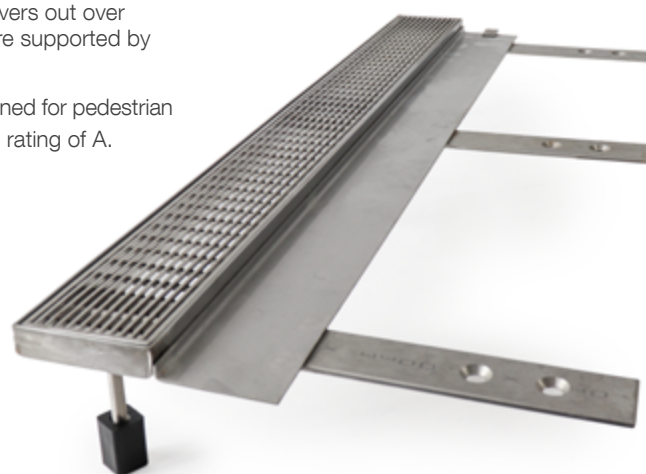
This fixing system also means a spacer is not required to maintain the 12mm distance and the bracket and joinery remain mechanically separated at all times.

This system is fully customisable and also provides an opportunity to create an E2 compliant channel with a narrower reveal by extending the tiles or pavers out over the channel. Tiles/pavers are supported by a continuous support bar.

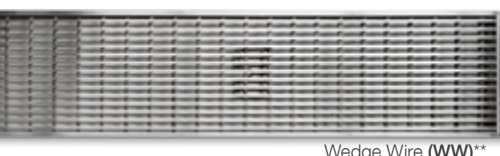
This system has been designed for pedestrian foot traffic with a load class rating of A.

Specification Codes:

Code	Description
CBWW	Cantilever Bracket with Wedge Wire Grate
CBLAS	Cantilever Bracket with Laser Cut Steel Grate
CBGFN	Cantilever Bracket with GFN Grate
CBTI	Cantilever Bracket with Tile Insert Grate



Grate Options



Wedge Wire (WW)**



Open Area: 47%
Standard Lengths: Custom
316 Stainless Steel



Laser Cut Steel (LAS)**



Open Area: 33%
Standard Lengths: Custom
316 / 304 Stainless Steel Option



Glass Filled Nylon (185GFN)*



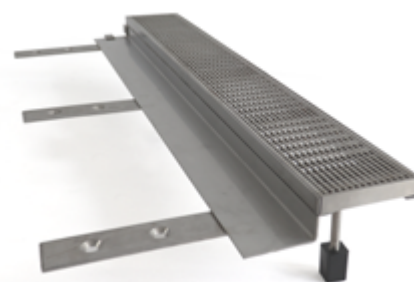
Open Area: 29%
Standard Lengths: 500mm
Max Width: 185mm



Tile Insert (TI)**



Open Area: 10%
Standard Lengths: Custom
304 Stainless Steel Option



Please note design may vary to accommodate tile/paver depths in relation to grate depths once slab set down height reaches a distance greater than 48mm (see detail opposite). This variance in design does not affect the install process, performance or final aesthetics of the product and install.

** Custom widths and lengths available.

AS4586 Slip
Resistance Classification:

Price Guide:

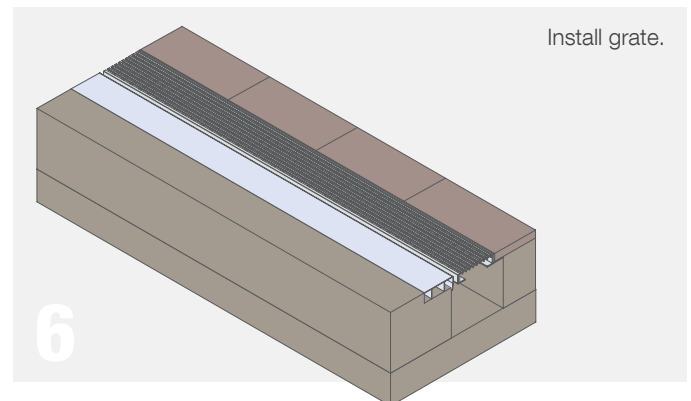
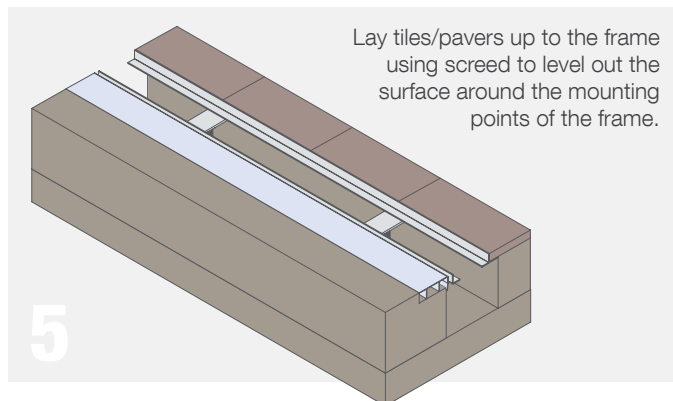
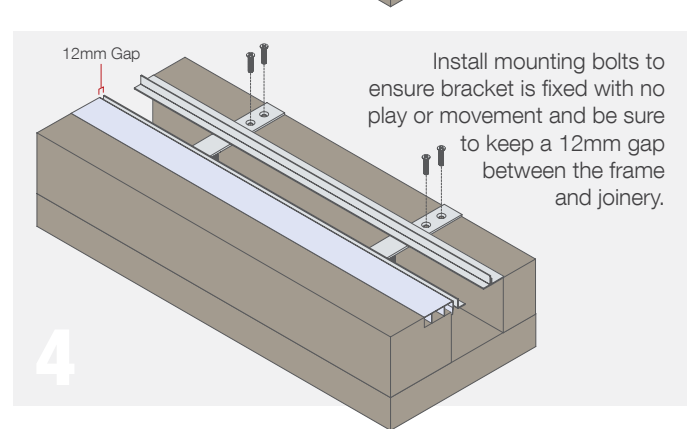
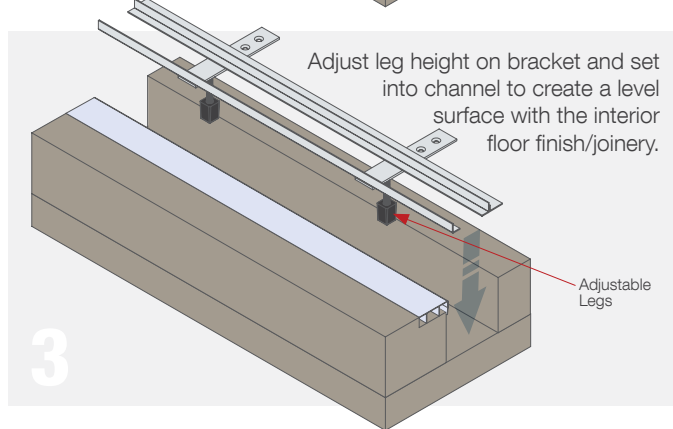
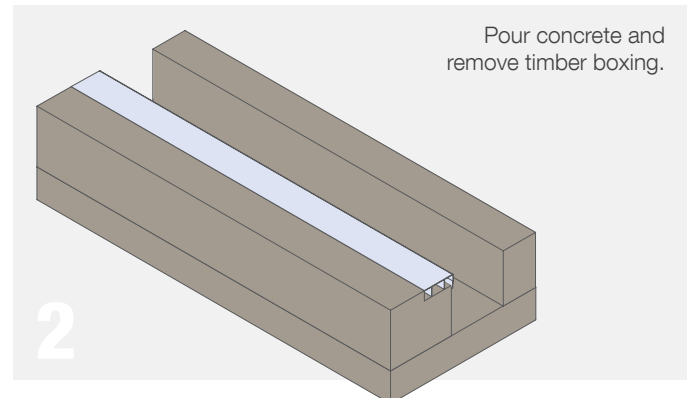
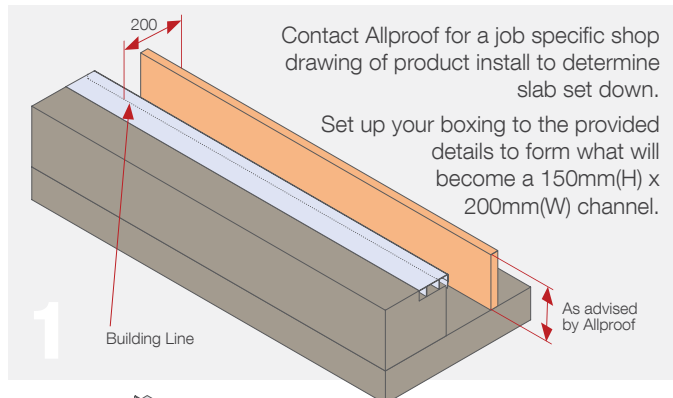
Heelproof:

Customisable
Width & Length:



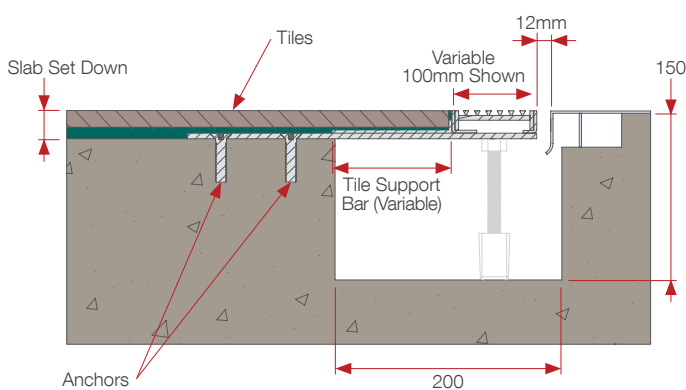
Install Details

(CB)



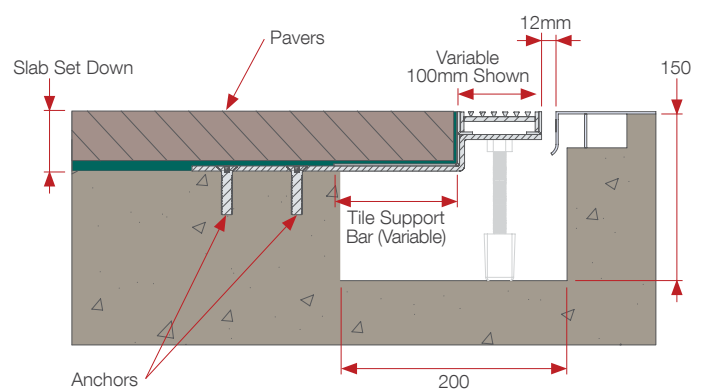
Tile Depth

Slab set downs 28-47mm for stainless grates.



Paver Depth

Slab set downs 48mm+, also applicable for GFN on any slab set down greater than 28mm.





Cast-In Cantilever Bracket (CICB)



Suitable for concrete finish. The Cast-In Cantilever Bracket system is a design that can be used when a permanent mounting option is desired. The bracket is cast into the slab before the finishing surface is poured.

This system utilises standard off the shelf width grates making it possible to keep unity and consistency between differing drainage systems within one project. Therefore the Cast-In Cantilever Bracket has a fixed grate width of 123mm.

This system requires two pours of concrete, the first providing a platform for the bracket to be affixed to, the second pour provides the finished surface and cantilevered grating.

This system has been designed for pedestrian foot traffic with a load class rating of A.

Specification Codes:

Code	Description
CICB125WW	Cast-In Cantilever Bracket with Wedge Wire Grate
CICB125LAS	Cast-In Cantilever Bracket with Laser Cut Steel Grate
CICB125SS	Cast-In Cantilever Bracket with Pressed Stainless Grate
CICB125GFN	Cast-In Cantilever Bracket with Glass Filled Nylon Grate
CICB125HCI	Cast-In Cantilever Bracket with Heelproof Cast Iron Grate

Grate Options



Wedge Wire (WW)

R11
 Open Area: 47%
 Standard Lengths: 1000mm
 316 Stainless Steel



Laser Cut Steel (LAS)

Open Area: 33%
 Standard Lengths: 1000mm
 316 / 304 Stainless Steel Option



Glass Filled Nylon (GFN)

Open Area: 28%
 Standard Lengths: 500mm



Pressed Stainless (SS)

Open Area: 30%
 Standard Lengths: 1000mm



*Cast Iron, Heelproof (HCI)

Open Area: 31%
 Standard Lengths: 500mm

*Note Cast Iron Grates supplied painted black. Oxidisation can occur naturally, is aesthetic, and will not impact on grate performance.
 Powder coating optional extra for improved coating quality.



AS4586 Slip
Resistance Classification:

Price Guide:

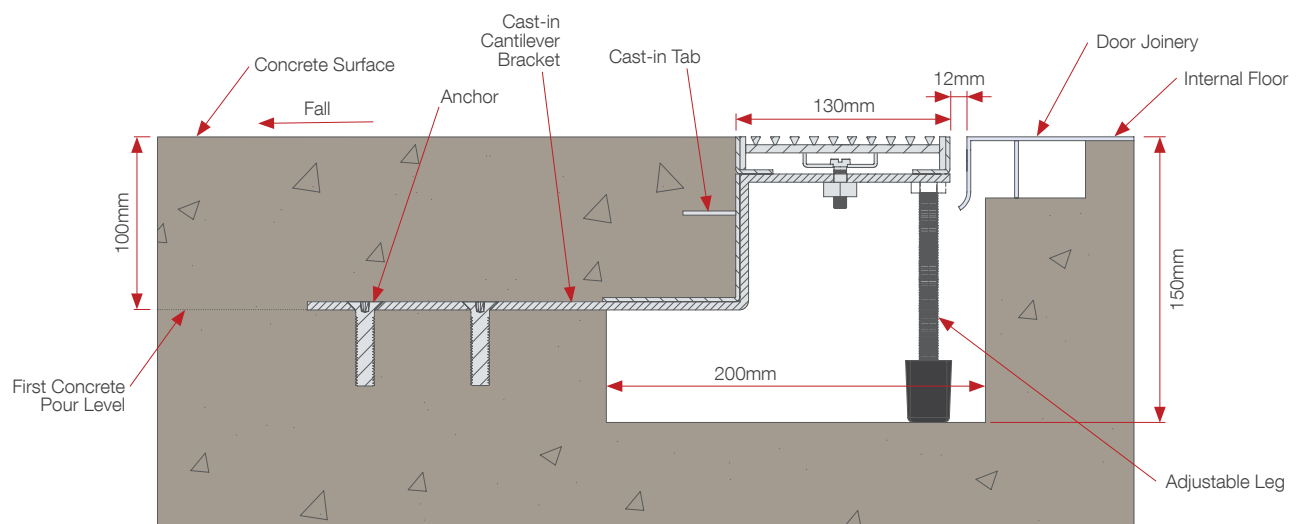
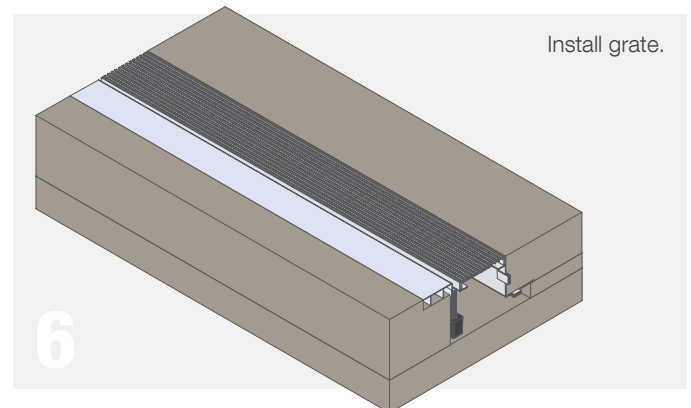
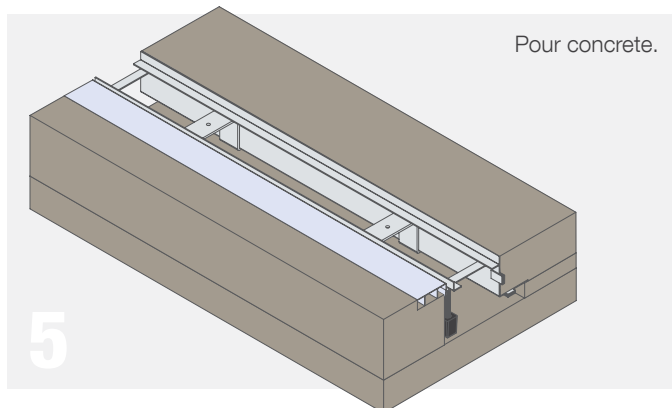
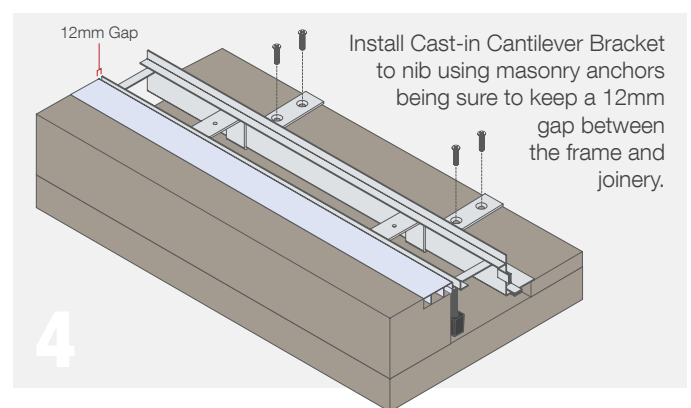
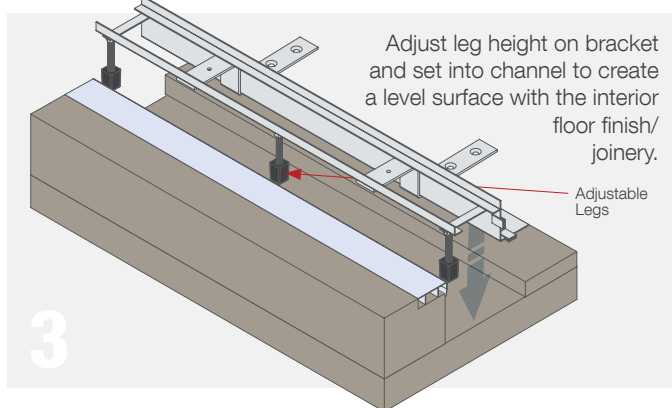
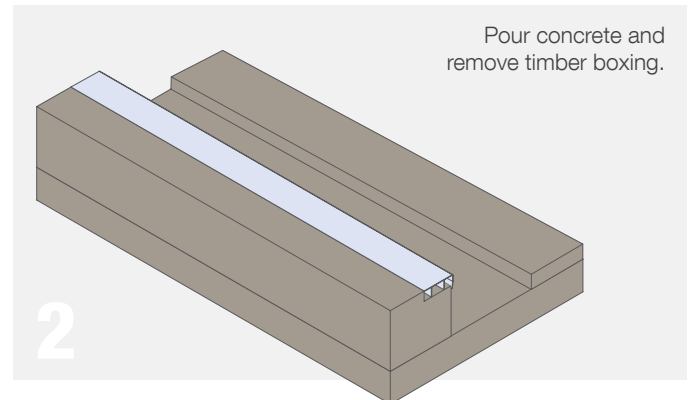
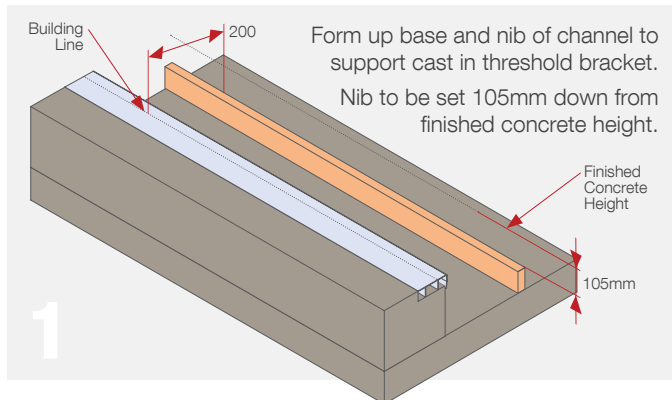
Heelproof:

Customisable
Width & Length:



Install Details

(CCB)





Bolted Bracket (BB)



Allproof's Bolted Bracket level threshold system incorporates mounted bolting points in the external slab for stability, a bracket, grate and height adjustable threaded legs.

The frame is custom made for each specific job to ensure a perfect fit around the threshold of your project. The differing grate widths around joinery will all be accounted for in this process.

When setting out for a concrete pour construction anchors will be fitted into the boxing and left protruding into the formed channel when boxing is removed.

This allows the "bolted bracket frame" to drop in onto and be fastened to the bolts at a later stage. This removes the requirement of the system to be on site until later in the construction schedule, removing pressure around time of pour.

This system has been designed for pedestrian foot traffic with a load class rating of A.

Specification Codes:

Code	Description
BBWW	Bolted Bracket with Wedge Wire Grate
BBLAS	Bolted Bracket with Laser Cut Steel Grate
BBGFN	Bolted Bracket with Glass Filled Nylon Grate
BBHCI	Bolted Bracket with Heelproof Cast Iron Grate



Grate Options



Custom Made Wedge Wire (WW)**

Variable



Open Area: 47%
Standard Lengths: Custom
316 Stainless Steel



Laser Cut Steel (LAS)**

Variable



Open Area: 33%
Standard Lengths: Custom
316 / 304 Stainless Steel Option



Glass Filled Nylon (185GFN)*

185mm / Variable



Open Area: 29%
Standard Lengths: 500mm
Max Width: 185mm



Heelproof Cast Iron (185HCI)*

185mm / Variable



Open Area: 29%
Standard Lengths: 500mm
Max Width: 185mm

*Note Cast Iron Grates supplied painted black. Oxidisation can occur naturally, is aesthetic, and will not impact on grate performance.

Powder coating optional extra for improved coating quality.

* Comes in 500mm lengths, onsite adjustable width up to 185mm and length.

** Custom widths and lengths available.

AS4586 Slip Resistance Classification:

Price Guide:

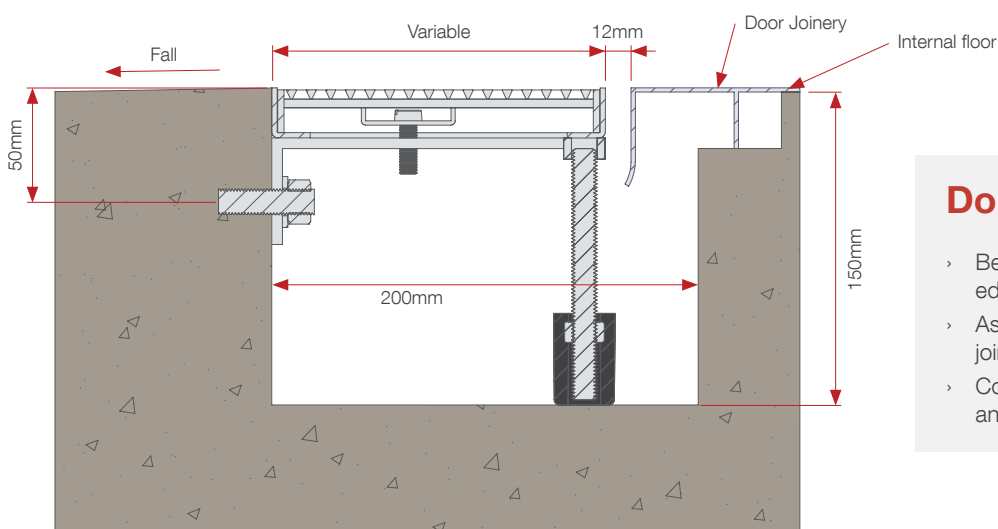
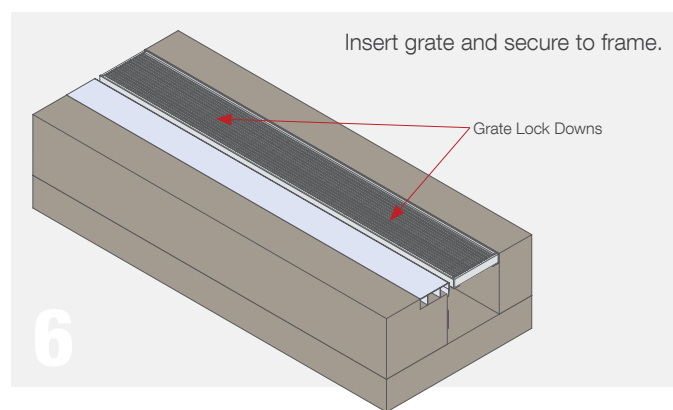
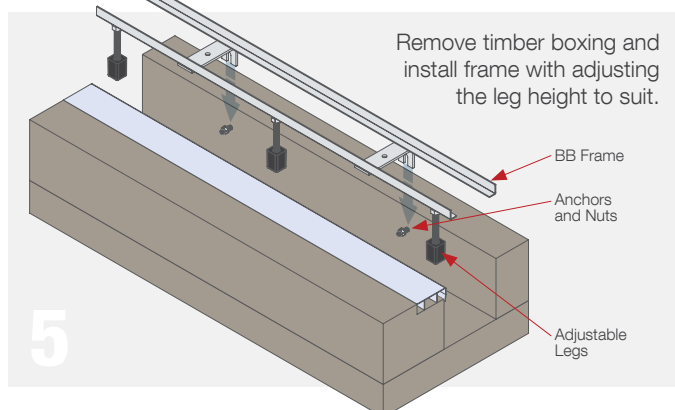
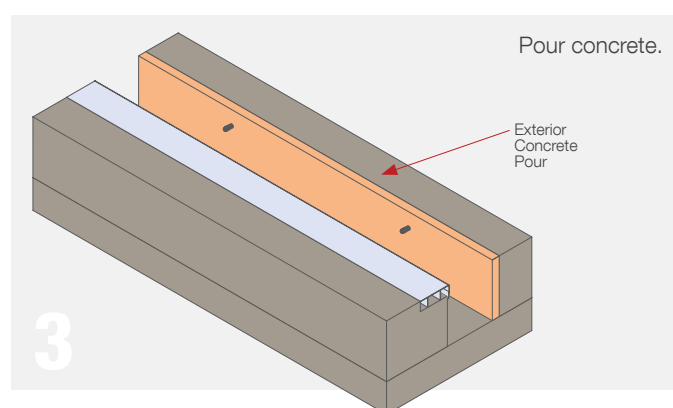
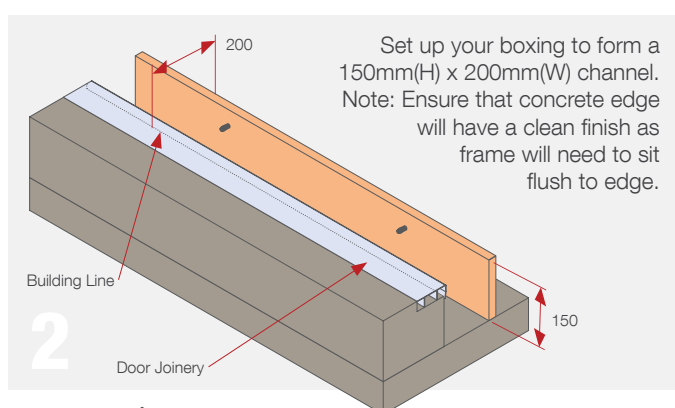
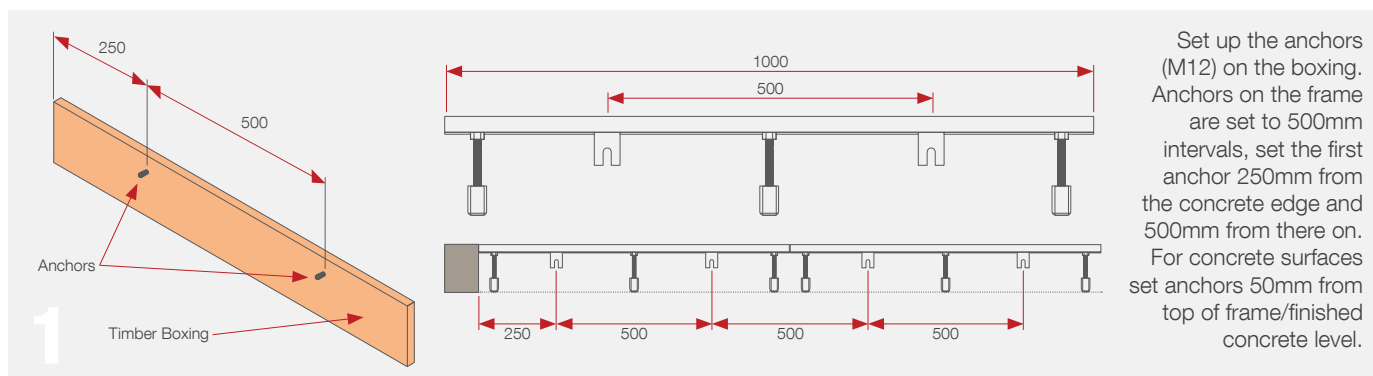
Heelproof:

Customisable Width & Length:



Install Details

(BB)



Do's and Don'ts

- Be sure to get straight clean finished edges to concrete.
- As standard this system uses butt joints for corners, **not** mitred.
- Contact the Allproof team if you have any queries.



Threaded Leg (TL)



The Threaded Leg system is a fully customised solutions featuring adjustable rods with plastic feet that allow the installer to match any undulations in the formed channel with ease. A plastic spacer is used to maintain the required 12mm distance from the joinery. The Threaded Leg is a simple, but elegant solution to level threshold requirements.

This system has been designed for pedestrian foot traffic with a load class rating of A.

Specification Codes:

Code	Description
TLWW	Threaded Leg with Wedge Wire Grate
TLLAS	Threaded Leg with Laser Cut Steel Grate

Grate Options



Wedge Wire (WW)**

R11
Open Area: 47%
Standard Lengths: Custom
316 Stainless Steel



Laser Cut Steel (LAS)**

Open Area: 33%
Standard Lengths: Custom
316 / 304 Stainless Steel Option

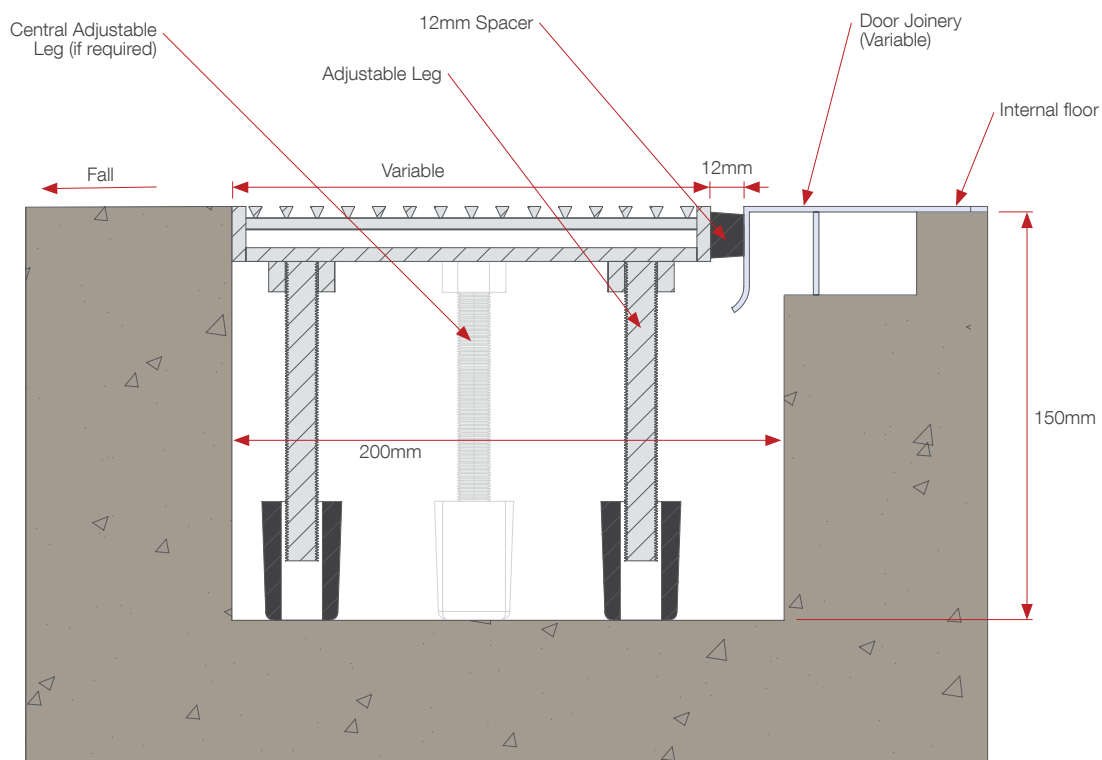
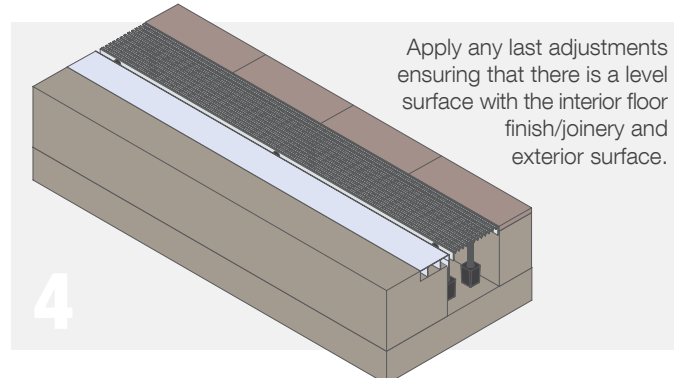
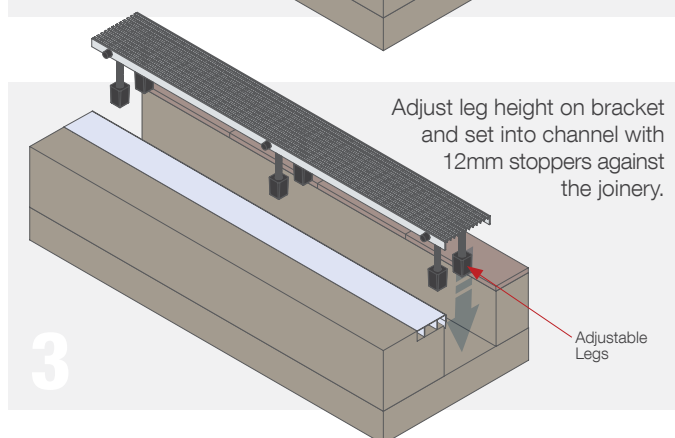
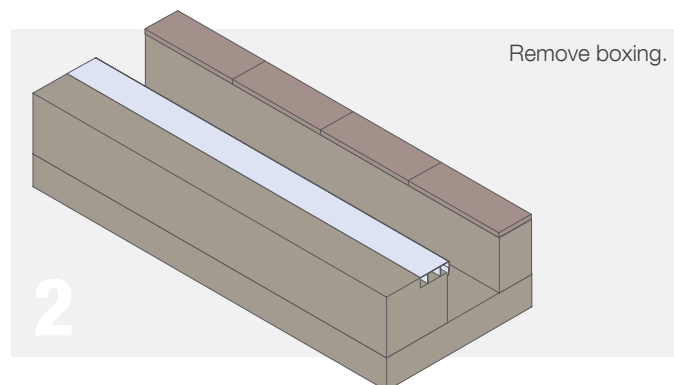
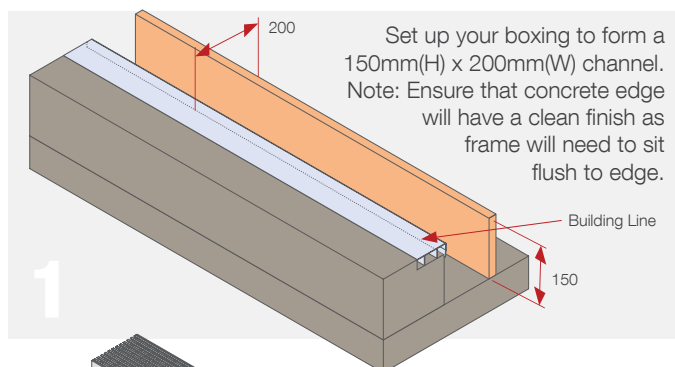


** Custom widths and lengths available.

AS4586 Slip Resistance Classification:	Price Guide:	Heelproof:	Customisable Width & Length:
--	--------------	------------	------------------------------



Install Details





Level Threshold -

Most widely understood as the term describing an entrance to a building where the external surface level remains the same as the internal finished floor level.

Pictured: *Perimeter Drain with wedge wire grate.*



ALLPROOF
INDUSTRIES



LEVEL THRESHOLD

Solutions for Doorways and Entrances

Also see our Polymer Concrete brochure and Domestic range for further exterior drainage products by Allproof to keep your project consistent.



ALLPROOF
INDUSTRIES

17 Bay Park Place
Beach Haven
PO Box 340-265
Birkenhead, Auckland
New Zealand

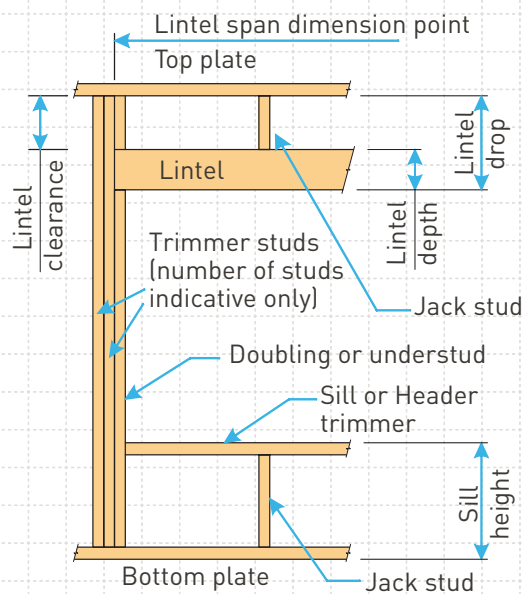
ALL0009.05



STUDLOK™ LINTEL FIXING OPTIONS FOR ON-SITE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

- All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20kPa
- These fixings assume the correct choice of rafter/truss to top plate connections have been made
- All fixings assume bottom plate thickness of 45mm maximum
- Wall framing arrangements under girder trusses are not covered in this schedule
- All timber selections are as per NZS 3604:2011



LINTEL SUPPORTING GIRDER TRUSSES

Roof Tributary Area	Light Roof			Heavy Roof		
	Wind Zone			Wind Zone		
	Low, Medium, High	Very High	Extra High	Low, Medium, High	Very High	Extra High
8.6m ²	G	G	H	G	G	H
11.6m ²	G	H	H	G	G	H
12.1m ²	G	H	H	G	H	H
15.3m ²	H	H	-	G	H	H
19.1m ²	H	-	-	G	H	-
20.9m ²	H	-	-	H	H	-
21.8m ²	H	-	-	H	-	-
34.3m ²	-	-	-	H	-	-

NOTES:

1. Roof Tributary Area = approx. 1/2 x (total roof area on girder and rafter trusses supported by lintel)
2. Assumed girder truss is at mid-span or middle third span of lintel
3. Use similar fixings for both ends of lintel
4. All other cases require specific engineering design





STUDLOK™ LINTEL FIXING OPTIONS FOR ON-SITE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

Lintel Span (m)	Loaded Dimension (m)	Light Roof					Heavy Roof				
		Wind Zone					Wind Zone				
		Low	Medium	High	Very High	Extra High	Low	Medium	High	Very High	Extra High
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	F	F	G	G	H	E	E	F	G	G
1.5	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	F	F	G	G	H	E	E	F	G	G
	6.0	F	F	G	H	H	E	E	F	G	H
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	F	F	G	G	E	E	F	F	G
	4.0	F	F	G	G	H	E	E	F	G	G
	5.0	F	F	G	H	H	E	E	F	G	H
	6.0	F	G	G	H	H	E	F	G	H	H
2.4	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	G	G
	4.0	F	F	G	H	H	E	E	F	G	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	H	H	-	E	F	G	H	H
3.0	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	H	H	E	E	F	G	H
	4.0	F	G	G	H	H	E	F	G	H	H
	5.0	F	G	H	H	-	E	F	G	H	H
	6.0	F	G	H	-	-	E	F	G	H	-
3.6	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	F	G	H	H	E	F	G	G	H
	4.0	F	G	H	H	-	E	F	G	H	H
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	H	-	-
4.2	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	H	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.5	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.4	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
4.8	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.2	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	H	H	E	E	F	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	H	H	E	E	F	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-



STUDLOK™ LINTEL FIXING OPTIONS FOR ON-SITE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

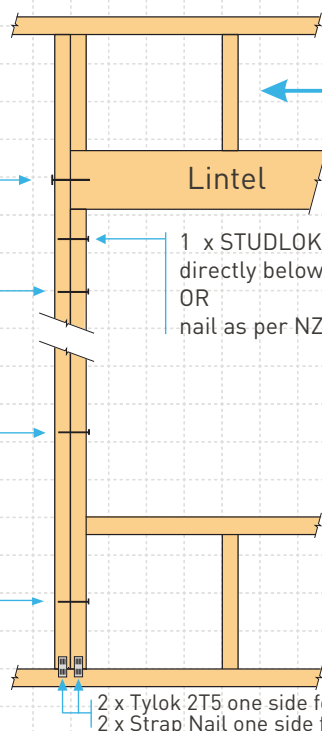
TYPE F 4.0kN

For Lintel 140mm min.
2 x STUDLOK SL125
(green)

Refer Detail 1 for
90mm Stud
Refer Detail 2 for
140mm Stud

STUDLOK SL80
(white)

Trimmer to
understud at
400mm crs.
OR
nail as per
NZS 3604:2011



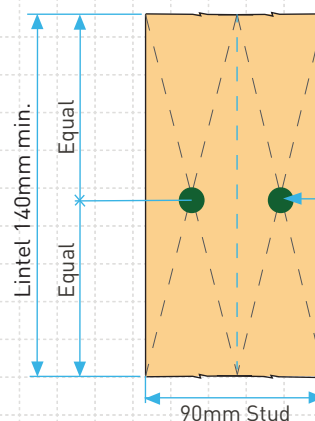
For fixing of jack studs
refer to Jack Stud to
Top Plate & Lintel
Fixing brochure

1 x STUDLOK SL80 (white)
directly below lintel
OR
nail as per NZS 3604:2011

Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

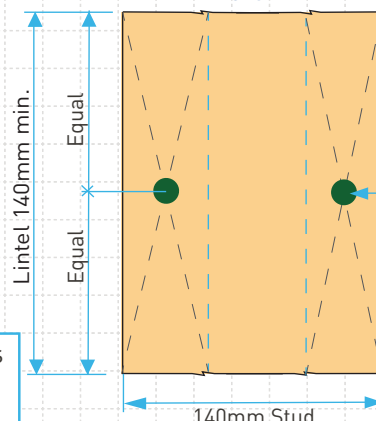
2 x Tylok 2T5 one side for Radiata Pine OR
2 x Strap Nail one side for Douglas Fir

Detail 1



STUDLOK
SL125 (green)

Detail 2



STUDLOK
SL125 (green)

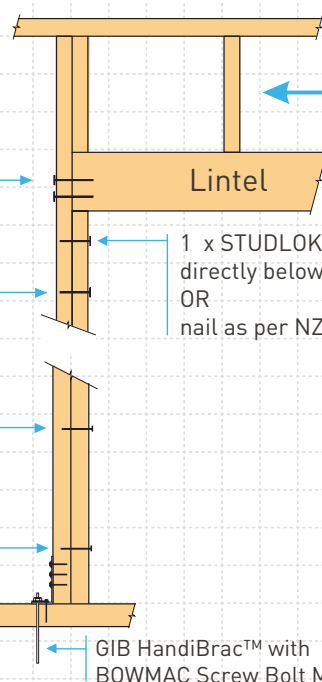
TYPE G 7.5kN

For Lintel 140mm min.
4 x STUDLOK SL125
(green)

Refer Detail 3 for
90mm Stud
Refer Detail 4 for
140mm Stud

STUDLOK SL80
(white)

Trimmer to
understud at
400mm crs.
OR
nail as per
NZS 3604:2011



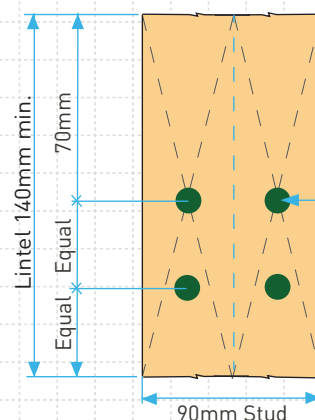
For fixing of jack studs
refer to Jack Stud to
Top Plate & Lintel
Fixing brochure

1 x STUDLOK SL80 (white)
directly below lintel
OR
nail as per NZS 3604:2011

Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

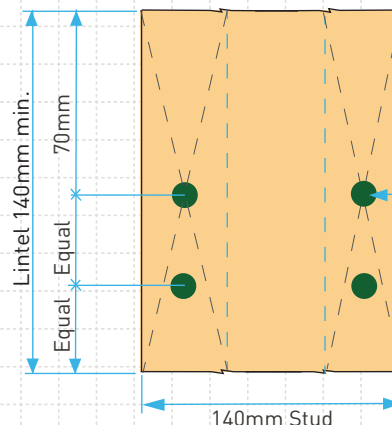
GIB HandiBrac™ with
BOWMAC Screw Bolt M10 x 140mm

Detail 3



STUDLOK
SL125 (green)

Detail 4

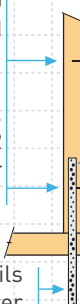


STUDLOK
SL125 (green)

OR

STUDLOK SL80
(white)

Trimmer to
understud at
400mm crs.
OR
nail as per
NZS 3604:2011



400mm Sheet Brace Strap to one side
6 x 30mm x 3.15 dia. nails to stud

3 x 30mm x 3.15 dia. nails to
bottom plate

6 x 30mm x 3.15 dia. nails
to timber joist/bearer

MiTek



STUDLOK™ LINTEL FIXING OPTIONS FOR ON-SITE

ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

TYPE H 13.5kN

For Lintel 190mm min.
6 x STUDLOK SL170
(blue)

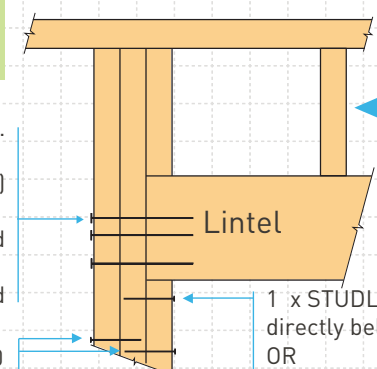
Refer Detail 5 for
90mm Stud

Refer Detail 6 for
140mm Stud

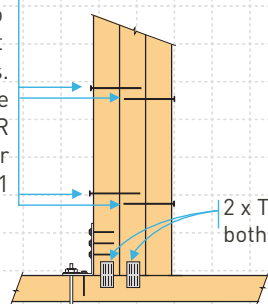
STUDLOK SL80
(white)

Trimmer to
understud at
400mm crs.
both side

OR
nail as per
NZS 3604:2011



1 x STUDLOK SL80 (white)
directly below lintel
OR
nail as per NZS 3604:2011

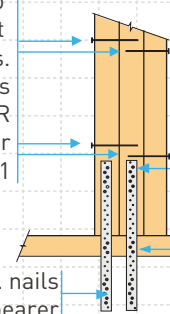


OR

STUDLOK SL80
(white)

Trimmer to
understud at
400mm crs.
both sides

OR
nail as per
NZS 3604:2011

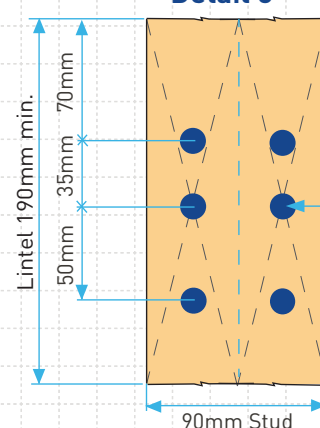


6 x 30mm x 3.15 dia. nails
timber joist/bearer

2 x 400mm Sheet Brace Straps to one side
6 x 30mm x 3.15 dia. nails to stud

3 x 30mm x 3.15 dia. nails to
bottom plate

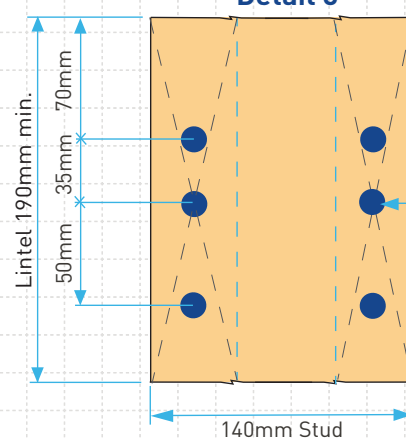
Detail 5



STUDLOK
SL170
(blue)

Stud numbers
indicative only.
Refer Table 8.5
NZS 3604:2011

Detail 6



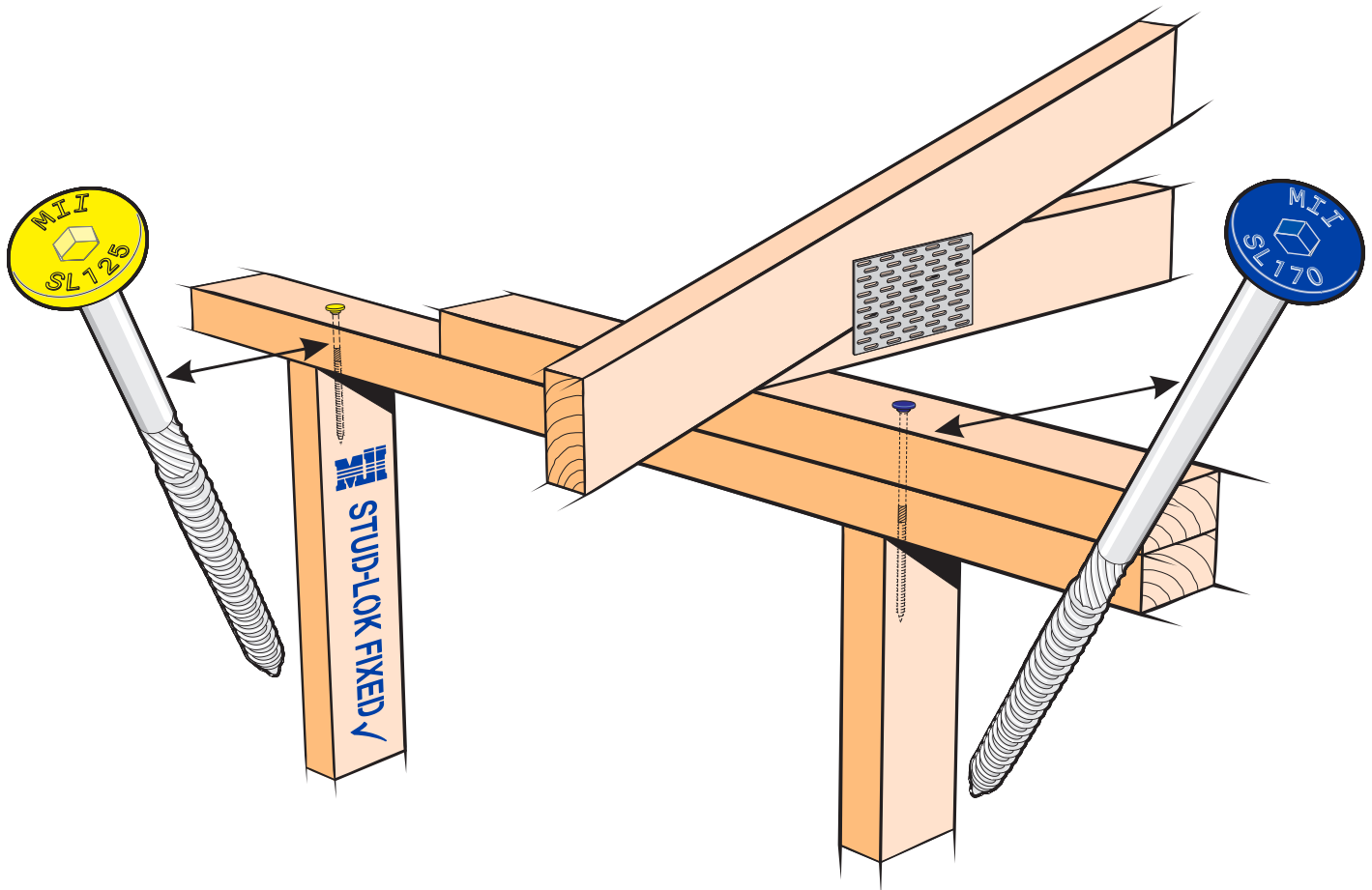
STUDLOK
SL170
(blue)

NOTE: STUDLOK TYPE F 4.0 kN fixing can be used for TYPE E 1.4 kN fixing



STUD-LOK

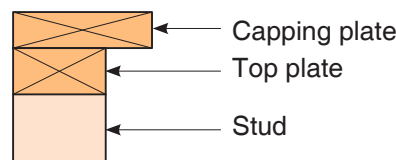
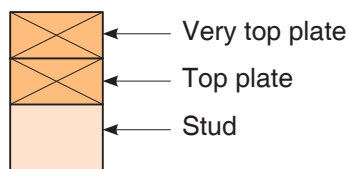
Provides a solution for top plate to stud fixings for residential timber frame buildings



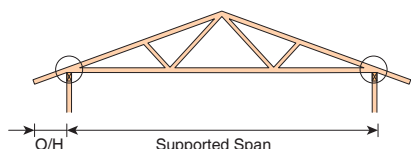
- ★ Complies with fixing requirements in Section 8 NZS 3604:2011
- ★ The BOWMAC® STUD-LOK forms an integral part of the MiTek Truss & Frame design and layout
- ★ Available in 2 lengths allowing for connections from stud to single top plate (SL125) and stud to double top plates (SL170)
- ★ Applied in the factory
- ★ Is a completely internal connection avoiding any clashes with wall linings

- NOTE:** ★ The STUD-LOK fixing is designed to resist vertical loads only.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ The STUD-LOK connections assume that the correct choice of rafter/truss fixings have been made.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011 and include LVL8 timber grades.

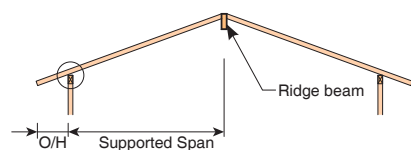
DOUBLE TOP PLATES DEFINITION



LOAD DIMENSION DEFINITION

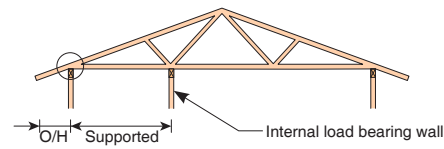


External wall with
Standard truss

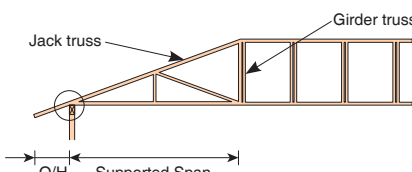


External wall with
Rafter roof

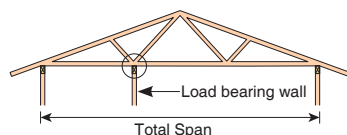
$$\text{EXTERNAL WALL LOADED DIMENSION} = \frac{\text{SUPPORTED SPAN}}{2} + \text{O/H}$$



External wall with
Internal load bearing wall

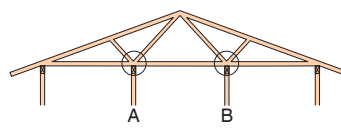


External wall with
Jack truss



Internal load bearing wall
(overhang dimension does not apply)

$$\text{INTERNAL LOAD BEARING WALL LOADED DIMENSION} = \frac{\text{TOTAL SPAN}}{2}$$



Multiple internal load bearing walls
(overhang dimension does not apply)

$$\begin{aligned} \text{MULTIPLE INTERNAL LOAD BEARING WALLS LOADED DIMENSION FOR} \\ \text{WALL A} &= a/2 \\ \text{WALL B} &= b/2 \end{aligned}$$

FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

Wind Zones L, M, H, VH, EH as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
4.0	3.0	2.0	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
5.0	3.8	2.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
6.0	4.5	3.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
7.0	5.3	3.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
8.0	6.0	4.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
9.0	6.8	4.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
10.0	7.5	5.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
11.0	8.3	5.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
12.0	9.0	6.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL

2N = 2/ 90mm x 3.15 dia. nails

SL = Single STUD-LOK
plus 2/ 90mm x 3.15 dia. nails

NOTE:

To calculate the number of STUD-LOK fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.



TECHNICAL INFORMATION – CLEANSTREAM TXR-1

The Cleanstream TXR-1 is a complete, one tank textile media treatment system. Its multi-chambered design consists of 2 septic stages, a textile filter stage and irrigation and recirculation stages.

- 8400 litre total capacity
- Emergency storage (without cross contamination - 3500 litres)
- Alarm system (to notify the homeowner of any faults)
- Comprehensive maintenance by Duracrete



- The TXR-1 tank, roof and walls are constructed from galvanised, steel reinforced concrete (70MPa at 28 days) and come with a manufacturer's warranty of 10 years from the day they leave the factory. The mechanical components of the system (pumps) also come with a 2 year warranty from the date of commission. Electrical components come with a 1 year manufacturers warranty.
- The textile filter and recirculation stages are designed so that effluent is filtered multiple times through the textile media leading to much higher effluent quality than conventional aerobic systems.
- Separate septic stages mean there is always a working septic tank even after periods of non use, this allows the system to stay in a relatively active state.
- The system comes fully constructed, making installation a plug and play operation which provides for a faster turnaround while minimizing installation problems.
- Large emergency storage reduces problems during pump or power failure. The system has approximately 2.5 days of emergency capacity without cross contamination (based on typical flow through 1200L/day)

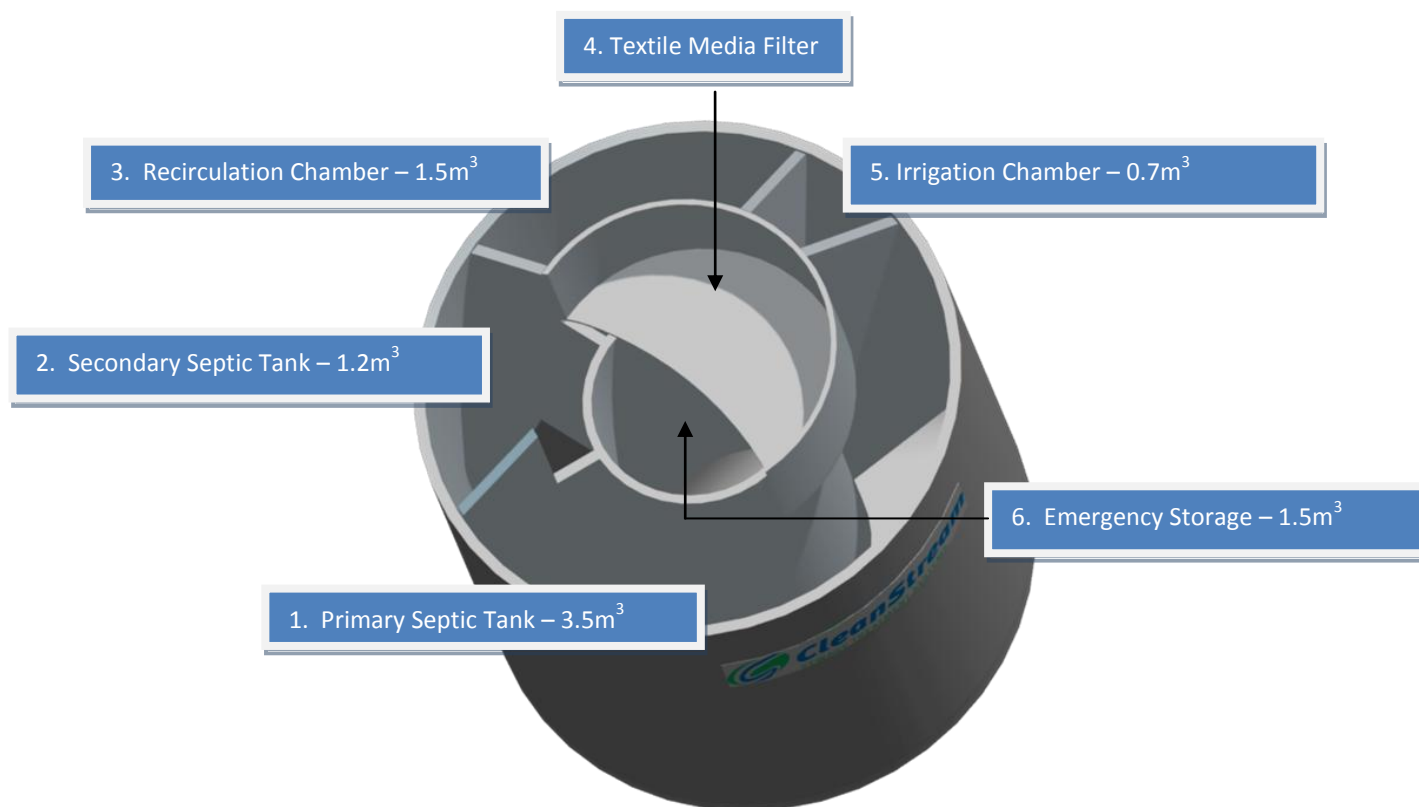
TREATMENT PERFORMANCE

12 monthly servicing is required to maintain efficient and effective treatment of household waste. This service must be performed by suitably trained personnel.

Expected treatment for medium size homes with daily flows up to 1500L is BOD5 10 mg/L, TSS 10 mg/L. However the system can treat up to 2000L per day whilst still complying with ARC TP58 effluent quality of BOD <15mg and TSS <15 mg/L for Advanced Secondary Treatment Systems – Packed Bed Reactors. Provision for 6 monthly service is required to achieve these larger daily flows.



TREATMENT OVERVIEW



1. The primary septic tank receives the wastewater. It acts like a conventional septic tank and reduces BOD and suspended solids. Effluent then passes through a particulates filter designed to stop large objects from inhibiting the treatment process further on.
2. The secondary septic provides an anoxic environment which aids in nitrate removal converting ammonia into nitrate, while reducing BOD and suspended solids. At the completion of this stage effluent passes through an attached growth filter, which provides an environment for denitrifying bacteria to flourish.
3. The Recirculation Chamber contains a large amount of emergency capacity and is a storage place for effluent before it passes through the textile filter.
4. From the Recirculation chamber treated wastewater is pumped onto the textile filter, this effectively aerates the effluent. Organic Nitrogen is converted to Ammonia by nitrifying bacteria. This process increases effluent quality as it passes through the textile media in the textile filter. The effluent then flows back into the secondary septic tank, unless there is sufficient forward flow to warrant irrigation in which case it drains into the irrigation chamber. Recirculation generally happens multiple times before irrigation is needed.
5. From the irrigation chamber the effluent is passed through a 130 micron Arkal Filter and then dispersed through self compensating drip irrigation.
6. In the event of pump failure emergency storage is provided in the central and recirculation chambers.



Thermakraft COVERTEK 403



**Thermakraft
ONE WRAP
SYSTEM**

10 Products - One system
One warranty

Thermakraft[™] COVERTEK 403

Non self-supporting roof and wall underlay

Kingspan Thermakraft Covertek 403 is a fire retardant, light weight roof and wall underlay designed as a means of managing condensation, water vapour transfer and water ingress. Primarily developed as a roof underlay, Covertek 403 can also be used on walls if you are after a one stop solution. It is not self-supporting as a roof underlay and is a more affordable option where a supporting component is to be installed in the building.

Covertek 403 comes in three roll sizes:

1350mm wide	18.6m long	25m ² coverage*
1350mm wide	37m long	50m ² coverage*
1350mm wide	55m long	75m ² coverage*

* **Note:** m² is the roll size for actual coverage, allow for laps and joins.





Covertek 403

Non self-supporting roof and wall underlay

Scope of Use

Roof Application

- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Can be used on roofs up to and including NZS 3604 'Extra High' wind zones.
- Covertek 403 requires underlay support (not self-supporting).
- Will provide temporary weather protection during construction (maximum 7 days for roof application), same day coverage recommended.

Wall Application

- Can be used with timber and steel framing, either directly fixed or in conjunction with an 18mm minimum drained cavity.
- With absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Is suitable for use in all Wind Zones of NZS 3604 up to, and including, 'Very High', when used as standalone flexible underlay, and 'Extra High' when used as a flexible underlay over a rigid wall underlay.
- Is suitable as an air barrier in unlined wall spaces.
- Will provide temporary weather protection during construction (maximum 42 days for wall application).

General

- Is fire retardant.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.
- Tear resistant and strong.

Limitations

- Cannot be exposed to the weather or UV for more than 7 days as a roof underlay and 42 days as a wall underlay.
- Can only be used as a Roof underlay on roofs of 10° pitch or greater.
- Must be used with underlay support products in roof application.
- Must not be used under translucent roof sheeting.

Compliance

Roof Application

- Covertek 403 can be used as a roof underlay within the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area.
- Refer BRANZ Appraisal No 917 (2020) and CodeMark certificate for full details.

Wall Application

- Covertek 403 can be used as a wall underlay within the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, with regards to building height and floor plan area
- Refer BRANZ Appraisal No 917 (2020) for full details.

Flammability Index

Covertek 403 Underlay has an AS 1530 Part 2 Flammability Index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Durability

Meets the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), and F2.3.1, providing:

- It is not damaged.
- Is installed in accordance with instructions.
- Is not left exposed for more than 7 days (roof) same day coverage recommended.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used.*

* **Note:** specifiers and product user must test for roof or wall cladding system compatibility with the underlay before installation.



Coverttek 403

Non self-supporting roof and wall underlay

Property Performance

The following data represents the minimum pass rates required by the NZBC. This product tests well beyond the minimum standards. If you require actual performance results, please contact your local Kingspan Insulation representative.

NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 150gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	≥ 100mm	≥ 0.1 MN.s/m ³
Property Performance	Pass	Pass	Pass	Pass	Pass	Pass*

* **Note:** Can be used as an air barrier.

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation to prevent moisture build-up in the roof cavities.

Factors which adversely affect the condensation risk in roofing systems include:

- Humid, and/or cold climatic regions.
- Warm/Skillion roof construction.
- Low roof cavity air volume and restricted air movement.
- Omitting Vapour Control Layers.
- Ceiling penetrations and entry of warm air into roof cavities.
- Occupancy activities which have high moisture loading on conditioned spaces.
- Low pitched roof.
- Bulk insulation.
- Building structures ability to naturally dry construction moisture.

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer MRM Code of Practice for details.

For passive ventilation of the roof space, it is recommended that all roof underlays are terminated at the ridge, and if not it should be slit or slotted to allow for passive ventilation. (For further information refer to the NZ MRM Roofing Code of Practice).

Product Warranty

Standard Kingspan Insulation Warranty applies. Refer to Kingspan Insulation Warranty statement for further details. This is available online at thermakraft.co.nz or call **0800 806 595**.



0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.



The recommendations contained in Kingspan's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Kingspan (for example quality of workmanship and design), Kingspan shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found online. E&OE.

BCO10364430 Received by Auckland Council 10/03/2023



Arch Series	Dimensions (mm)		IGU		U window (W/m ² K)	R window (m ² K/W)	WEERS Star Rating
	Width	Height	IGU	Ucog (W/m ² K)			
AW	1800	1500	Solux-E	1.10	2.988	0.335	3
OO HD	1050	2710			3.184	0.314	2.5
OI HD	1050	2710			2.940	0.340	3
BD 2P	3000	2000			2.736	0.366	3.5
BD 3P	5000	2000			2.646	0.378	4
SD 2P	2710	2500			2.936	0.341	3
SD 3P	3000	2400			2.264	0.442	5
SD 4P	7200	2900			2.214	0.452	5

Kind Regards

Graham Boal
Technical Services



APL | WINDOW SOLUTIONS
19 Northpark Drive, PO Box 10080, Hamilton 3241
P +64 7 849 2113 | M 027 224 5079 | W www.aplnz.co.nz

Sustainability | Please consider the environment before printing this email

BCO10364430 Received by Auckland Council 01/06/2023



jameshardie.co.nz

Hardie™ Flex Sheet

Hardie™ Flex Sheet

Technical Specification

October 2021 New Zealand





We value your feedback!

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie™
literaturefeedback@jameshardie.co.nz

Make sure your information is up to date

When specifying or installing Hardie™ fibre cement products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at www.jameshardie.co.nz or **Ask James Hardie™** on 0800 808 868.



Contents

1	Application and scope	4	6	Jointing	12
1.1	Application	4	6.1	General	12
1.2	Scope	4	6.2	Vertical Joint	12
1.3	Details	4	6.3	Internal Corner and External Corner	12
1.4	Specific Design	4	6.4	Horizontal Joint	12
2	Design	5	7	Finishing	13
2.1	Compliance	5	7.1	Preparation	13
2.2	Responsibility	5	7.2	Sealants	13
2.3	Site and Foundation	5	7.3	Coating	13
2.4	Clearances	5			
2.5	Moisture Management	6	8	Care & Maintenance	14
2.6	Structure	6			
2.7	Wind Loading	6			
2.8	Structural Bracing	6			
2.9	Fire Rated Walls	6			
2.10	Energy Efficiency	6			
3	Framing	7	9	Product Information	14
3.1	General	7	9.1	Manufacturing and Classification	14
3.2	Dimensions	7	9.2	Product Mass	14
3.3	Timber Grade	7	9.3	Sheet Sizes	15
3.4	Durability	7	9.4	Durability	15
3.5	Frame Construction	8	9.4.1	Resistance to moisture/rotting	15
3.5.1	Direct Fix Construction Method	8	9.4.2	Fire performance	15
3.5.2	Cavity Construction Method	8	9.4.3	Alpine regions	15
3.6	Tolerances	8			
3.7	Curved Walls	8			
4	Preparation	9	10	Safe Working Practices	16
4.1	Flexible Underlay/HomeRAB™ Pre-Cladding	9	10.1	Storage and delivery	18
4.2	Rigid Air Barrier	9	10.2	Tips for safe and easy handling of Hardie™ Flex Sheet	19
4.3	Vent Strip	9			
4.4	Cavity Battens	9			
4.5	Flashings	10			
5	Fixing	10	11	Accessories	20
5.1	General	10			
5.2	Fastener Durability	10			
5.3	Fastener — size and layout	11			
5.4	Gun Nailing	11			
5.5	Sheet layout	11			
				Product Warranty	51



1 Application and scope

1.1 Application

Hardie™ Flex Sheet is manufactured from fibre cement which is a composition of Portland cement, ground sand, cellulose fibre and water. Hardie™ Flex Sheet is a paneled light weight wall cladding solution for residential and light commercial buildings.

- Hardie™ Flex Sheet is ideal for many general building purposes such as wall cladding, wide soffits, porches and gable ends etc.
- Hardie™ Flex Sheet is a natural unsanded sheet and is suitable for a paint finish. A variety of jointing methods can be used to achieve the desired look.

If you are a specifier

Or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

If you are an installer

Ensure that you follow the design, moisture management principles, associated details and material selection provided by the designer. All the details provided in this document must be read in conjunction with the specifier's specification.

Make sure your information is up to date

When specifying or installing Hardie™ fibre cement products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 Scope

The scope of this specification is for the use of Hardie™ Flex Sheet limited to buildings which fall within the scope limitations of New Zealand Building Code (NZBC) Acceptable Solution 'E2/AS1' paragraph 1.1. This manual covers the use of Hardie™ Flex Sheet for either construction methods i.e. direct fixed or cavity, used in external walls of timber framed buildings. Please refer to 'E2/AS1' for further information regarding the selection of construction methods for claddings.

This document is intended for use by architects, designers and specifiers who may be involved with the specification of Hardie™ Flex Sheet.

1.3 Details

Various Hardie™ Flex Sheet details are provided in the Details section of this document. This specification and details in CAD file are also available to download from our web site at www.jameshardie.co.nz.

1.4 Specific Design

For use of Hardie™ Flex Sheet outside the scope of this document, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.



2 Design

2.1 Compliance

Hardie™ Flex Sheet complies with section 9.7.2 of 'E2/AS1'. Information contained in this document is aligned with the requirements of NZBC Acceptable Solution 'E2/AS1'.

2.2 Responsibility

The specifier or other party responsible for the project must run through a risk matrix analysis to determine which construction method is to be used. The designer must also ensure that the figures published in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this specification. The designers should ensure that the intent of their design meets the requirements of the NZBC.

All dimensions shown are in millimetres unless noted otherwise. All New Zealand Standards reference in this manual are current edition and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 Site and Foundation

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'. Foundations design must comply with the requirements of NZS 3604 'Timber-framed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulation in accordance with NZBC requirements.

2.4 Clearances

The clearance between the bottom edge of cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

Hardie™ Flex Sheets must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604.

Hardie™ Flex Sheets must have a minimum clearance of 100mm from paved ground and 175mm from unpaved ground.

On roofs and decks the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground. Refer to Figures 3 and 22.



2.5 Moisture Management

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design. Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled.

Walls shall include those provisions as required by the NZBC Acceptable Solution 'E2/AS1' 'External Moisture'. In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in external walls, must comply with the requirements of relevant standards and the NZBC. For further information on designing for weathertightness refer to BRANZ Ltd and the Ministry of Business Innovation and Employment (MBIE) updates on the following websites respectively, www.branz.co.nz and www.building.govt.nz.

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections.

2.6 Structure

Timber framed buildings must be designed in accordance with NZS 3604 (Timber-framed buildings). When the framing is provided as per the specific engineering design, the framing stiffness must be equivalent to or more than the stiffness requirements of NZS 3604.

2.7 Wind Loading

Hardie™ Flex Sheet cladding are suitable for use in all New Zealand wind zones up to and including EH as defined in NZS 3604. A specific design is required for all situations where the buildings fall in a specific engineering design (SED) wind zone.

2.8 Structural Bracing

Hardie™ Flex Sheet can be used to achieve structural bracing required for timber framed buildings designed and constructed in accordance with NZS 3604. The Hardie™ Flex Sheet must be installed as per specific bracing system details that are available separately. Hardie™ Flex Sheet bracing systems have been independently tested and assessed by Scion for direct fix construction. For cavity fix construction bracing can be achieved by using HomeRAB™ Pre-Cladding or RAB™ Board fixed direct to the framing or by using internal linings such as Villaboard™ Lining or plasterboard bracing systems. Refer to James Hardie Bracing Design Manual for details.

2.9 Fire Rated Walls

Hardie™ Flex Sheet clad walls using direct fix or cavity construction method can achieve fire ratings up to 60/60/60 when the walls are constructed in accordance with this literature and include the fire rated system requirements as specified in James Hardie Fire and Acoustic Design Manual. Refer to Fire and Acoustic Design Manual for further information about fire rated systems.

2.10 Energy Efficiency

External walls constructed as per this technical specification, using Hardie™ Flex Sheet, must use suitable bulk insulation to meet the minimum thermal insulation requirements as per Clause H1/AS1 'Energy Efficiency' of the NZBC.



3 Framing

3.1 General

This Hardie™ Flex Sheet technical specification is only suitable for timber framed buildings. Other framing materials are outside the scope of this specification.

3.2 Dimensions

A 45mm (nominal) minimum stud width is required at all sheet edges.

3.3 Timber Grade

Minimum timber grade requirements are No.1 Framing grade as per NZS 3631 'New Zealand Timber Grading Rules' or equivalent.

3.4 Durability

The external framing must be treated to a minimum H1.2 treatment. Refer to the NZBC Acceptable Solution B2/AS1 'Durability' for further information about the durability requirements.

For timber treatment and allowable moisture content information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at sites in accordance with the recommendations of the framing manufacturer.

Note: Refer to NZS 3602 for information about the allowable moisture content in timber.

3.5 Frame Construction

The framing must fully support all sheet edges. The framing must be rigid and not rely on the cladding sheet for stability.

All timber framing sizes and set-out must comply with NZS 3604 and as specified in this specification. Use of timber framing must be in accordance with framing manufacturer's specification.

In case of gable end trusses sitting on top plates of external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by an independent design producer statement.

For specific engineering design for timber framing refer to NZS 3603 and AS/NZS 1170.

3.5.1 Direct Fix Construction Method

Buildings with a risk score of 1-6 calculated in accordance with the NZBC Acceptable Solution 'E2/AS1' Table 2, Hardie™ Flex Sheet can be direct fixed.

For direct fixed construction method the following framing is required:

- Studs provided at 600mm centres maximum
- Nogs/dwangs provided at 1200mm centres maximum



3.5.2 Cavity Construction Method

Buildings with a risk score of 7-20 calculated in accordance with NZBC Acceptable Solution 'E2/AS1' Table 2, require Hardie™ Flex Sheet to be installed on a cavity.

For cavity construction method the following framing is required:

- When studs are spaced at 600mm centres maximum then the nogs/dwangs must be provided at 800mm centres maximum
- When studs are spaced at 400mm centres then the nogs/dwangs may be provided at 1200mm centres
- An extra stud is required in internal corners

3.6 Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true.

Framing tolerances must comply with the requirements of NZS 3604. All framing shall be made flush.

3.7 Curved Walls

Hardie™ Flex Sheet can be used in a curved application. Refer to James Hardie technical support for further information.



4 Preparation

4.1 Flexible Underlay/HomeRAB™ Pre-Cladding

Flexible underlay or HomeRAB™ Pre-Cladding Lining must be provided as per the requirements of the NZBC Acceptable Solution E2/AS1 'External Moisture' and NZS 3604. The flexible underlay must comply with Table 23 of E2/AS1 and AS/NZS 4200.1. The flexible underlay must be fixed in accordance with E2/AS1, NZS 3604 and AS/NZS 4200.2 'Pliable Building Membranes and Underlay – Installation' standard and the underlay manufacturer's recommendations.

Walls which are not lined on the inside face e.g. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of the NZBC Acceptable Solution E2/AS1 Table 23. HomeRAB™ Pre-Cladding is suitable for use in these applications. It must be installed in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

4.2 Rigid Air Barrier

For EH wind zones a rigid air barrier ie RAB™ Board must be used in lieu of flexible underlays. To achieve the temporary weathertightness using HomeRAB™ Pre-Cladding or RAB™ Board, windows/doors need to be temporarily installed. Refer to the HomeRAB™ Pre-Cladding and RAB™ Board installation manual for information regarding its installation.

4.3 Vent Strip

The Hardie™ uPVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Hardie™ uPVC vent strip has an opening area of 1000mm²/m length.

4.4 Cavity Battens

The cavity battens provide airspace between the frame and the sheet and are considered a 'packer' only in this specification.

The timber battens must be minimum H3.1 treated in accordance with NZS 3640 (Chemical preservation of rough and sawn timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with following requirements:

- Be minimum 18mm thick
- Be minimum as wide as the width of studs
- When studs are at 600mm centres battens to be provided at 300mm centres
- Be fixed by the cladding fixings to the main framing through the flexible underlay
- Until claddings are fixed the battens only need to be tacked to the framing

Note: Batten fixing is required temporarily to keep them straight on the wall during construction.

No intermediate batten between studs is required:

- When studs are spaced at maximum 400mm centres and/or
- When rigid sheathings instead of building underlays are used

Note: 100mm long cavity packers must be used where required to support fixings in this circumstance.

Battens must be fixed with 40 x 2.8mm Hardie™ Flex nails at 800mm centres maximum.



4.5 Flashings

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to sheet installation. Please refer to moisture management requirements in Clause 2.5.

The flexible underlay must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of flexible underlay. James Hardie will assume no responsibility for water infiltration within the wall due to poor installation of flashings or flexible underlays. The selected flashing materials must comply with the durability requirements of the NZBC Acceptable Solution 'E2/AS1' clause 9.7.2.1 for back sealing.

5 Fixing

5.1 General

Hardie™ Flex Sheets must be kept dry and under cover whilst in storage or during installation. Framing moisture contents must not exceed the maximum limit specified in NZS 3602 prior to sheet installation. Every endeavour must be made to keep framing dry once sheet fixing commences.

All sheet edges must be sealed prior to installation. The sheet edges must also be sealed around window/door openings and other penetrations e.g. meter boxes etc. Direct fix Hardie™ Flex Sheet must be primed 100mm across back face from edges.

5.2 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing material to be used in relation to exposure conditions and are summarised in Table 1.

Table 1

Exposure conditions and nail selection prescribed		
Zone	Application	
D (sea spray)* and geothermal hot spots	General	Stainless steel 304/316
	Fire	
	Bracing	
C and B	General	Hot dip galvanised **
	Fire	
	Bracing	

* Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

**Hot dip galvanised must comply with AS/NZS 4680.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.



5.3 Fastener – size and layout

Hardie™ Flex Sheet must be fixed to framing using the fixings as specified in Table 2 and in accordance with the following requirements:

- Nails must have a minimum clearance of 12mm from sheet edges and a minimum of 75mm vertically and 150mm horizontally from sheet corners
- Nails must finish flush with sheet surface
-

Table 2

Sheet fixing	
Direct to stud fixing	
40 x 2.8mm Hardie™ Flex nails	Fix sheet at 200mm centres at all sheet edges as well as all intermediate framing.
Cavity construction up to and including VH wind zones over flexible underlay	
60 x 3.15mm Hardie™ Flex nails	Fix sheet at 200mm centres at all studs and at 150mm centres at top plate and bottom plate.
Cavity construction up to and including EH wind zone or with ULS design wind pressure of up to 2.5kPa over HomeRAB™ Pre-Cladding or RAB™ Board	
75 x 3.15mm Hardie™ Flex nails	Fix sheet at 150mm centres at all sheet edges as well as all intermediate framing.

Note: Special fixing arrangements are required for bracing and fire-resistance rated wall systems. For more information Ask James Hardie on 0800 808 868.

5.4 Gun Nailing

Hardie™ Flex Sheets can be fixed using nail guns. The gun nails used must have a full round head to provide the required holding power. The length and gauge of nails must at a minimum be as specified in this document. Check with nail gun manufacturer for more information.

Note: Do not use D Head nails. Do not use gun nailing for bracing applications.

5.5 Sheet layout

- All sheet edges must be supported by the framing
- Hardie™ Flex Sheet must be fixed vertically



6 Jointing

6.1 General

Hardie™ Flex Sheets can be jointed in a number of ways to achieve different panelised look of the walls.

6.2 Vertical Joint

Hardie™ Flex Sheets could have the following types of vertical joints.

- uPVC Hardie™ Joiner, refer to Figure 4 and 23
- Timber Batten Joint, refer to Figure 5 and 24
- Flexible Sealant Joint, refer to Figure 6 and 25

6.3 Internal Corner and External Corner

Hardie™ Flex Sheet could have the following types of internal and external corners.

- uPVC Joiner, refer to Figure 7, 8, 26, 27 and 34
- Timber Batten Joint, refer to Figure 9, 10, 28 and 29
- Flexible Sealant Joint, refer to Figure 11, 12, 30 and 31

6.4 Horizontal Joint

At floor joist levels a horizontal joint must be provided to accommodate the movement resulting from timber joist shrinkage and settlement.

- For Hardie™ Flex Sheets use a Hardie™ uPVC 'h' mould to form a horizontal joint or a purpose made metal 'Z' flashing could also be used to form a horizontal joint



7 Finishing

7.1 Preparation

Painting of Hardie™ Flex Sheets is required in order to meet the durability requirements of the NZBC and product warranties. Hardie™ Flex Sheets must be dry and free from dirt before painting. Coating must be completed within 3 months of sheet installation.

When using uPVC flashings, the light reflective value of the colour used must be more than 40% as required under 'E2/AS1'. Dark colours cause excessive movement and deteriorate the cladding performance.

7.2 Sealants

All sealants must meet the relevant requirements of the NZBC. Their application usage must be in accordance with manufacturer's instructions. Check with sealant manufacturer prior to coating over sealants. Some sealant manufacturers do not recommend coating over their product.

7.3 Coating

Use only quality exterior paints complying with AS 3730. Manufacturer's specification for the selected paint must be followed. Note that some paints require undercoat before applying the finish coat. Prior to coating, the surface should be examined to ensure it is clean, dry and free of any dust or contaminants. When using uPVC flashings, the light reflective value (LRV) for the colour must not be less than 40%.

All exposed faces, including the top edges under the sills and bottom edges of Hardie™ Flex Sheet must be finished with an exterior paint system. Paints with a low LRV will absorb more solar heat and could cause the components used in the wall to expand or contract. This combined with glossy paints and wet timber used at construction stage, could lead to increased chances of fastener read through as is common with any other building material.

For best aesthetic results a low sheen paint is recommended. Enamel — based paints can be used, utilising a three-coat system. Refer to the paint manufacturer for details before commencing the coating work.

Paint must not be applied when the temperature is below 10^o C.



8 Care & Maintenance

The extent and nature of maintenance will depend on the geographical location and exposure of the building. It is the responsibility of the specifier to determine normal maintenance required to comply with the NZBC Acceptable Solution B2/AS1. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months using low pressure water and a brush, and every 3-4 months in extreme coastal conditions or sea spray zones
- Re-coating exterior protective finishes. Always refer to your paint manufacturer for re-coating requirements
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants that may provide a means of moisture entry beyond the exterior cladding
- Cleaning out gutters, blocked pipes and overflows as required
- Pruning back vegetation that is close to or touching the building.
- The clearances between the bottom edge of Hardie™ Flex Sheet and the finished/unfinished ground must always be maintained.

9 Product Information

9.1 Manufacturing and Classification

Hardie™ Flex Sheets are a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water. The sheets are easily identified by the name 'Hardie™ Flex' printed on the back face of sheet.

Hardie™ Flex Sheets are manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets') standards in New Zealand. James Hardie is an ISO 9001 certified manufacturer. Hardie™ Flex Sheets are classified Type A, Category 3 in accordance with AS/NZS 2908.2 'Cellulose-Cement Products'.

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

9.2 Product Mass

Hardie™ Flex Sheets are manufactured in 6.0 mm thick sheet with a Mass of 8.6 kg/m² at EMC.

Hardie™ Flex Sheets are defined as a Light Weight Wall Cladding (not exceeding 30kg/m²) as per NZS 3604.



9.3 Sheet Sizes

Available sizes of Hardie™ Flex Sheets are specified in Table 3.

Table 3

Sheet sizes Hardie™ Flex Sheets				
Thickness (mm)	Width (mm)	Length (mm)		
		2400	2700	3000
6	1200	400172	400170	400168

9.4 Durability

Hardie™ Flex Sheets, when installed and maintained as per the technical specification, will meet the durability requirements for claddings as required in the NZBC Approved Document B2 'Durability'.

9.4.1 Resistance to moisture/rotting

Hardie™ Flex Sheets demonstrate resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Heat Rain (Clause 6.5)
- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Soak Dry (Clause 8.2.5)

9.4.2 Fire performance

Hardie™ Flex Sheet has been tested/assessed to AS/NZS 3837 and is suitable for use where non-combustible materials are specified.

9.4.3 Alpine regions

In regions subject to freeze/thaw conditions, Hardie™ Flex Sheet must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snow drifts over winter are expected.

The Hardie™ Flex Sheet has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.



10 Safe Working Practices

WARNING – DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

Hardie™ fibre cement products contain sand, a source of respirable crystalline silica. May cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/NZS 1716 P1 filter and refer to Australian/New Zealand Standard 1715:2009 Selection, Use and Maintenance of Respiratory Protective Equipment for more extensive guidance and more options for selecting respirators for workplaces. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

Crystalline Silica is

- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

Why is Crystalline Silica a health hazard?

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

When is Crystalline Silica a health hazard?

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)



Avoid breathing in crystalline silica dust

Safe working practices

- ✗ NEVER use a power saw indoors or in a poorly ventilated area
- ✗ NEVER dry sweep
- ✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up
- ✗ NEVER use grinders
- ✓ ALWAYS use a dust reducing circular saw equipped with a sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the Hardie™ Blade name or one with at least equivalent performance – connected to an M Class or higher vacuum
- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ✓ ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

Use one of the following methods for cutting Hardie™ Flex Sheet:

Best

- Hardie™ Knife
- Hand guillotine
- Fibreshear

Better

Dust reducing circular saw equipped with Hardie™ Blade Saw Blade and connected to a M Class or higher vacuum.

When cutting outdoors

- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Cut products with either a Hardie™ Knife or fibre cement shears or, when not feasible, a Hardie™ Blade Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
 - Wear your P1 or higher mask (correctly fitted in accordance with manufacturers' instructions), ask others to do the same.
 - Keep persons on site at least 2 metres and as far as practicable away from the cutting station while the saw is in operation
 - If you are not clean shaven, then use a powered air respirator with a loose-fitting head top
 - Wear safety glasses
 - Wear hearing protection
 - When others are close by, ask them to do the same
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum



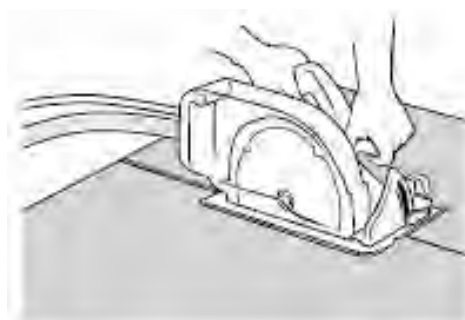
When cutting indoors

- ✗ Never cut using a circular saw indoors
- ✓ Position cutting station in a well ventilated area
- ✓ Cut ONLY using a Hardie™ Knife, hand guillotine or fibreshears (manual, electric or pneumatic)
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

Working instructions

Hardie™ Blade Saw Blade

The Hardie™ Blade Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of Hardie™ fibre cement products. A dust-reducing saw uses a dust collector connected to a M Class or higher vacuum. When sawing, clamp a straight edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



Hole forming

For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill



For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

10.1 Storage and delivery

Keeping products and people safe

Off loading

- ✓ Hardie™ fibre cement products should be off-loaded carefully by hand or by forklift
- ✓ Hardie™ fibre cement products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

Hardie™ fibre cement products should be stored:

- ✓ In their original packaging
- ✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- ✓ Off the ground – either on a pallet or adequately supported on timber or other spacers
- ✓ Flat so as to minimise bending



Hardie™ fibre cement products must not be stored:

- ✗ Directly on the ground
- ✗ In the open air exposed to the elements

James Hardie is not responsible for damage due to improper storage and handling.

10.2 Tips for safe and easy handling of Hardie™ Flex Sheet

- ✓ Carry with two people
- ✓ Hold near each end and on edge
- ✓ Exercise care when handling sheet products to avoid damaging the edges/corners

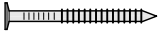
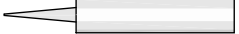
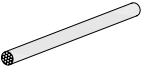
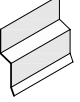


11 Accessories

Accessories/tools supplied by James Hardie				
Accessory		Code	Size (mm)	Material/appearance
	6mm Capping Mould 2400 3000	300539 300540	2400 long 3000 long	uPVC/Bone colour
	6mm Horizontal Flashing	302254	3000 long	uPVC/Bone colour
	6mm Hardie™ Jointer 2400 3000	300730 300734	2400 long 3000 long	uPVC/Bone colour
	Vent Strip	302490	3000 long	uPVC
	Horizontal Flashing Jointer	301921	100 long	uPVC/Bone colour
	Corner Flashing Jointer	301920	50 x 50	uPVC/Bone colour
	Inseal 3259 1.5mm thick 48mm 80mm	300767 300769	50m roll 50m roll	Black Compressible Foam
	Hardie™ Flex Nail - 5kg	302782 302784	60 x 3.15mm x 6.8mmø head size	316 Stainless Steel Hot Dip Galvanised
	Hardie™ Flex nail - 5kg	304253 304251	75 x 3.15mm	316 Stainless Steel Hot Dip Galvanised
	Hardie™ Blade Saw Blade	300660	4 tooth — 184mm	316 Stainless Steel Diamond Tipped
	Corner Underflashing 50 x 50mm	303745	3000 long	uPVC/Bone colour
	2 piece Internal Corner	305756	3000 long	uPVC/Bone colour
	2 piece External Corner	305755	3000 long	uPVC/Bone colour
	Hardie™ Knife Scoring tool for easy cutting.	305926		
	Axent Trim 84mm	401943	84 x 2600 long	
	Axent Trim 100mm	401930	100 x 2600 long	



James Hardie recommends the following products for use in conjunction with its Hardie™ Flex Sheets. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.

	Accessory	Size (mm)	Material/appearance
	Hardie™ Flex nail/Fibre Cement nail	40 x 2.8mm	316 Stainless Steel
	Hardie™ Flex nail/Fibre Cement nail	40 x 2.8mm	Hot Dip Galvanised
	Sikaflex® AT-Facade or similar	Tube	
	PEF rod Sika® Boom or similar	Polyethylene foam	
	Flashing tape	Proprietary tape to adhere to flexible underlay	
	Inseal® 3109 Sealing Strip	19mm x 10mm x 12m	Black Compressible Foam
	Flashing to Table 20 'E2/AS1'	Refer Figure 13	Flashing fabricator



12 Details

Various details outlined in the following table are available on Pages 23 to 50.

Table 4

Details				
Description	Direct fixed		Cavity construction	
	Figure	Page	Figure	Page
Framing	Figure 1	23	Figure 19	35
Sheet Fixing	Figure 2	24	Figure 21	37
Concrete Foundation Detail	Figure 3	25	Figure 22	38
Vertical uPVC Joint	Figure 4	26	Figure 23	39
Timber Batten Joint	Figure 5	26	Figure 24	39
Vertical Sealant Joint	Figure 6	27	Figure 25	40
Internal uPVC Corner Joint	Figure 7	27	Figure 26	40
External uPVC Corner Joint	Figure 8	28	Figure 27	41
Internal Timber Batten Corner	Figure 9	28	Figure 28	42
External Timber Batten Corner	Figure 10	29	Figure 29	42
Internal Sealant Joint Corner	Figure 11	29	Figure 30	43
External Sealant Joint Corner	Figure 12	30	Figure 31	43
Horizontal Control Joint	Figure 13	31	Figure 33	45
Soffit Detail	Figure 14	32	Figure 32	44
'h' Mould Jointer	Figure 15	32		
Window Sill	Figure 16	33	Figure 35	47
Window Head	Figure 17	34	Figure 36	47
Window Jamb	Figure 18	34	Figure 37	48
Cavity Batten Fixing			Figure 20	36
Corner to 'h' Mould Joint			Figure 34	46
One Piece Apron Flashing Joint			Figure 38	49
Parapet Flashing			Figure 39	50
Pipe Penetration			Figure 40	50

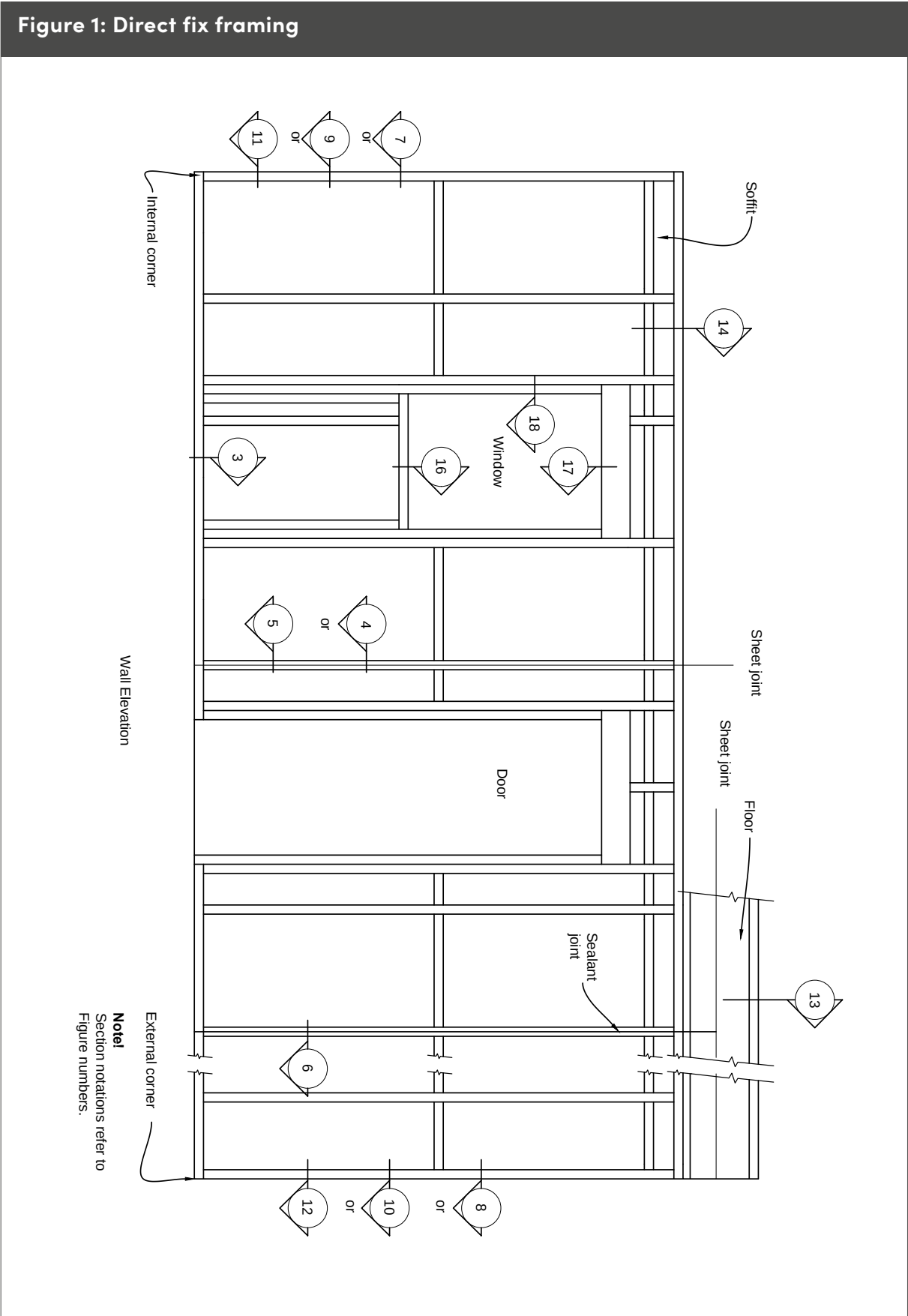


Figure 2: Direct fix sheet fixing

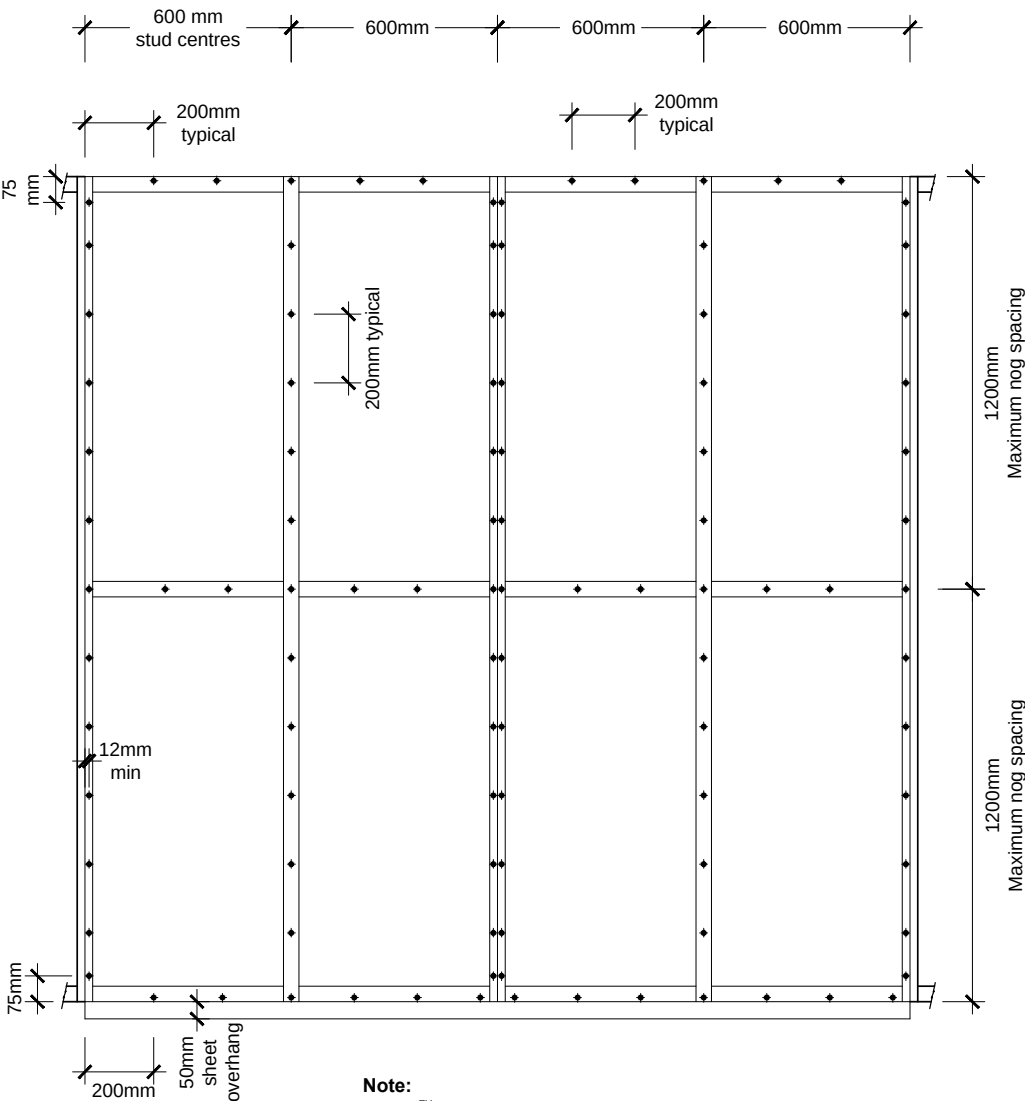




Figure 3: Direct fix concrete foundation detail

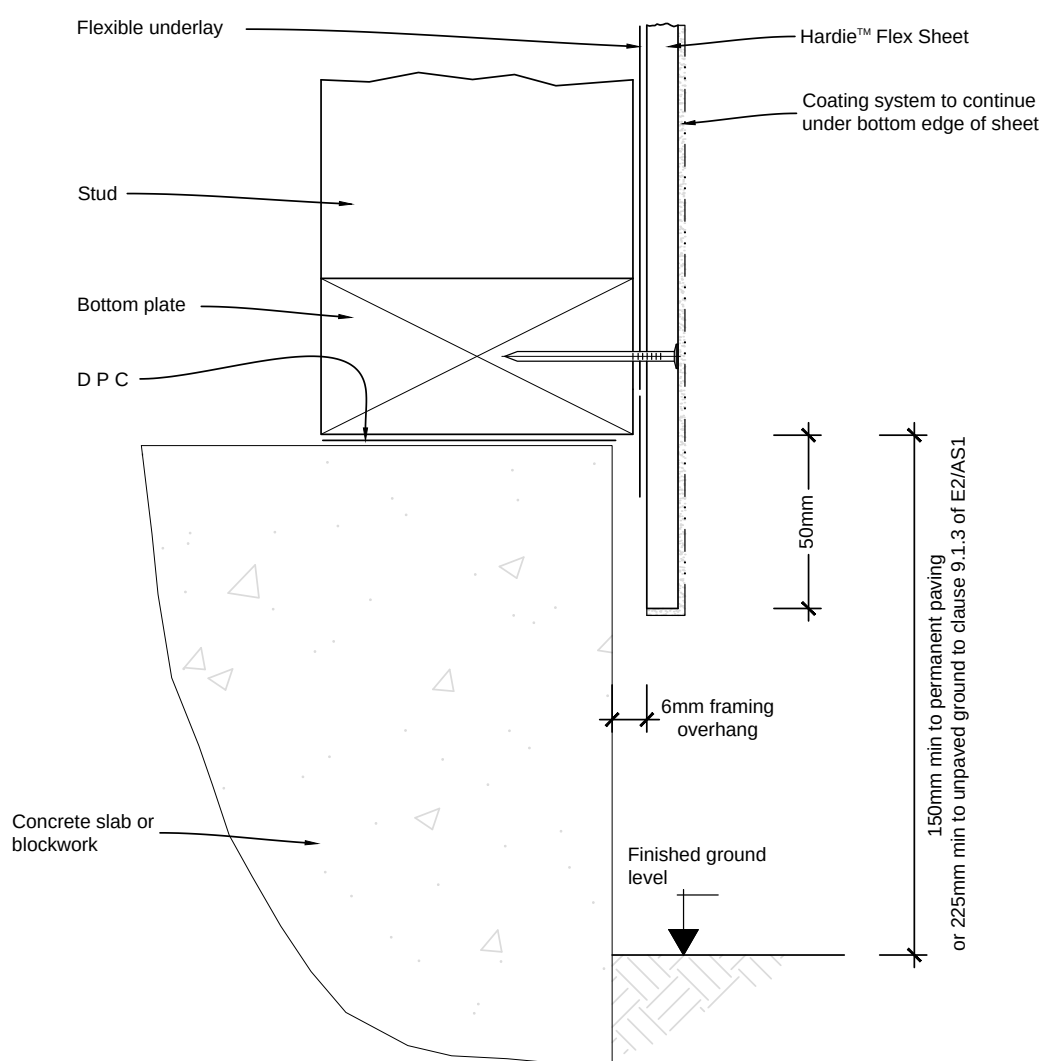




Figure 4: Direct fix vertical uPVC joint

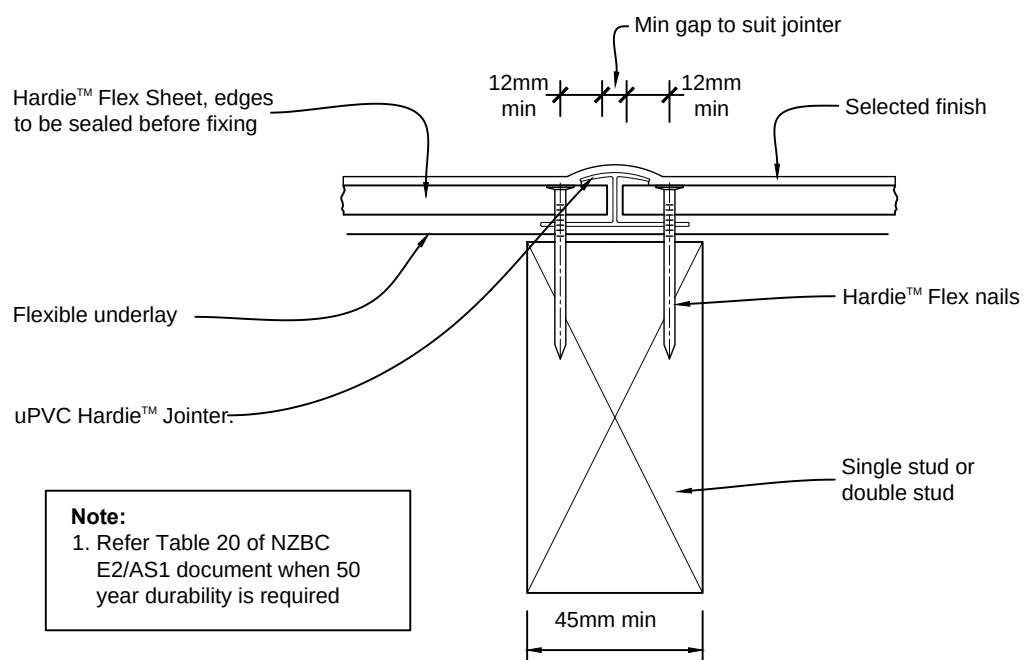
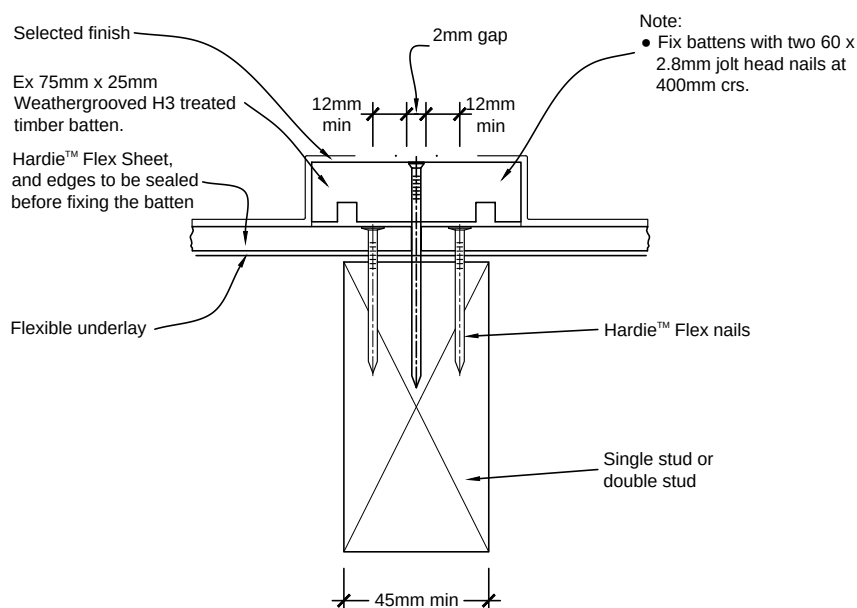


Figure 5: Direct fix vertical timber batten joint



Alternatively an Axent™ Trim with two 6mm continuous beads Bostik Seal N Flex-1 can be used.



Figure 6: Direct fix vertical sealant joint

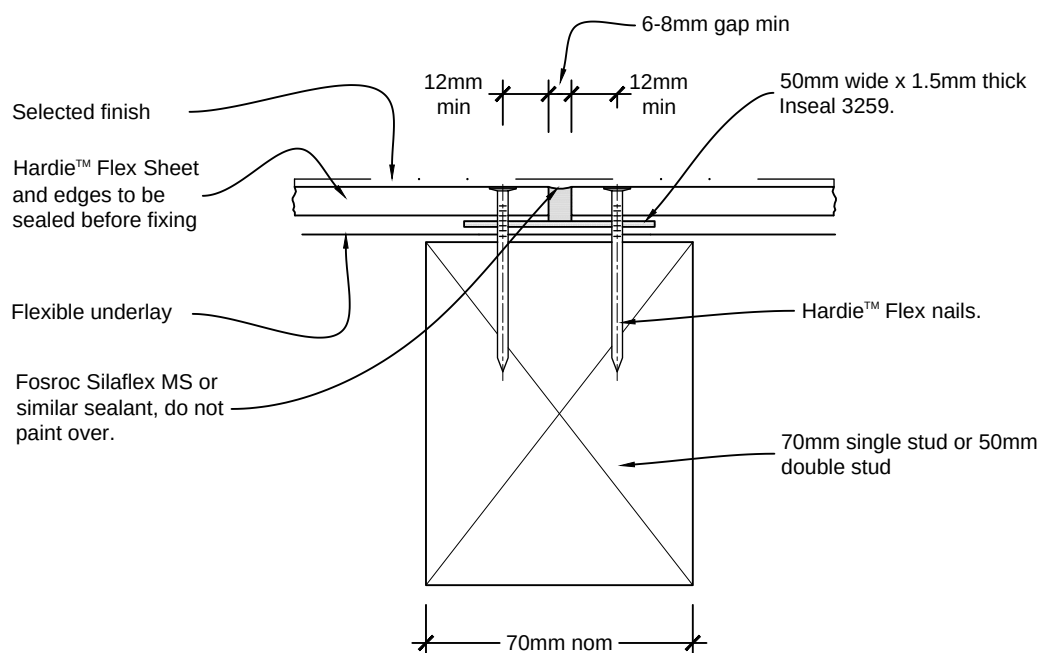
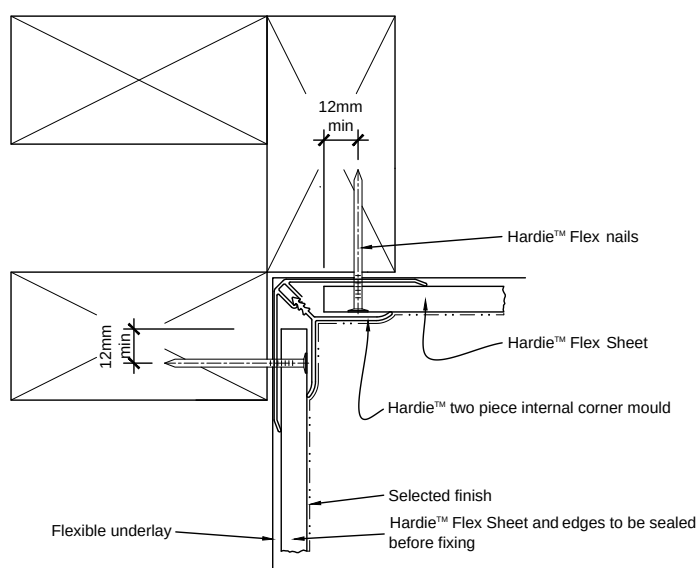


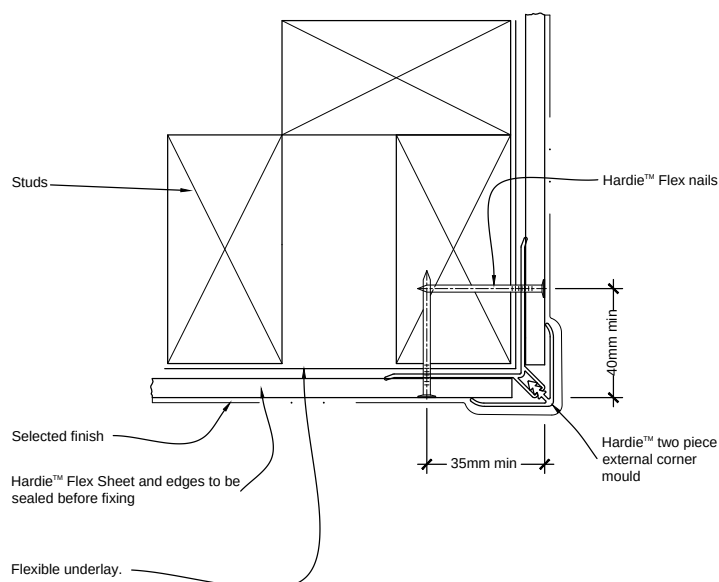
Figure 7: Direct fix internal uPVC corner joint



Note:
1. Refer Table 20 of NZBC E2/AS1 document when 50 year durability is required.



Figure 8: Direct fix external uPVC corner joint



Note:
1. Refer Table 20 of NZBC E2/AS1 document when 50 year durability is required.

Figure 9: Direct fix internal timber batten corner

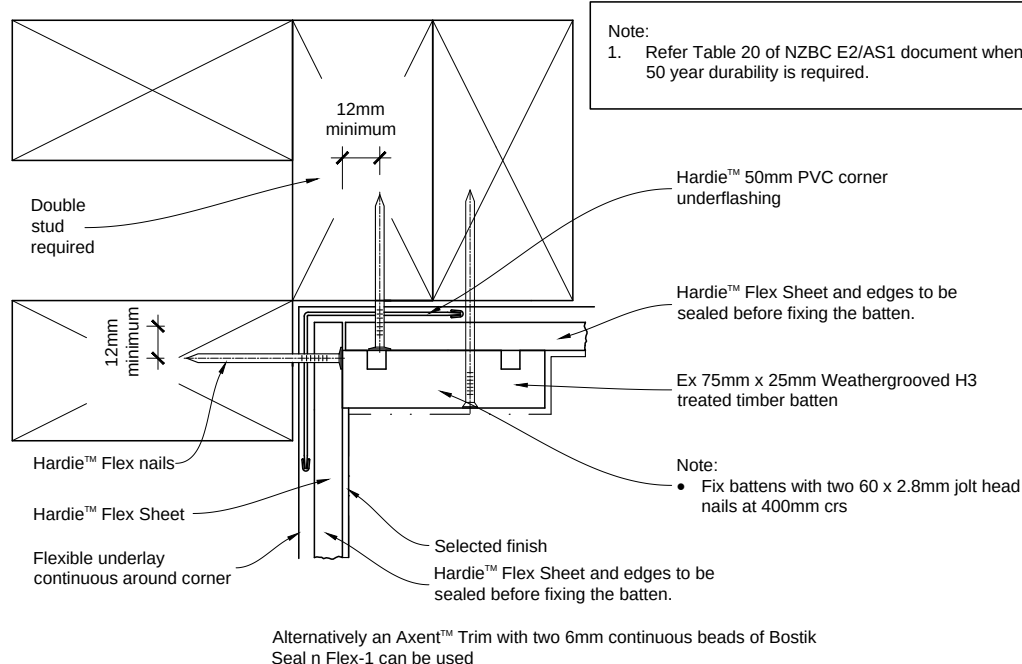




Figure 10: Direct fix external timber batten corner

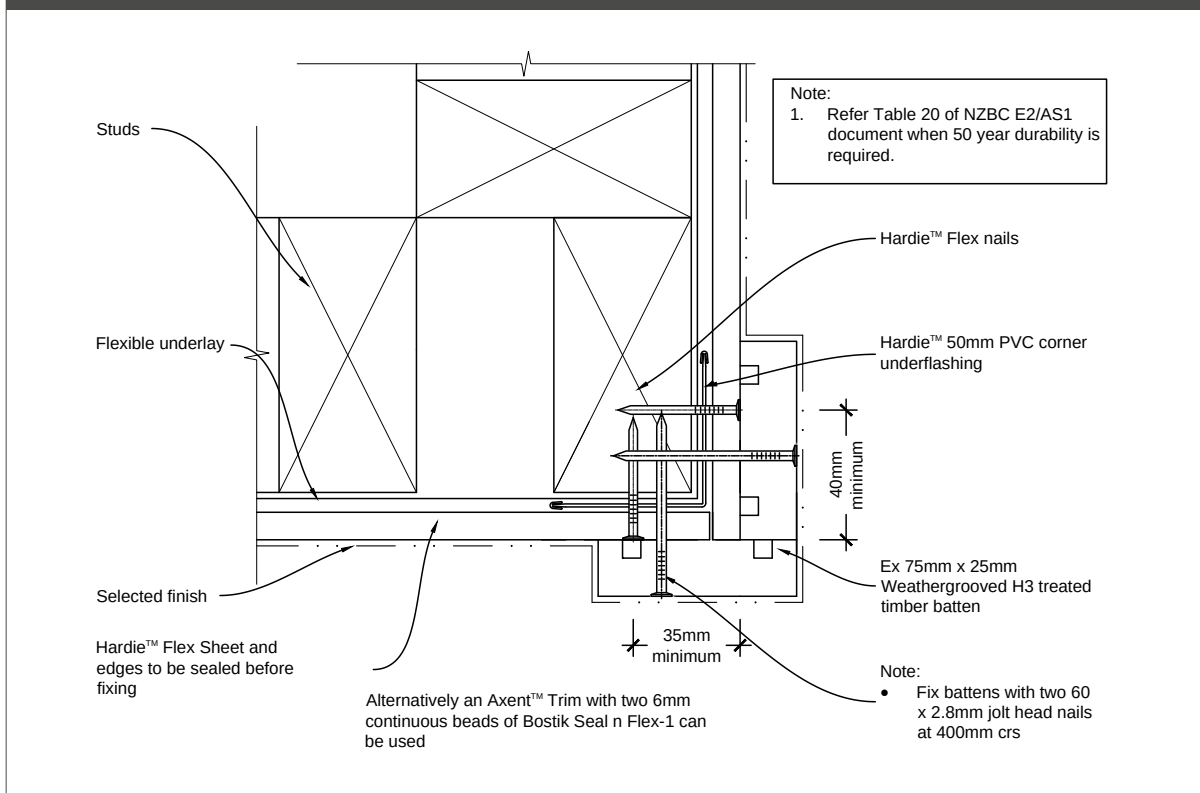


Figure 11: Direct fix internal sealant joint corner

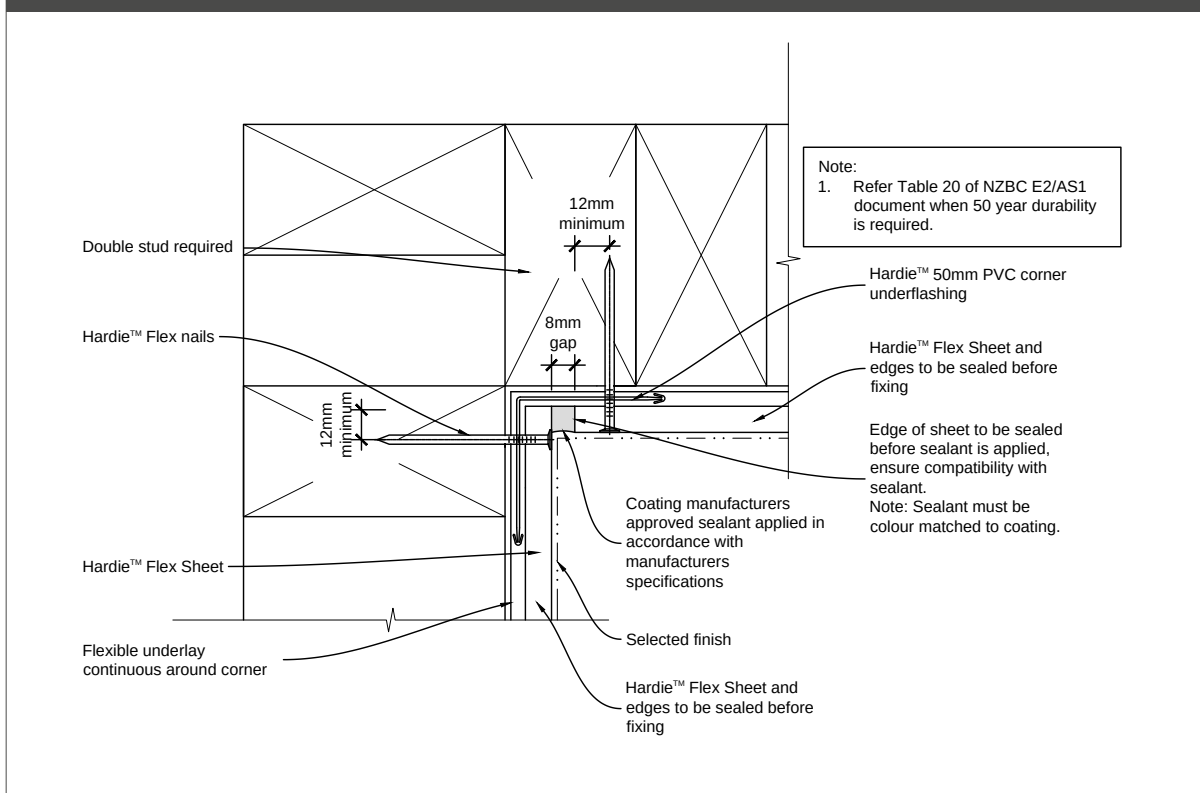




Figure 12: Direct fix external sealant joint corner

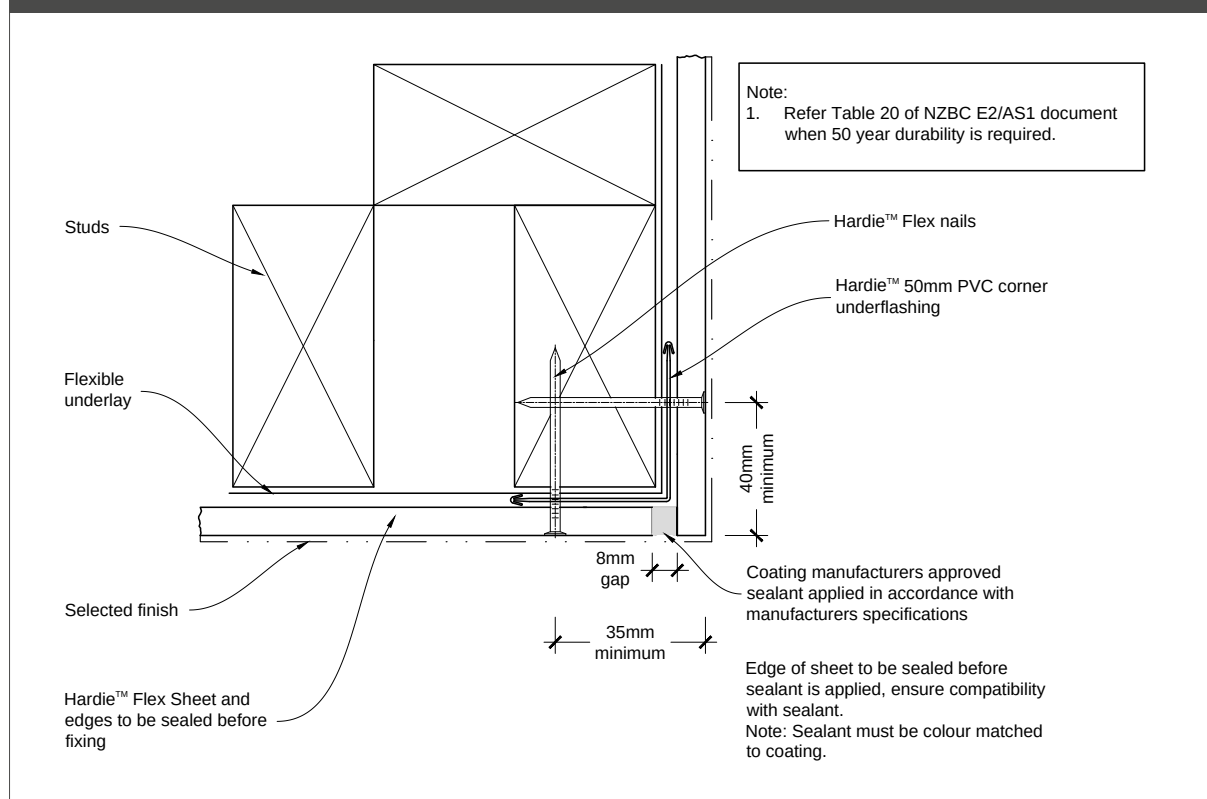




Figure 13: Direct fix horizontal control joint

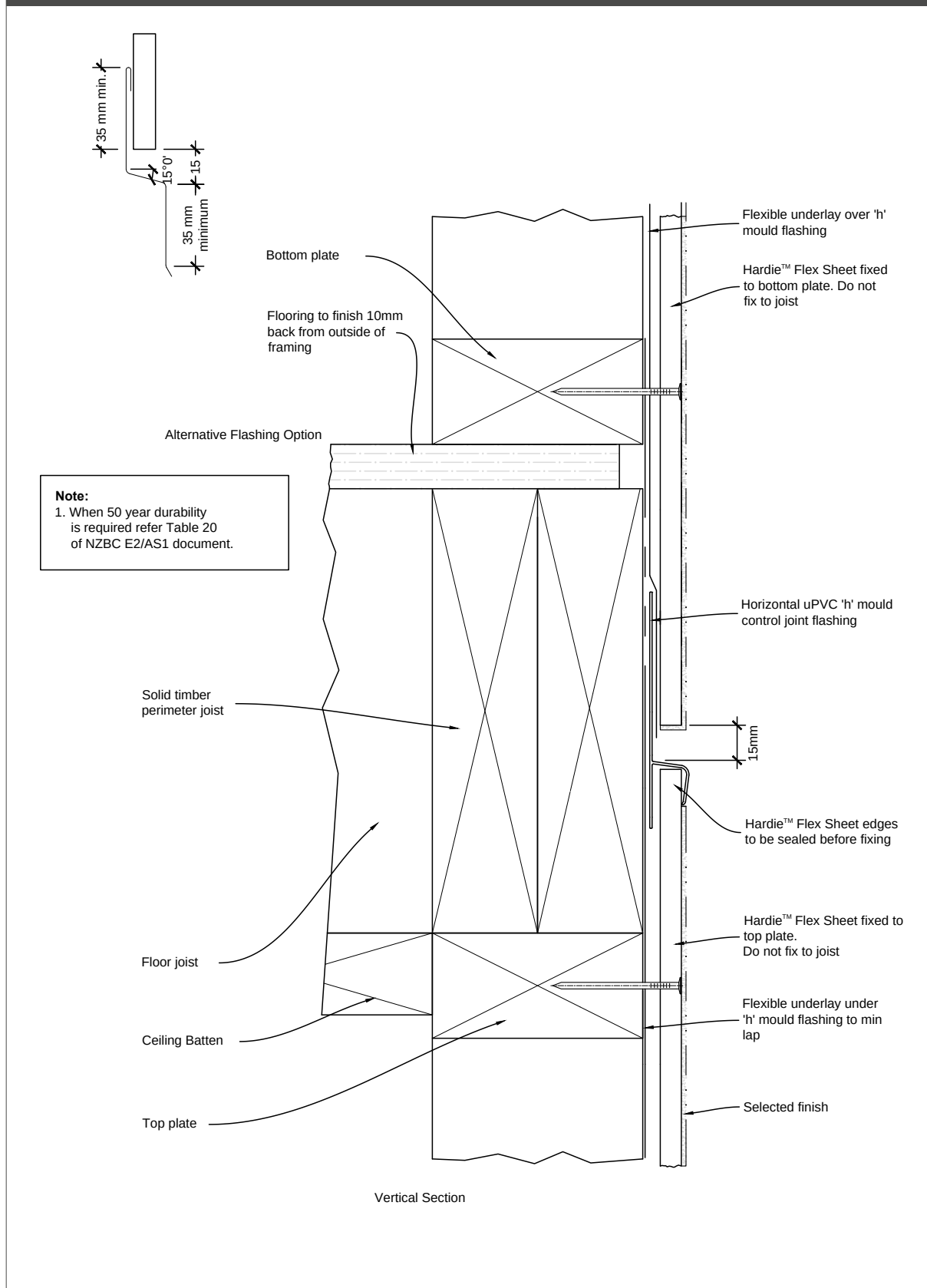




Figure 14: Direct fix soffit detail

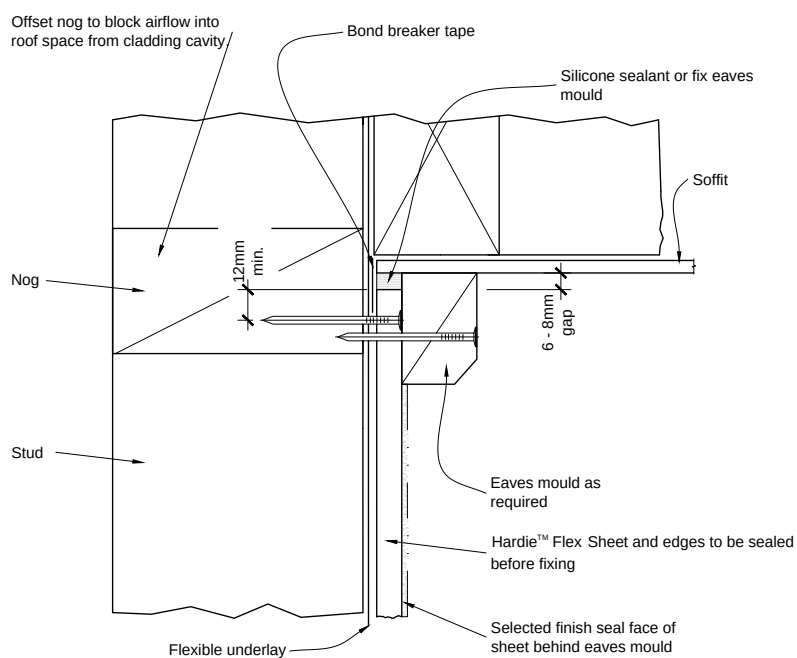


Figure 15: 'h' mould jointer

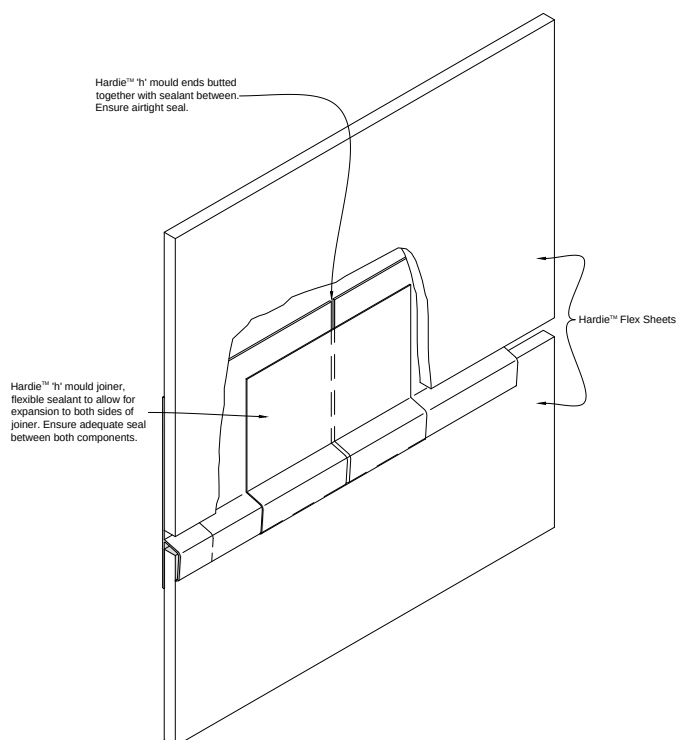
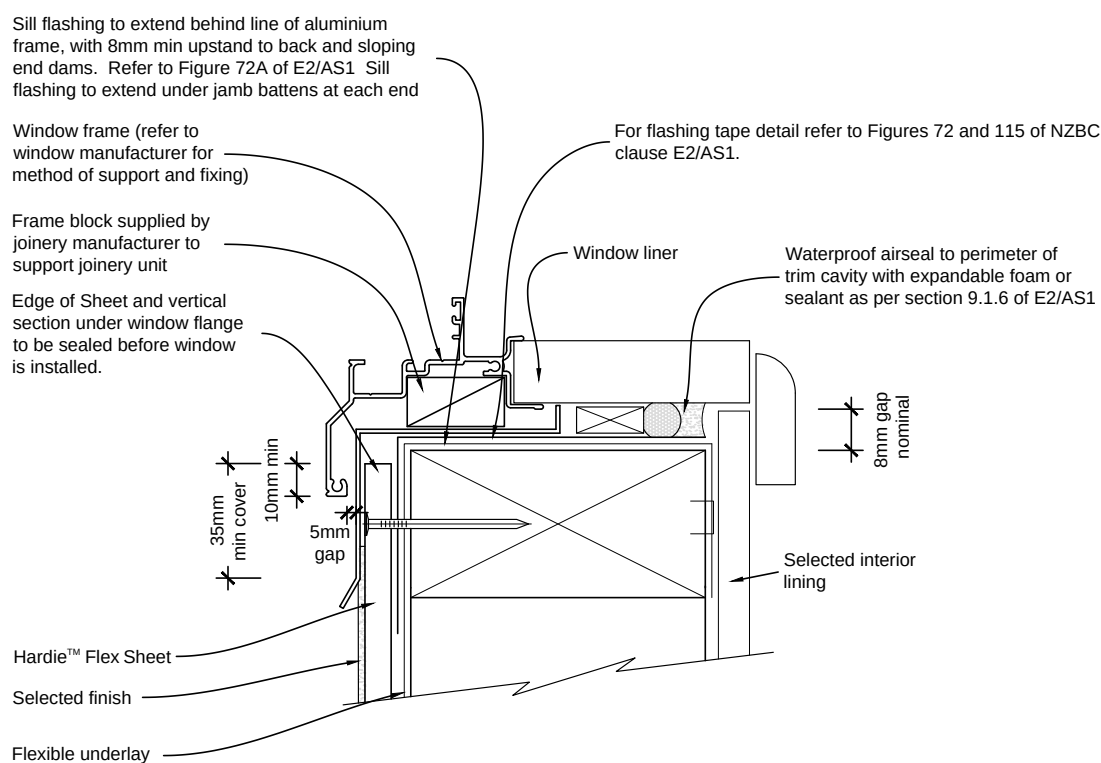


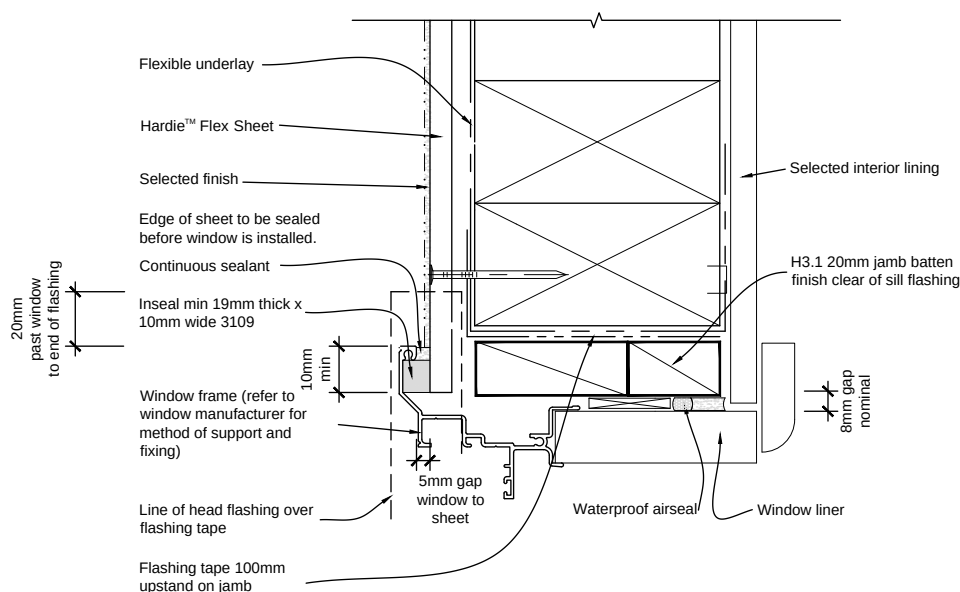
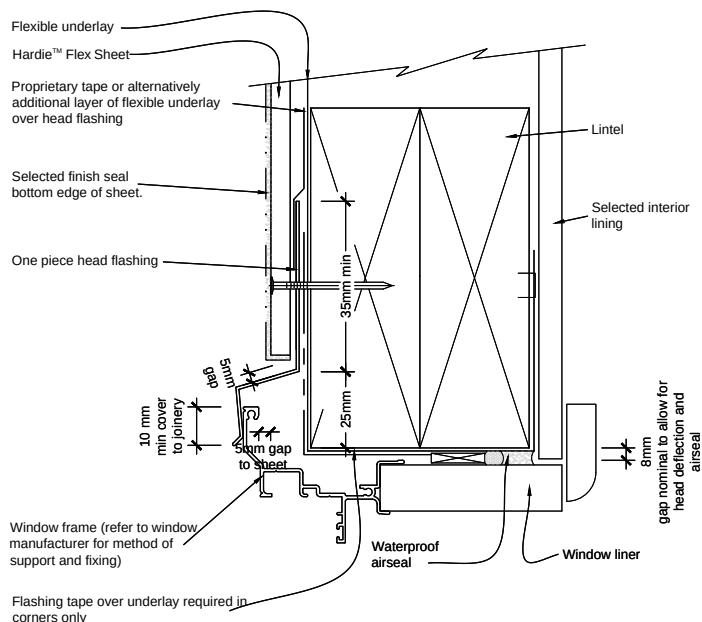


Figure 16: Direct fix window sill

**General notes for materials selection**

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1.
2. Flexible underlay must comply with acceptable solution E2/AS1 and NZS 3604.
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact as per Table 21 of E2/AS1.

Refer to the manufacturer or supplier for technical information for these materials.



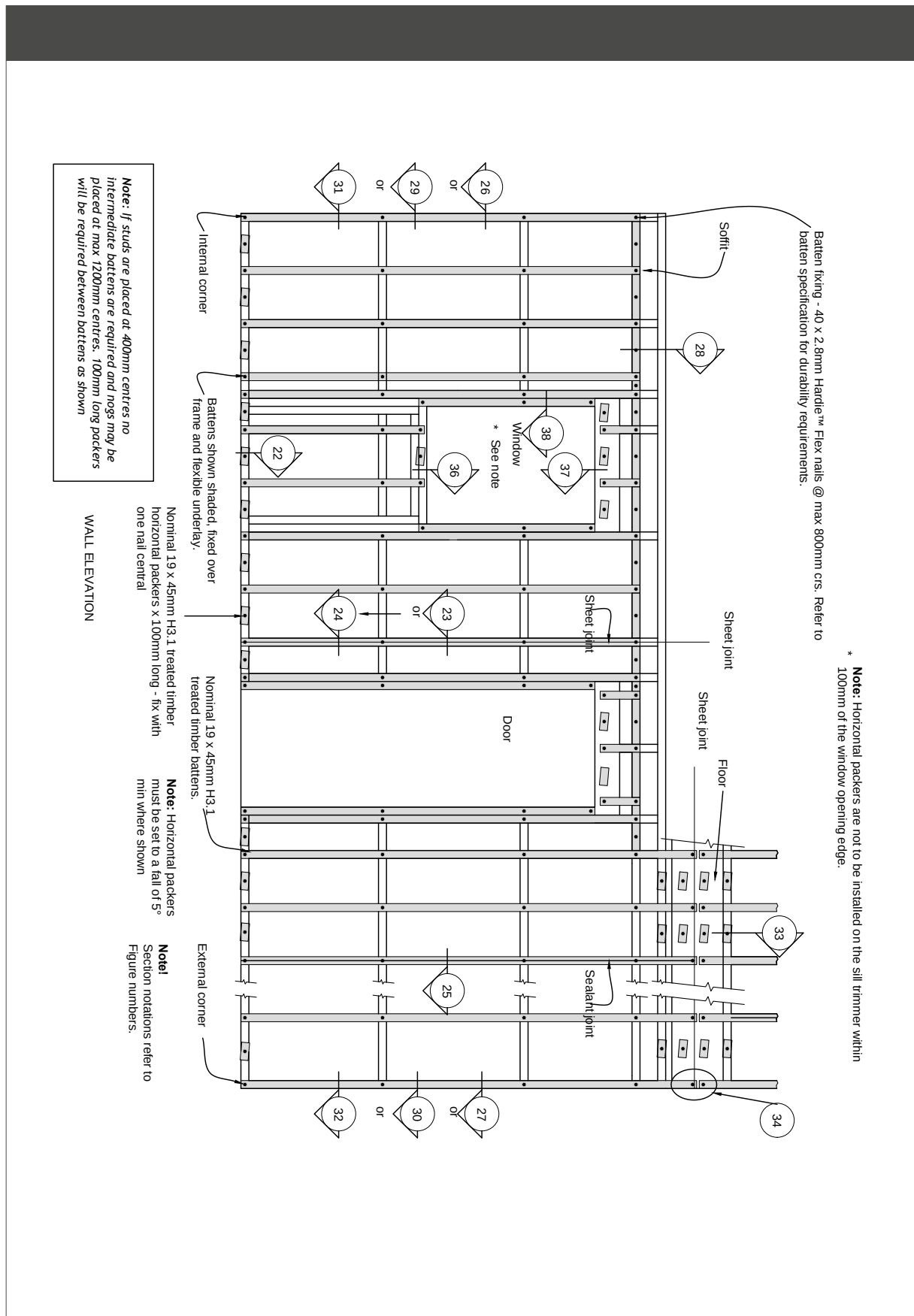
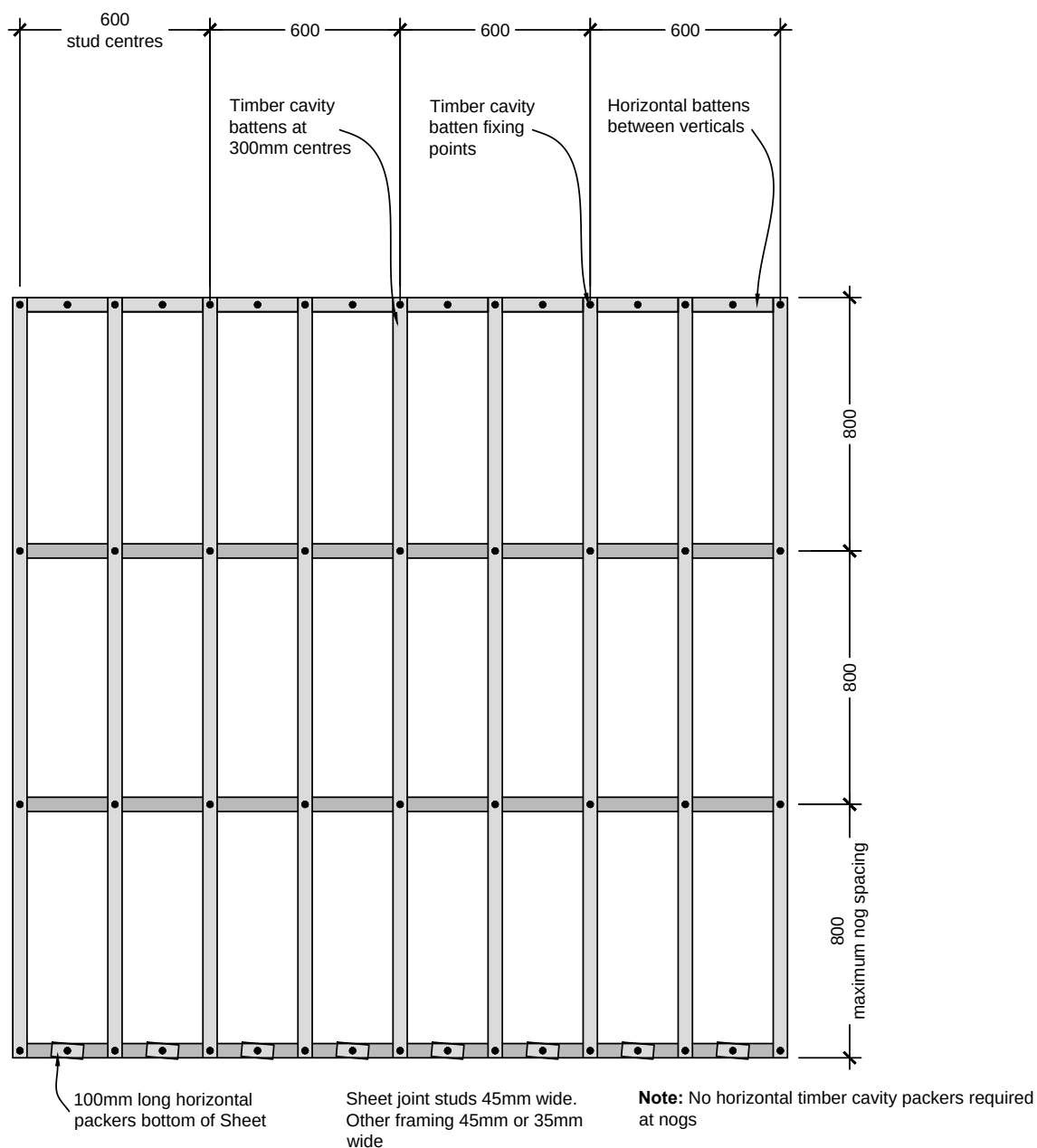




Figure 20: Cavity batten fixing



Note: Horizontal packers must be set to a fall of 5° minimum where shown

Note: If studs are placed at 400mm centres no intermediate battens are required and nogs may be placed at max 1200mm centres. 100mm long packers will be required between battens as shown

Figure 21: Cavity sheet fixing

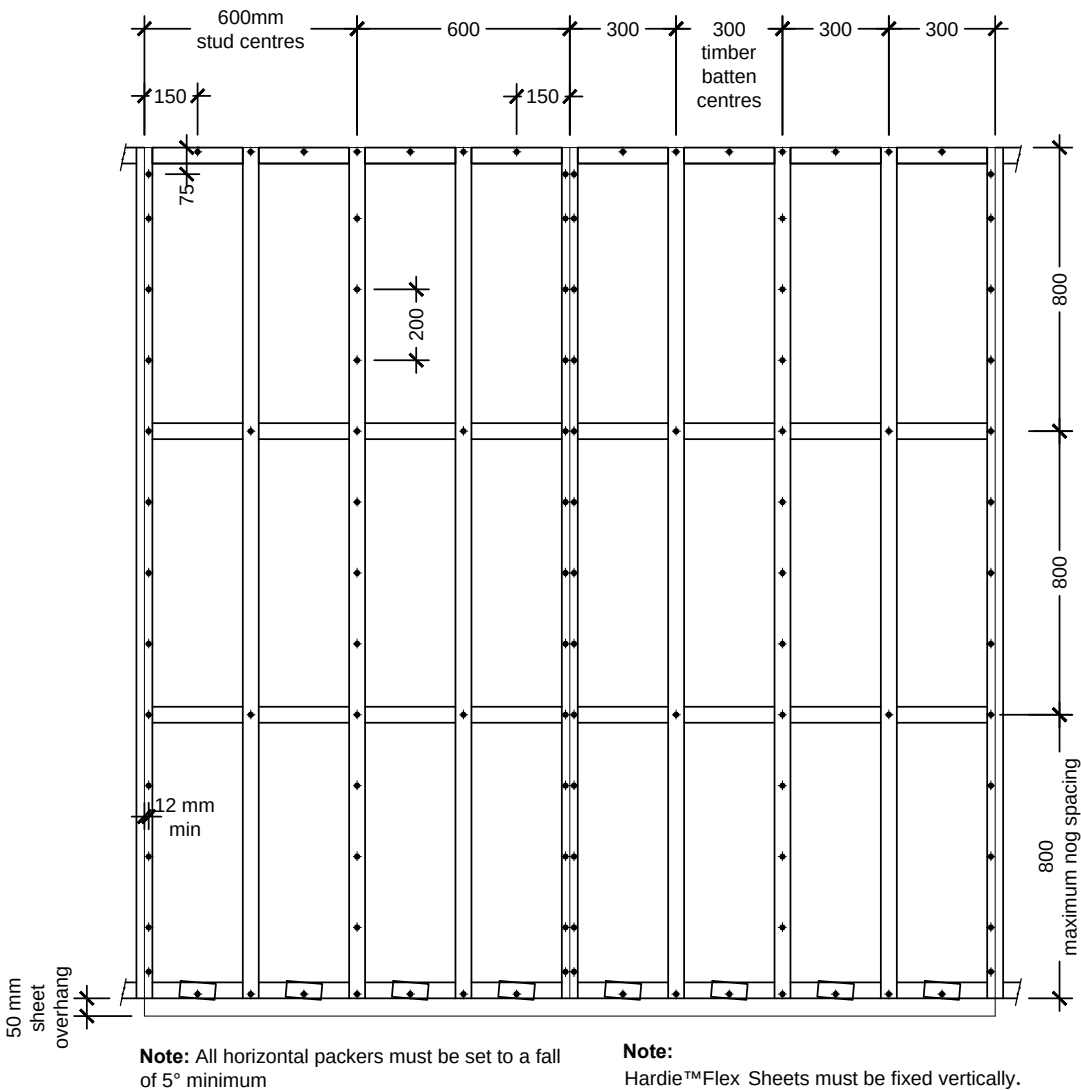


Figure 22: Cavity concrete foundation detail

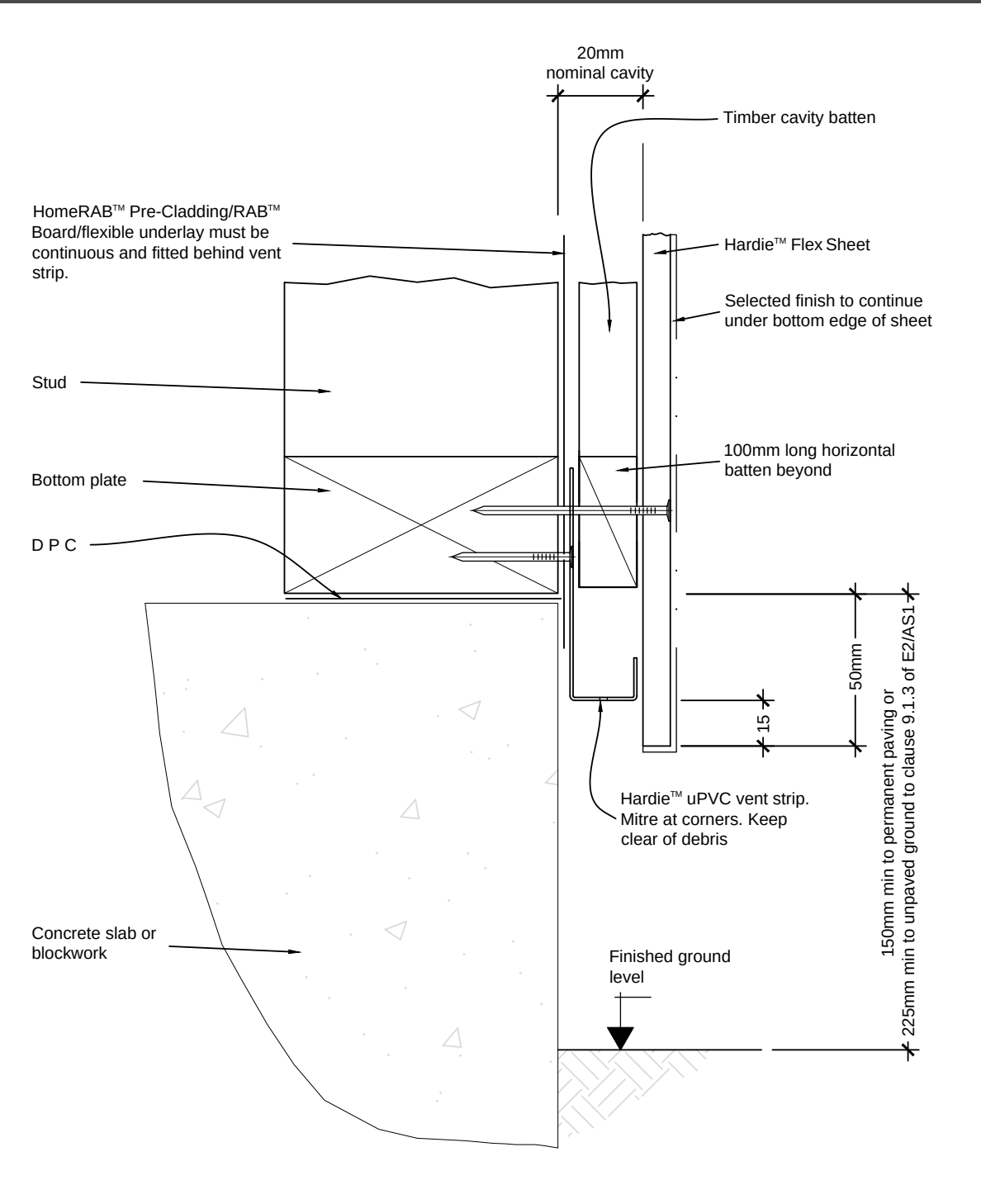




Figure 23: Cavity vertical uPVC joint

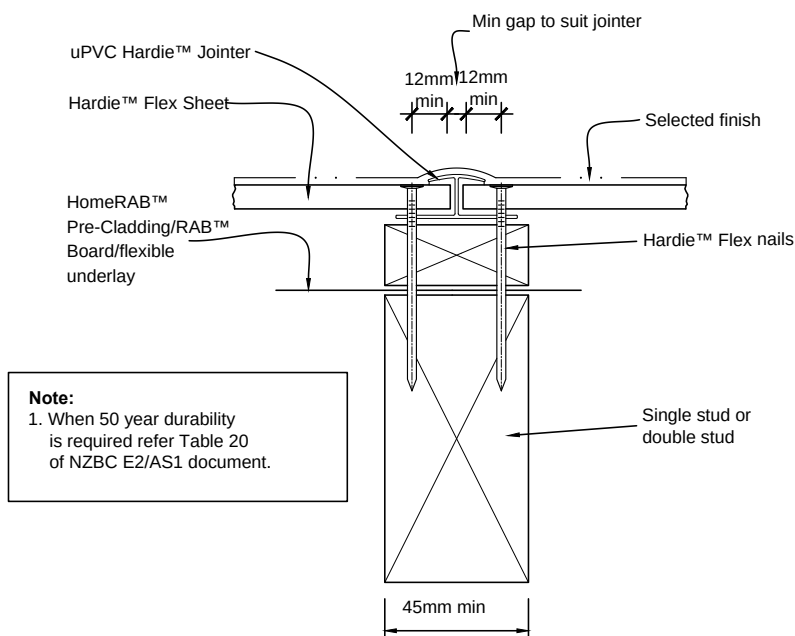


Figure 24: Cavity vertical timber batten joint

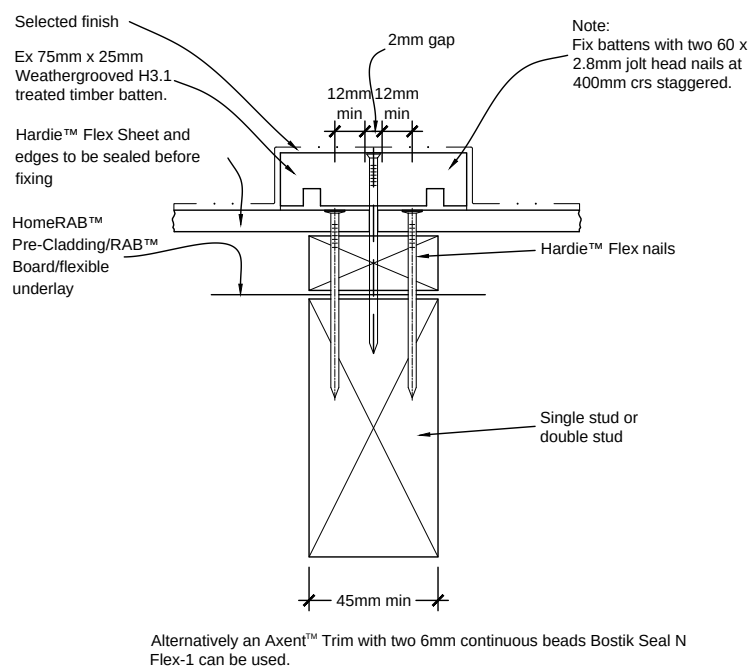




Figure 25: Cavity vertical sealant joint

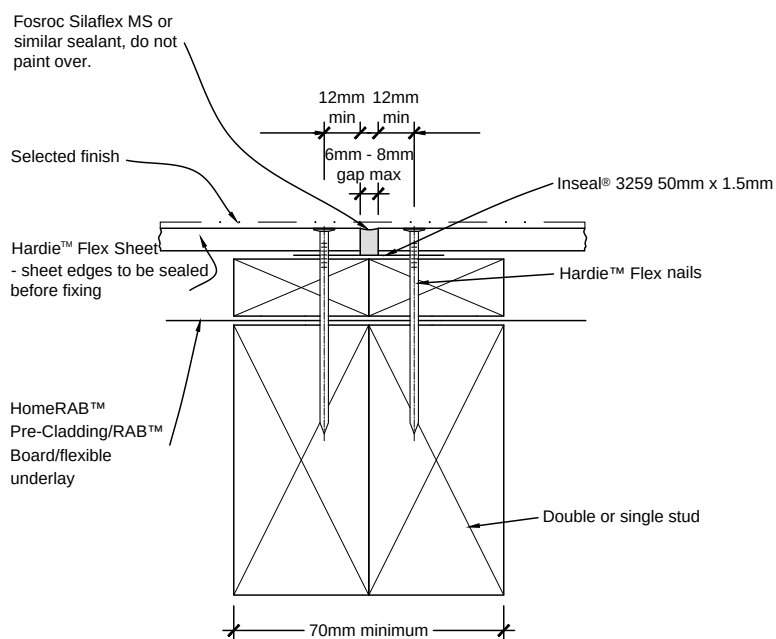
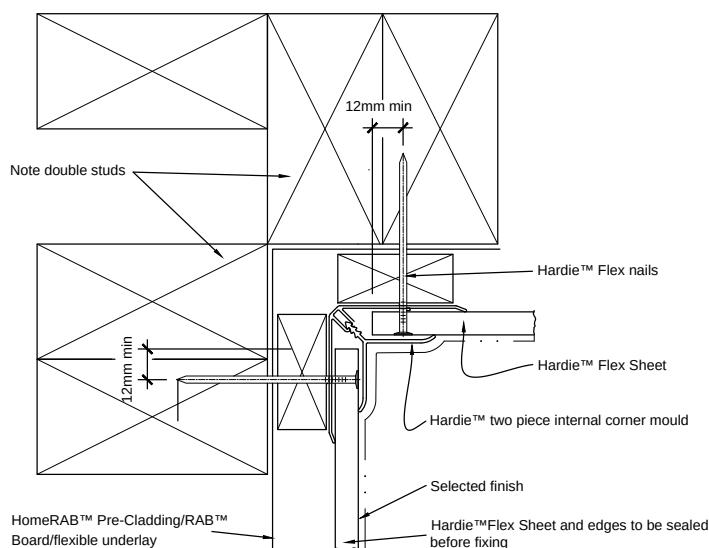


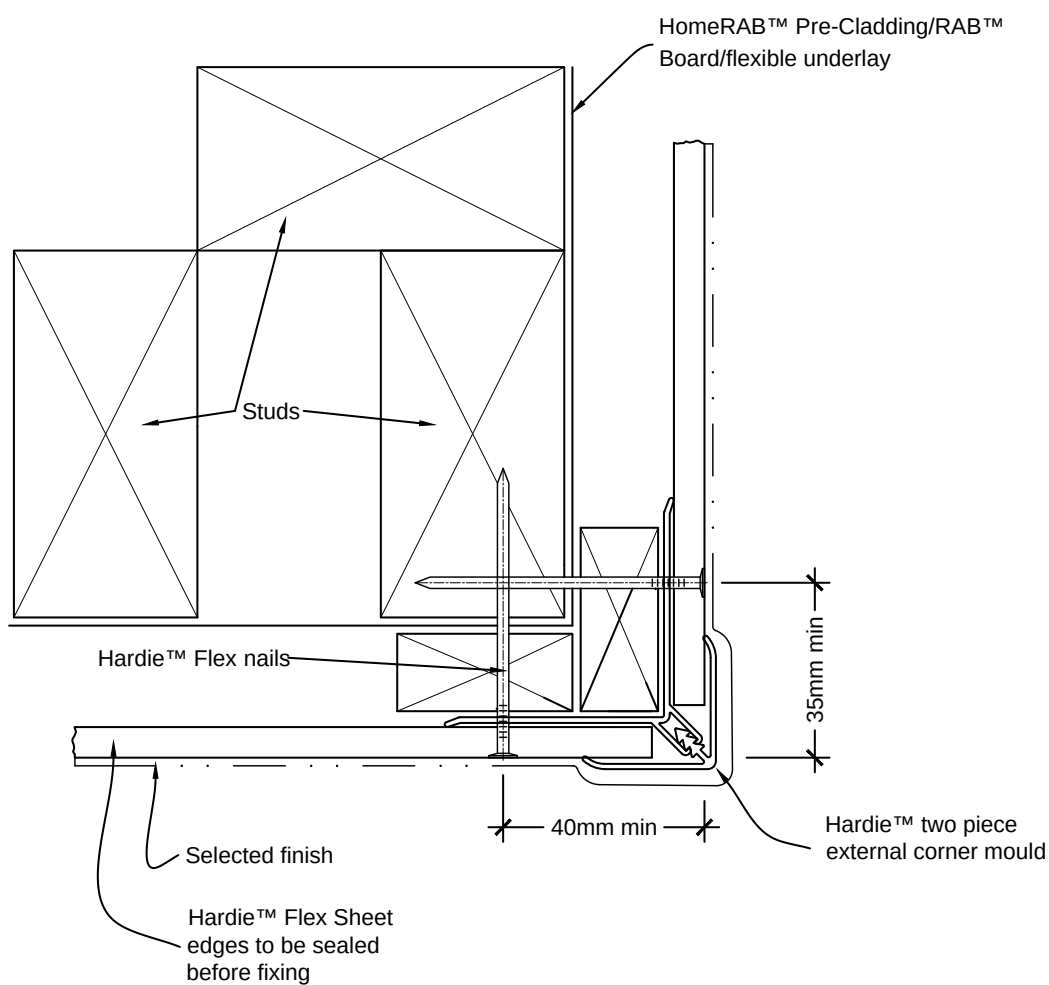
Figure 26: Cavity internal uPVC corner joint



Note:
1. When 50 year durability is required
refer Table 20 of NZBC E2/AS1 document.



Figure 27: Cavity external uPVC corner joint

**Note:**

1. When 50 year durability is required refer Table 20 of NZBC E2/AS1 document.



Figure 28: Cavity internal timber batten corner

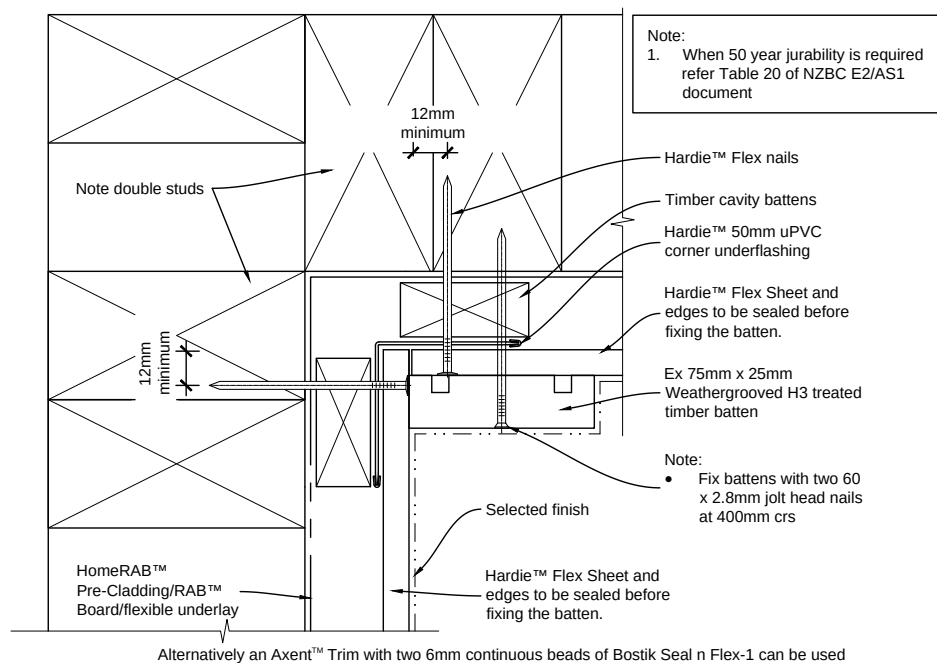


Figure 29: Cavity external timber batten corner

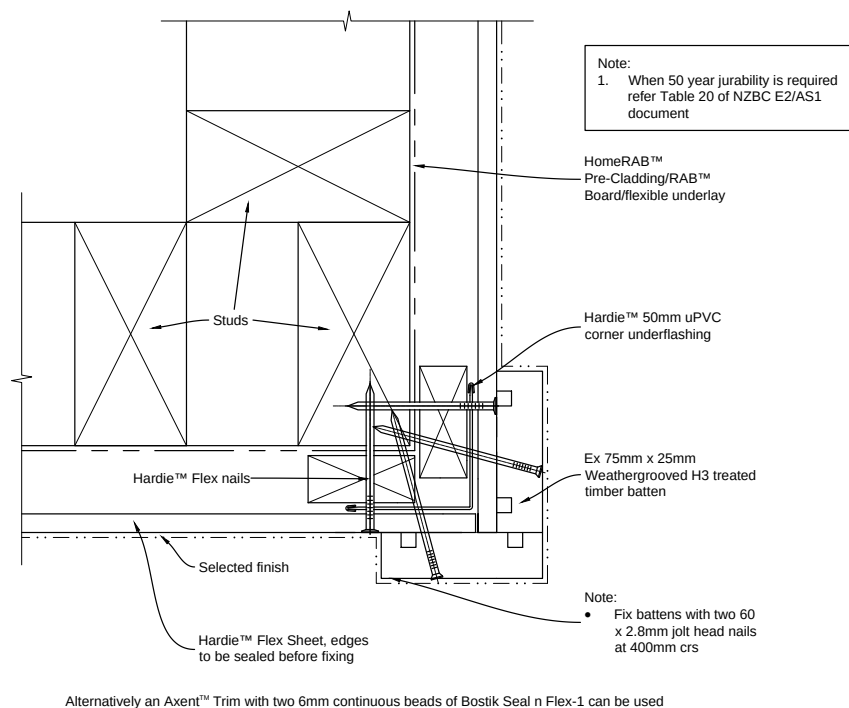




Figure 30: Cavity internal sealant joint corner

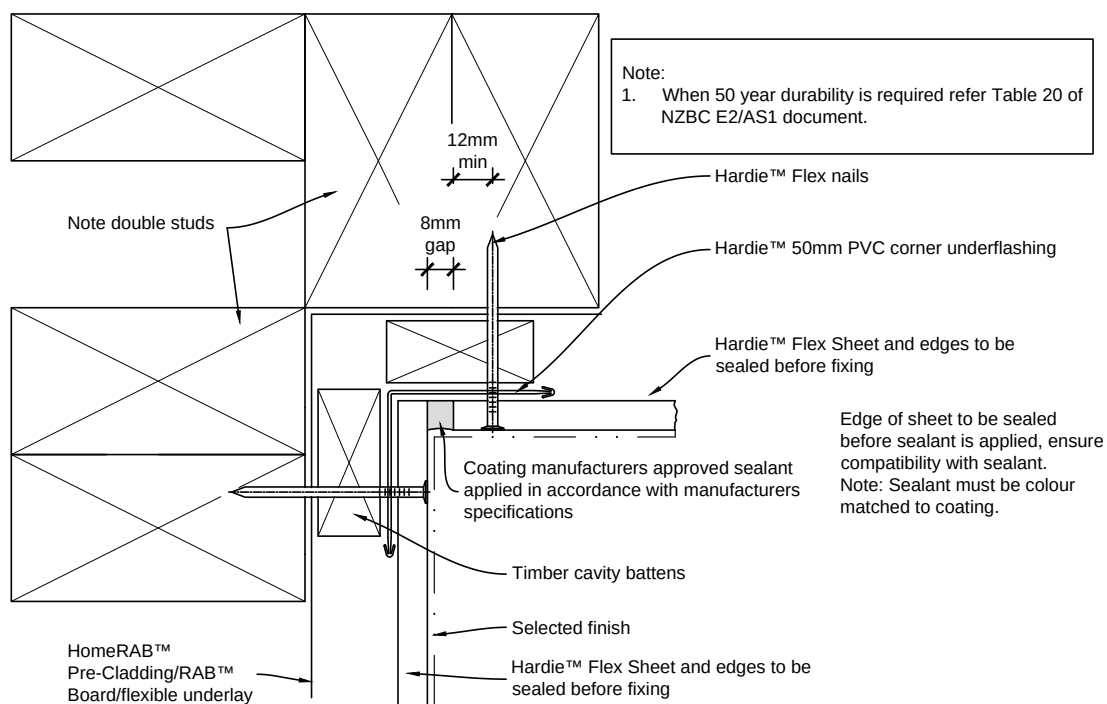
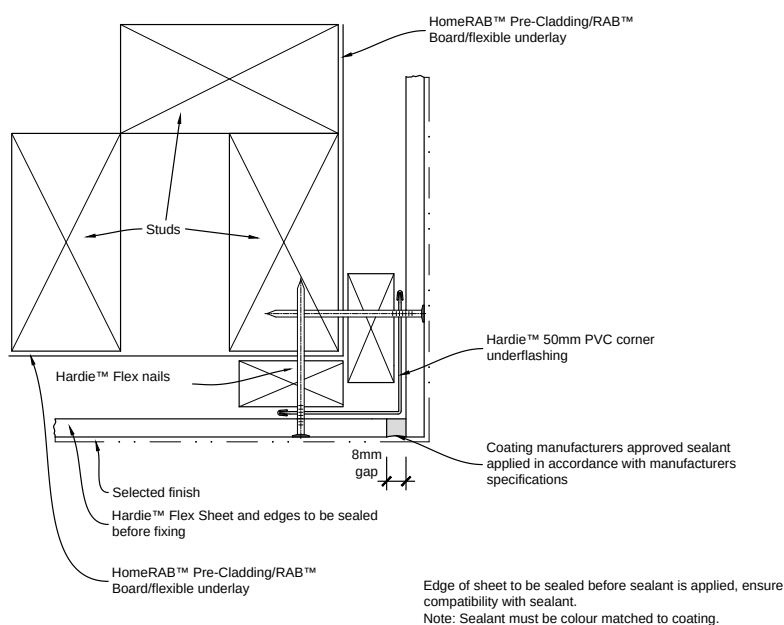


Figure 31: Cavity external sealant joint corner



Note:

- When 50 year durability is required refer Table 20 of NZBC E2/AS1 document.

Figure 32: Cavity soffit detail

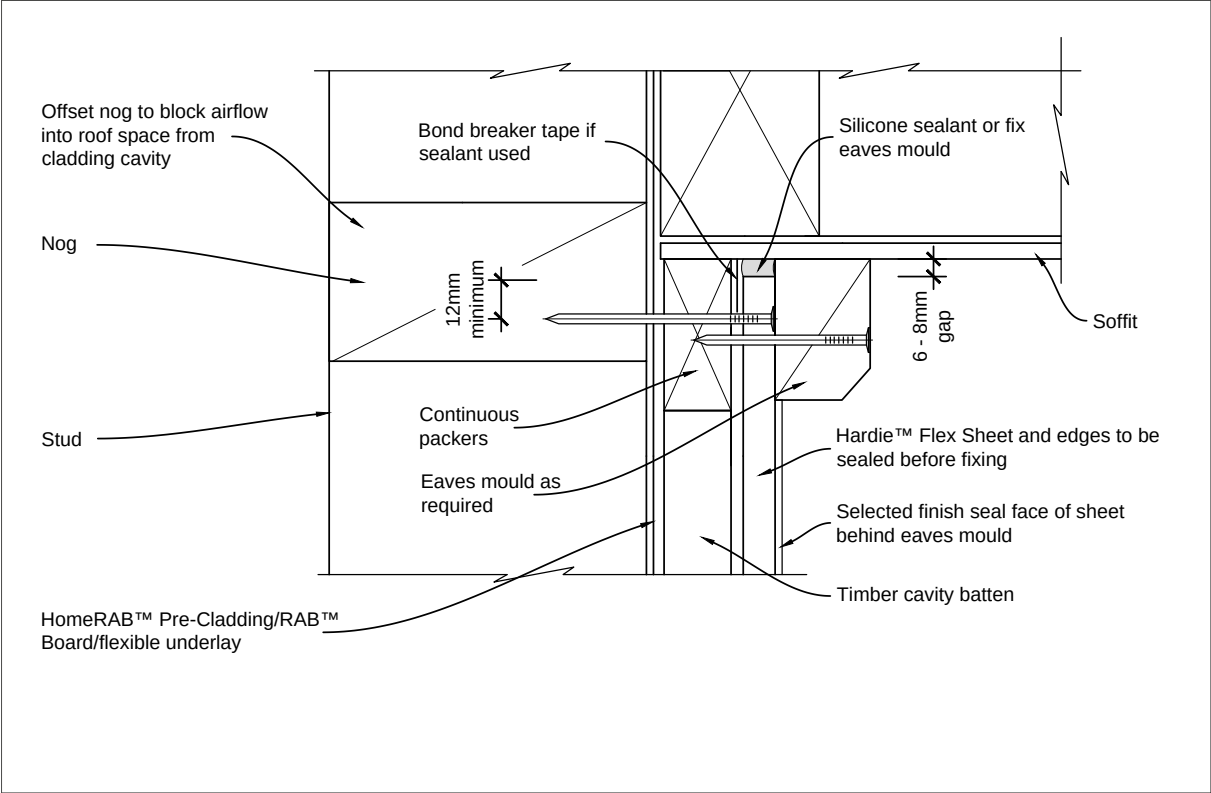




Figure 33: Cavity horizontal control joint

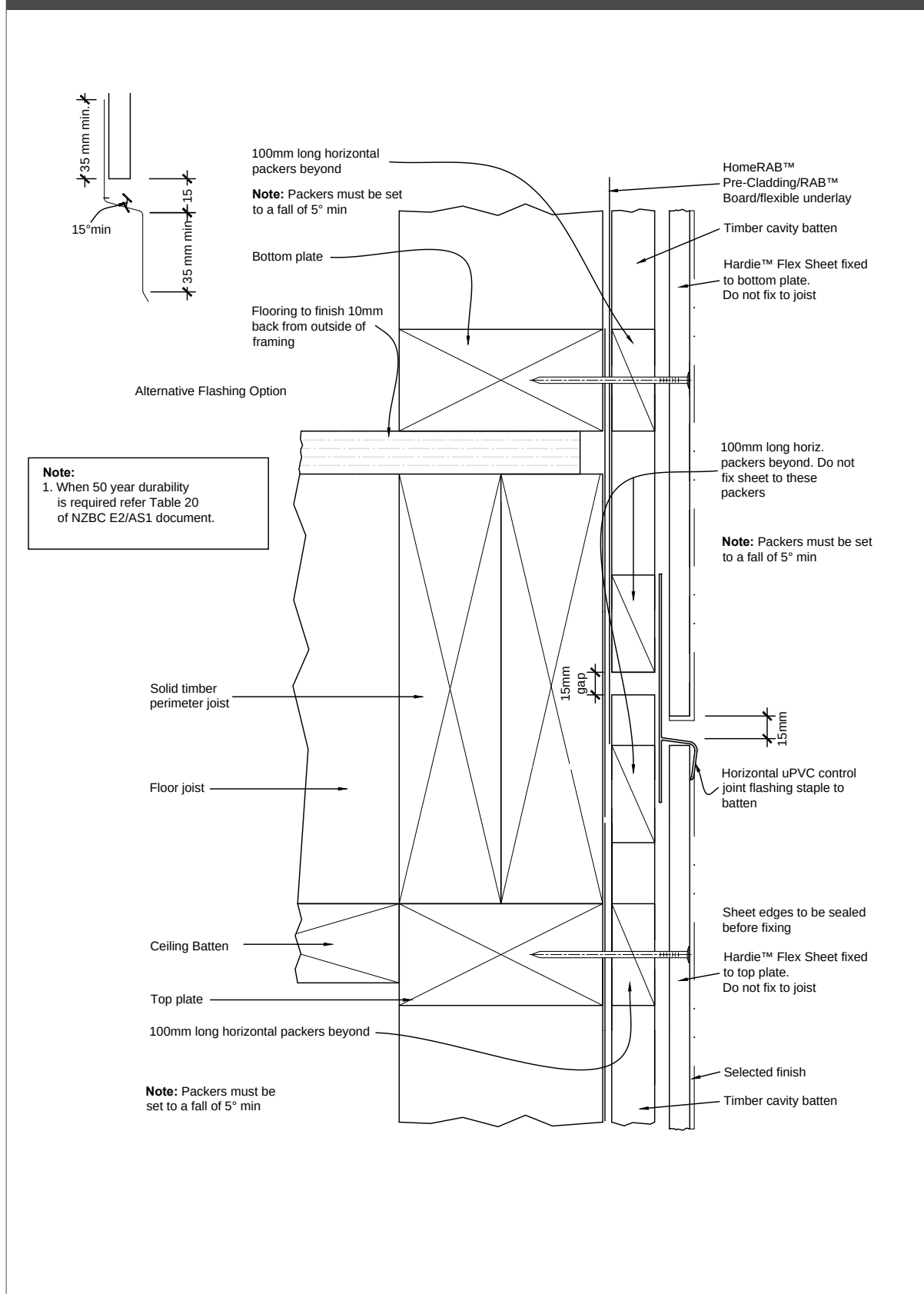




Figure 34: Cavity corner to 'h' mould joint

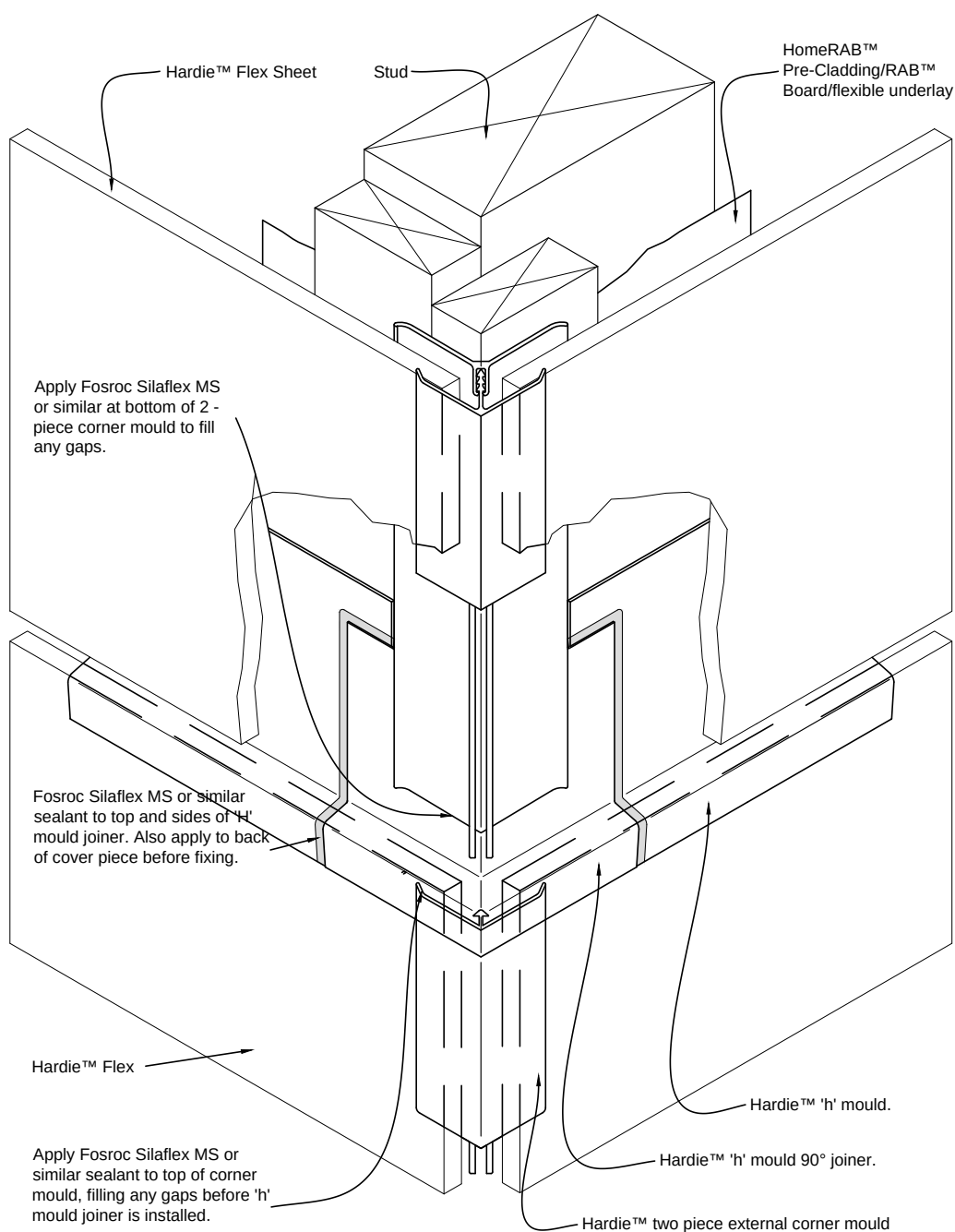
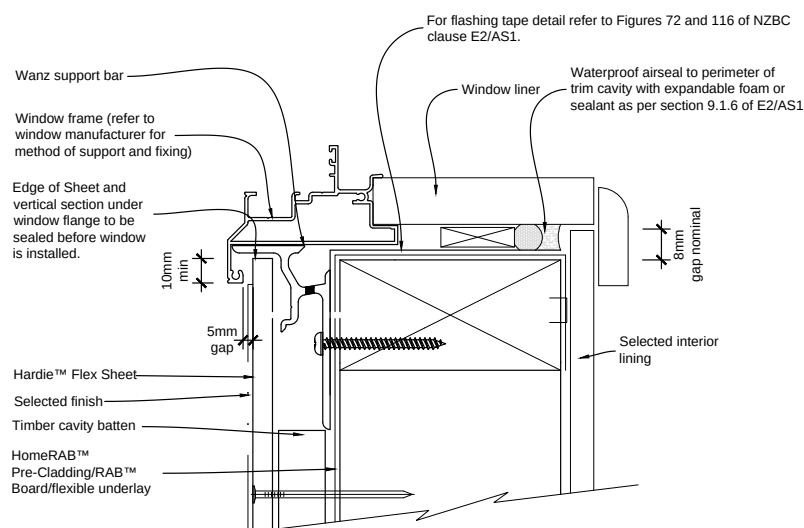




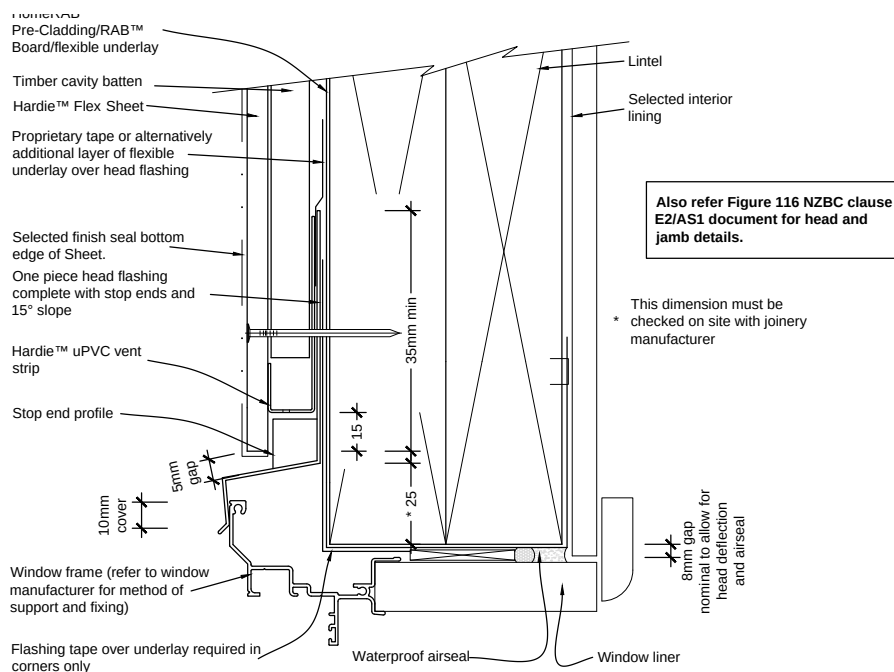
Figure 35: Cavity window sill

**General notes for materials selection**

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause 'E2/AS1'.
2. Flexible underlay must comply with acceptable solution NZBC clause 'E2/AS1' and NZS 3604.
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact as per Table 21 of NZBC clause 'E2/AS1'.

Refer to the manufacturer or supplier for technical information for these materials.

Figure 36: Cavity window head



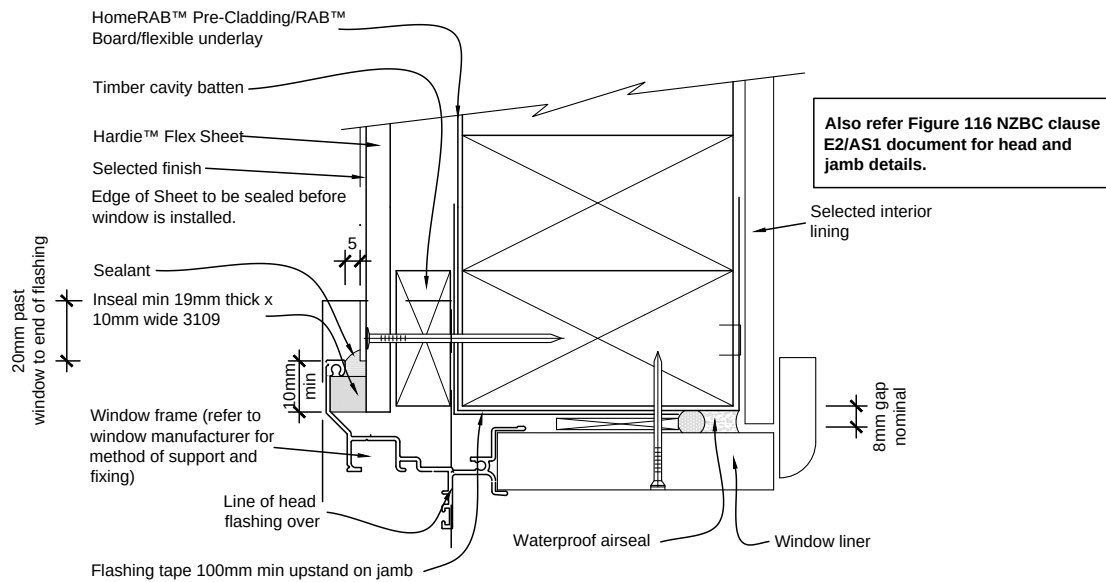




Figure 38: Cavity one piece apron flashing joint

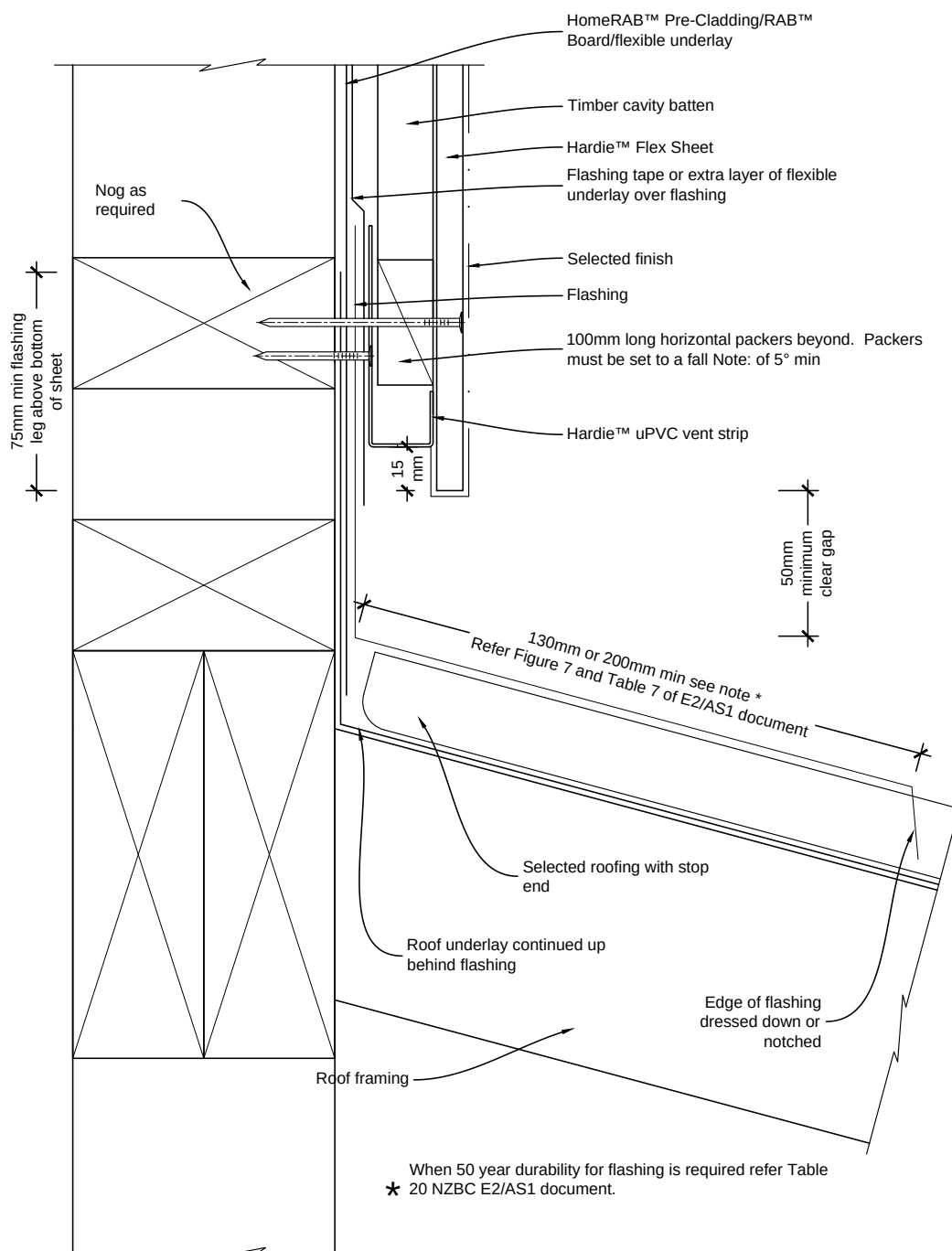




Figure 39: Cavity parapet flashing

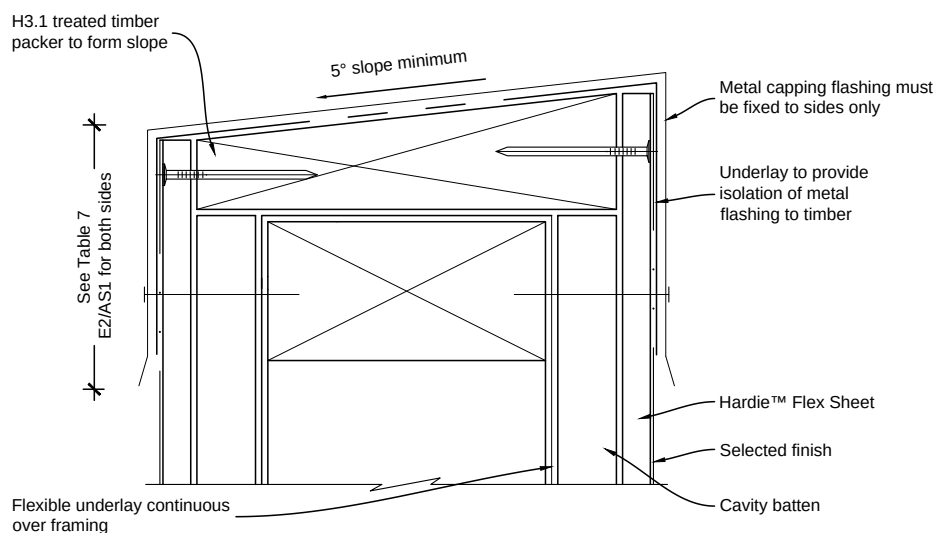
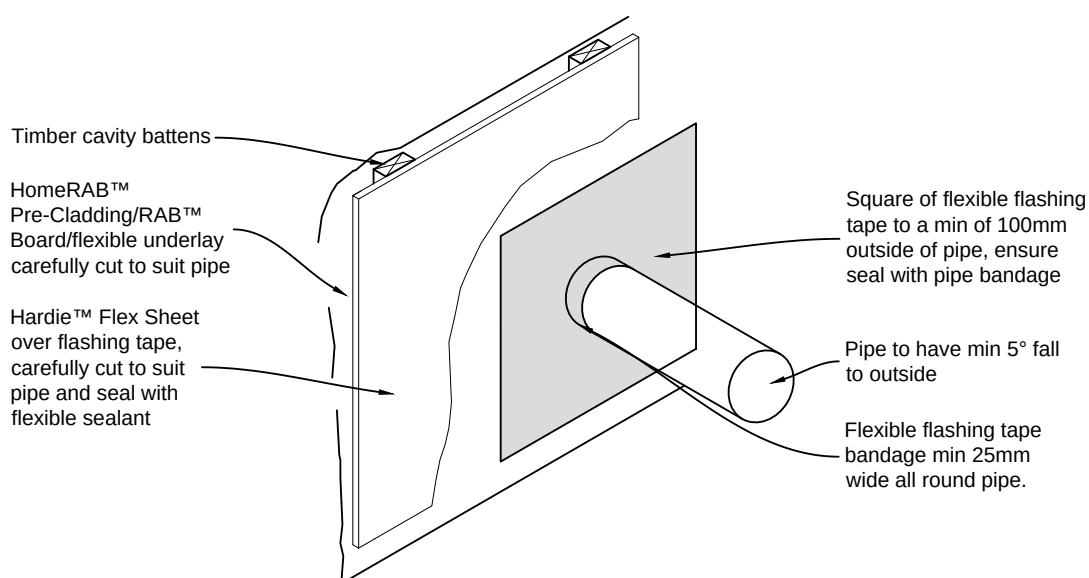


Figure 40: Cavity pipe penetration





Hardie™ Flex Sheet

Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 15 years from the date of purchase that the Hardie™ Flex Sheet (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

- a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
- b) This warranty is not transferable.
- c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.
- d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards.
- e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.
- f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).
- g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.
- h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of the Hardie™ Flex Sheet when installed in accordance with the Hardie™ Flex Sheet technical specification, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

© 2021. James Hardie New Zealand Limited. TM and ® denotes a Trademark or Registered Mark owned by James Hardie Technology Limited.



**Thermakraft™**
COVERTEK
403**Thermakraft**
ONE WRAP
SYSTEM10 Products - One system
One warranty

Thermakraft™ COVERTEK 403

Non self-supporting roof and wall underlay

Kingspan Thermakraft Covertek 403 is a fire retardant, light weight roof and wall underlay designed as a means of managing condensation, water vapour transfer and water ingress. Primarily developed as a roof underlay, Covertek 403 can also be used on walls if you are after a one stop solution. It is not self-supporting as a roof underlay and is a more affordable option where a supporting component is to be installed in the building.

Product Usage

Covertek 403 is a synthetic roof and wall underlay designed as a means of managing condensation, and water ingress in roof applications. Constructed using a microporous water-resistant film sandwiched between two layers of spun-bonded polyolefin Covertek 403 is fire retardant, absorbent and breathable.





Covertex 403

Non self-supporting roof and wall underlay



Roof Application Method

Residential:

Roof Long-run metal/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- Covertex 403 must be installed in a manner that prevents ponding of water.
- Covertex 403 must be fully supported by Roof Safety Mesh 300mm x 150mm, hexagonal netting or suitable strapping that satisfy the requirements of the MRM Code of Practice and NZBC.
- For roof pitches below 10°, Covertex 405 or 407 recommended.
- Covertex 403 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.

Note: Covertex 403 can move downwards. To prevent this, it must be "Captured" by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1200mm to allow for 150mm laps.

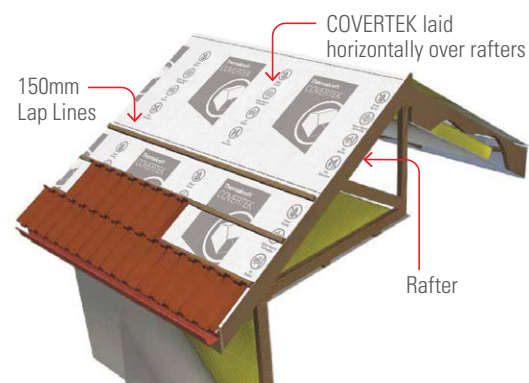
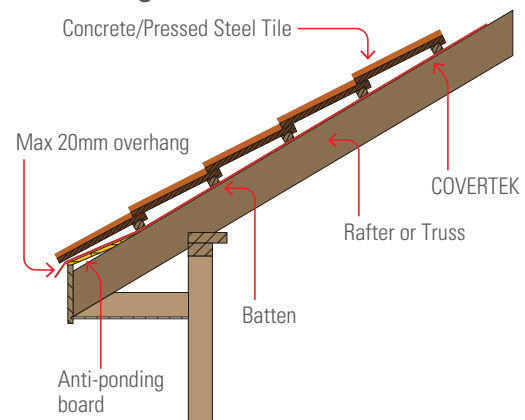
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- Covertex 403 will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended. DO NOT over expose the product for more than 7 days.
- Covertex 403 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Covertex 403 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Covertex 403 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the MRM Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Covertex 403 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Covertex 403 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

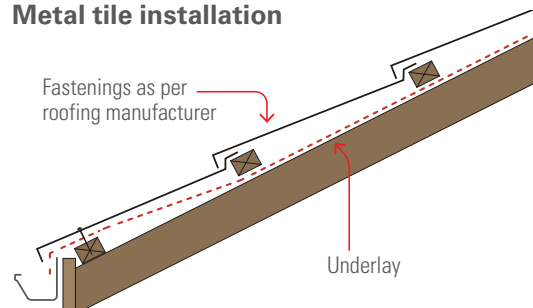
Concrete/Metal tile roofing

- Covertex 403 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Covertex 403 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1.
- Installed Covertex 403 may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with NZBC E2/AS1.
- Can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- Covertex 403 must be installed by a licensed building practitioner.

Tile roofing



Metal tile installation



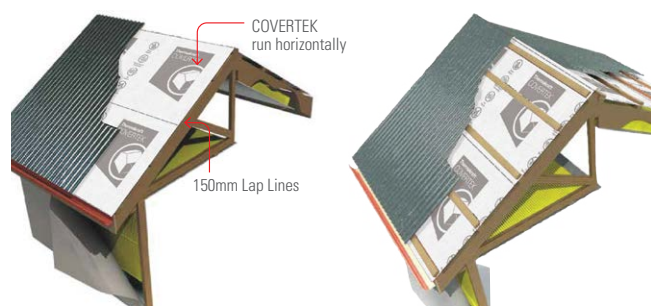


Covertex 403

Non self-supporting roof and wall underlay



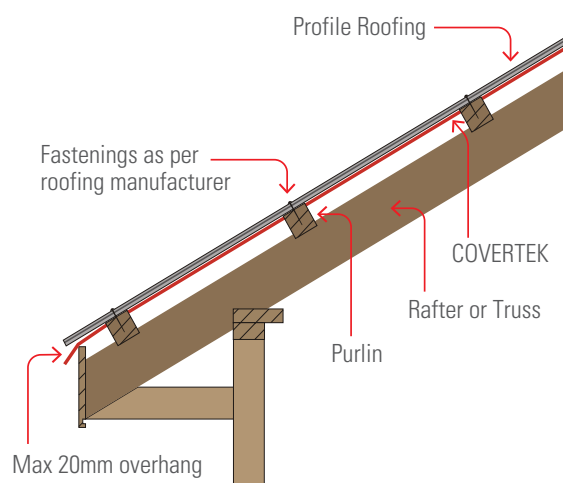
Corrugated roofing:



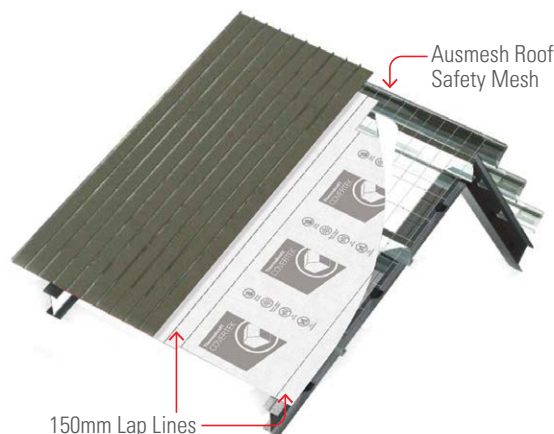
Covertex 403 can be direct fix or cavity fix and must be installed in a manner that prevents ponding of water and span no more than 1200mm.

Long run metal roofing:

Wooden construction



Steel construction



Wall Application Method

- Fix Covertex 403 underlay with printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Covertex 403 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the MRM Code of Practice.
- When fixing Covertex 403 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Covertex 403 underlay.
- It is recommended that the Covertex 403 underlay is not cut and prepared for window installation until the arrival of the windows. Minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Covertex 403 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
- NB. In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft Stud Strap or Thermastrap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Covertex 403 must not be left exposed to the weather or UV for a maximum of 42 days. Covertex 403 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.

Continued over...

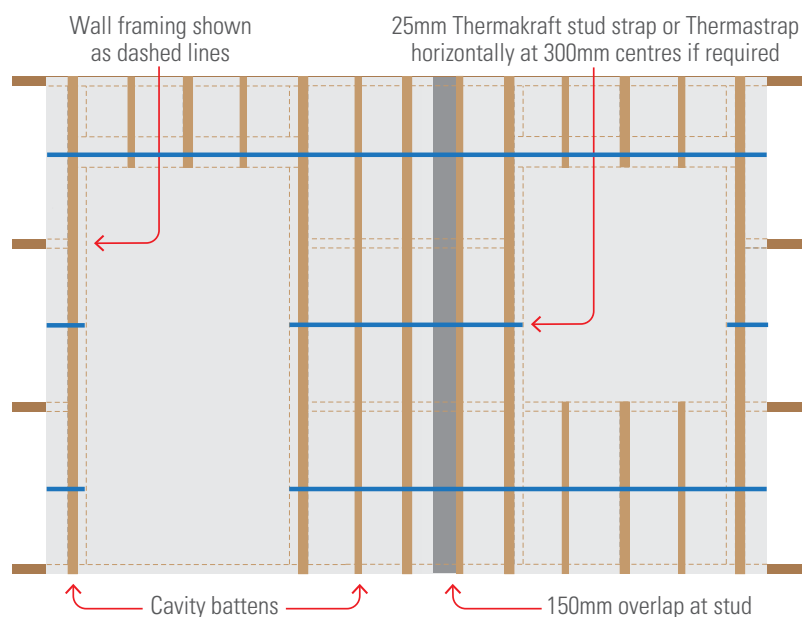


Covertex 403

Non self-supporting roof and wall underlay



- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Covertex 403 underlay must be installed by, or under the guidance of, a licensed building practitioner.



Application Tips

- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Handling and Storage

Covertex 403 must be handled with care to prevent damage such as tearing and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.



0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.



The recommendations contained in Kingspan's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Kingspan (for example quality of workmanship and design), Kingspan shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found online. E&OE.

BCO10364430 Received by Auckland Council 10/03/2023



IBS RigidRAP®

Installation Guide



MAY 2022



RigidRAP® - Installation Guide

Contents

1. Introduction	3	4. External Wall Wrap - Rigid Air Barrier	21
1.1 What is IBS RigidRAP®?	3	4.1 Scope of Use	21
1.2 What is a Rigid Air Barrier?	3	4.2 Non-Structural Rigid Air Barrier	21
1.3 Benefits of IBS RigidRAP®	3	5. Temporary Weather Cladding	21
1.4 IBS RigidRAP® Intended Use	3	5.1 Scope of Use	21
1.5 Supporting Information	3	6. Further Information	21
2. Best Practice	4	6.1 What is OSB3?	21
2.1 Designer/Installer Skill Level	4	6.2 What is wall underlay?	21
2.2 Health and Safety	4	6.3 IBS RigidRAP® CodeMark explained	21
2.3 Sawing, Drilling, Shaping	4	7. Additional Resources	22
2.4 Installing Service Penetration	4	8. Available Details	22
2.5 Installing Window Opening	4	9. Limitations	22
2.6 Handling and Storage	5	10. Frequently Asked Questions	22
2.7 Finishing	5	11. CodeMark	23
2.8 Quality Assurance	5		
3. External Wall Bracing	6		
3.1 Scope of Use	6		
3.2 Limitations	6		
3.3 IBS RigidRAP® Wall Bracing System	7		
3.4 IBS RigidRAP® Bracing Capacity	8		
3.5 Top Plate to Rafter or Truss Connections	13		
3.6 Lintel Tie Down Details	14		
3.7 Fixings	15		
3.8 Mechanical Connections	20		
3.9 Joint Sealing and Window Tape	20		

NZBN 9429000097253

IBS RigidRAP® Product Details			
L x W x Thickness (mm)	Weight (kg)	IBS Product Code	GTIN
2440 x 1196 x 8	16	RRAP082412	09421028769716
2745 x 1196 x 8	18	RRAP082712	09421028769723
3050 x 1196 x 8	21	RRAP083012	09421028769730

Contact us for more information or to talk to our team.

www.ibs.co.nz | 0800 367 759 | info@ibs.co.nz



1. Introduction

This document is intended for designers and installers to ensure that IBS RigidRAP® (Rigid Air Panel) is specified and installed correctly.

1.1 What is IBS RigidRAP®?

IBS RigidRAP® is an 8mm OSB3 (Oriented Strand Board) which has been manufactured specifically for New Zealand, for use as a bracing element and/or rigid air barrier. IBS RigidRAP® is the only dual layer rigid air barrier system available in New Zealand and comes laminated with a watertight wall underlay.

It gives your house dual protection from the weather during your building process and replaces traditional building wrap. When compared to similar products it is more cost effective, easy to install and is lightweight.

As an OSB3 panel manufactured in accordance with EN13986:2004, it is suitable for use in humid conditions where the panel in-service moisture content does not exceed 20%. Compliance with the NZ Building Code (NZBC) is established through product certification (CodeMark). IBS RigidRAP® meets all the requirements of Table 23 (clause E2 - external moisture) from the compliance document for the NZ Building Code.

1.2 What is a Rigid Air Barrier?

A rigid air barrier is an underlay which acts as a barrier against air pressure and water infiltration from the outside to the inside of the building. They are easy to install, durable and is a solid substrate for the installation of flashing tape to window and door openings and exterior penetrations.

1.3 Benefits of IBS RigidRAP®

As designers, builders and homeowners move towards more sustainable and durable materials and systems, the benefits of IBS RigidRAP® are becoming more relevant.

Key Attributes and Benefits

- Reduces building time
- Lightweight material, simple and easy to install
- Provides rapid moisture protection of the building
- Allows for interior construction to continue
- Provides a greater level of site security
- Reduces structural timber movement
- Provides a rigid structure
- Provides weather tightness for the building.

1.4 IBS RigidRAP® Intended Use

Intended use for IBS RigidRAP® are:

1. External wall bracing
2. External wall wrap - rigid air barrier
3. Temporary weather cladding.

Read the following sections for more information on each intended use.

1.5 Supporting Information

This document must be read in conjunction with the:

- IBS Product Specification for IBS RigidRAP®
- IBS Maintenance and Warranty for IBS RigidRAP®

CAD details and all other information is available at www.ibs.co.nz.



2. Best Practice

2.1 Designer/Installer Skill Level

Where IBS RigidRAP® is specified and/or installed, the designer/installer shall have the appropriate skills and knowledge of the product and access to all IBS RigidRAP® technical information.

Visit www.ibs.co.nz for more information.

2.2 Health and Safety

When installing IBS RigidRAP® take all steps to ensure your safety and the safety of others;

- Ensure that when cutting or drilling IBS RigidRAP® that there is adequate ventilation or mechanical dust extraction
- Ensure IBS RigidRAP® is well supported when cutting or drilling the panel
- Appropriate close fit clothing shall be worn at all times
- Wear eye, ear and footwear protection when working with IBS RigidRAP®.

Site considerations:

- Selection of the right equipment for working from a height
- Safe working with ladders and stepladders
- Maintain a clear unobstructed work area.

For further information, refer to:

- The Absolutely Essential Health and Safety Toolkit
- Worksafe New Zealand Quick Guide.



2.3 Sawing, Drilling, Shaping

IBS RigidRAP® panels may be sawn and shaped in the same way as solid wood, although carbide tipped cutters are recommended.

If panels are to be installed in a visible location, ensure clean-cut edges with sharp tools, using a backing block to minimize break out. The feed rate shall be slower than for solid wood.

2.4 Installing Service Penetration

Service penetrations must be sealed using a flexible flashing tape. Refer to IBS RigidRAP® approved selection of flexible flashing tapes.

Flashing of pipe and service penetrations must be carried out in accordance with the following:

- Pipe penetrations through IBS RigidRAP® must have a minimum of 5° slope to the outside
- Flexible flashing tape must be installed like a bandage with a minimum of 25mm cover around the pipe and 100 mm minimum surface adhesion to IBS RigidRAP® panel surrounding the penetration.
- A hole 100 x 100 mm maximum within an envelope of 100mm from top and vertical edges and 200mm from the bottom of the IBS RigidRAP® panel will not affect the bracing capacity. Multiple holes of this size are permitted provided the centre lines of the holes are not closer than 600 mm.
- One hole of up to 400mm by 400mm located between the studs and within the envelope defined above, with nogging framing the hole and fixing of the OSB to the framing as per the requirements for the top and bottom plate is acceptable.

2.5 Installing Window Opening

Refer to IBS RigidRAP® approved selection of flexible flashing tapes.

Flashing window openings must be carried out in accordance with WANZ Guide to E2/ASI (6), substituting building wraps for IBS RigidRAP®.

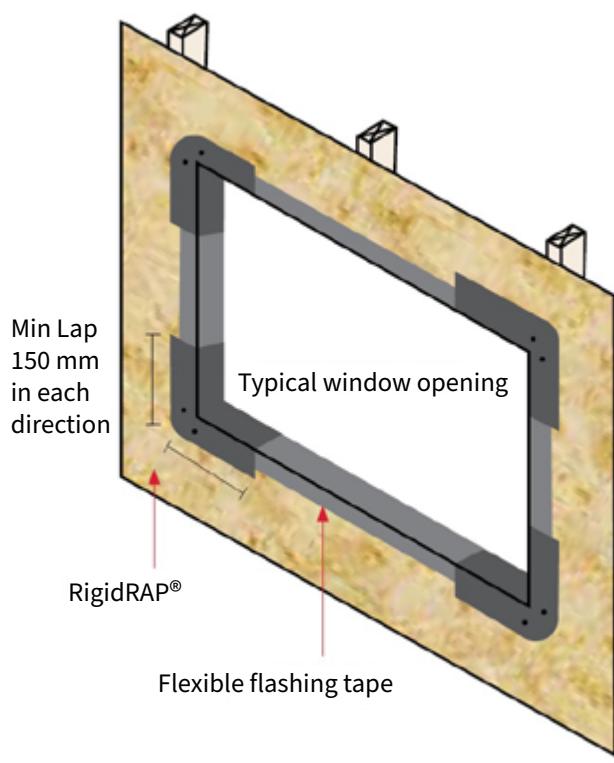
- Cut the flashing tape for the sill at least 200mm wider than the opening.
- Fit the tape with the inner edge of the tape flush



with the inside line of the framing and extend 100mm up and down each jamb edge.

- Ensure the tape is well adhered to the surfaces and fitted tightly to each corner.
- Fully tape all window opening edges.

NOTE: All window tapes shall be used in accordance with the manufacturer's installation guide.



Correct storage and handling in transport is essential for the protection of IBS RigidRAP®. The following simple principles shall be considered:

- Strapping and shrink wrap shall be removed immediately upon arrival at the installer's storage area or on site.
- IBS RigidRAP® shall be laid flat on timber bearers. The spacing between the timber shall be no more than 800mm.
- Ensure the storage bearers are in true alignment if several pallets are stacked on top of each other.
- When stored outside, ensure there is sufficient clearance between the ground and IBS RigidRAP® to prevent moisture transfer and allow air circulation. Cover with a waterproof tarpaulin.
- IBS RigidRAP® must not be exposed to the weather for more than 90 days.
- When manually handling IBS RigidRAP® ensure the

panels are lifted in the central third.

- IBS RigidRAP® shall be allowed to acclimatise to the site conditions for 48 hours prior to installation.

IBS RigidRAP® shall not be exposed to the weather or ultraviolet light for more than 90 days during construction.

2.7 Finishing

A 20 mm ventilated cavity and the cladding/joinery system must be installed so that it complies with the NZ Building Code. Installation of the cavity, cladding, joinery etc must be in accordance with the relevant supplier and in accordance with the Building Consent, where applicable.

2.8 Quality Assurance

IBS recommends that installers record the installation of IBS RigidRAP®. This may include:

- packing slips to show evidence of delivery
- written notes, and
- meaningful photos.





3. External Wall Bracing

3.1 Scope of Use

IBS supply IBS RigidRAP® for use as an internal or external wall bracing element when used in conjunction with a specific fixing system.

IBS RigidRAP® may be used as a bracing element within the following scope:

In wind zones:

- Up to and including extra high.
- Up to 2.5kPa ULS where the building is specifically engineered.

Building scope

- New buildings: with timber wall framing complying with NZBC.
- In conjunction with the GIB HandiBrac® method or a Strap Bracing system.
- In conjunction with LVL System - staples, Mitek CPC 80 and SPAX screws.
- In conjunction with LVL System - staples, Simpson Strong-Tie DTT2Z and type 17 screws.
- In conjunction with concrete and timber subfloor applications that comply with the NZBC.
- With all cladding types that comply with NZBC.
- In conjunction with a drained and ventilated nominal 20mm cavity system.
- With aluminium joinery complying with the NZBC.
- IBS RigidRAP® may be used as a bracing element in existing buildings, however in these cases IBS makes no claim as to the bracing value that will be achieved.

If IBS RigidRAP® is to be installed as a bracing element in existing timber framed buildings, the following scope applies:

- Existing timber framed buildings where the designer and/or installer have assured themselves that the existing building is suitable for the intended building work.
- Existing concrete and timber sub-floor structures where the designer and/or installer have assured themselves that the existing building is suitable for the intended building work.

3.2 Limitations

- Allow a minimum of 4 mm between panels both vertically and horizontally to accommodate dimension movement.
- Maximum spacings of wall studs must not exceed 600 mm centres.
- Curved walls, minimum radius 2.5 m are allowable, the IBS RigidRAP® panels must be fixed horizontally onto framing studs with spacing and stud centres dependent on the radius.
- A proprietary 'Z' flashing must be installed at mid floor level where IBS RigidRAP® is installed on multi levels.
- Serviceability of the joints may be affected if - at the time the timber framing is installed - its moisture content is greater than 18%.
- For wall heights greater than 3050 mm, horizontal wall joints are permitted, provided the panel joint is over solid blocking of the same gauge as the studs.
- All joints, other than mid floor level, (vertical and horizontal) must be sealed with an IBS approved self- adhesive "flashing tape" as specified in section 3.8. IBS recommend 150 mm flashing tape or a proprietary Z flashing for horizontal joints.
- Steel fixings and fastenings must be in accordance with table 4.1, NZS 3604: 2011.
- Do not install IBS RigidRAP® if the building paper has delaminated from the OSB sheet.

When specifying IBS RigidRAP® as a bracing element, the designer must consider site specific conditions and the building with respect to, but not limited to, the following:

- Environmental (exposure) zone
- Wind zone
- Wall bracing table for wind and EQ demand
- Structural design loads
- Structural framing requirements
- Preparation of substrate
- External envelope
- Other materials likely to affect the performance of IBS RigidRAP®.



3.4 IBS RigidRAP® Bracing Capacity

The following table provides the bracing value for the different systems				
Table 1	Concrete Slab		Timber Floor	
	Wind	EQ	Wind	EQ
System 1: OSB - 300 mm x 2400 mm wall with GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts	49 BU/m	58 BU/m	49 BU/m	58 BU/m
System 2: OSB - 400 mm x 2400 mm wall with GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts.	70 BU/m	79 BU/m	70 BU/m	79 BU/m
System 3: OSB - 600 mm x 2400 mm wall with GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts	76 BU/m	81 BU/m	76 BU/m	81 BU/m
System 4: OSB - 1200 mm x 2400 mm wall with GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts	131 BU/m	107 BU/m	131 BU/m	107 BU/m
System 5: OSB - 2400 mm x 2400 mm wall with GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts	108 BU/m	89 BU/m	108 BU/m	89 BU/m
System 6: OSB - 1200 mm x 2400 mm wall without GIB HandiBrac® Fixing 30 mm x 2.5 mm Galv clouts	93 BU/m	78 BU/m	93 BU/m	78 BU/m
System 7: OSB - 400 mm x 2400 mm wall with GIB HandiBrac® GIB standard 10 mm board on the inside Fixing 30 mm x 2.5 mm Galv clouts	94 BU/m	104 BU/m	94 BU/m	104 BU/m
System 8: OSB - 600 mm x 2400 mm wall with GIB HandiBrac® GIB standard 10 mm board on the inside Fixing 30 mm x 2.5 mm Galv clouts	130 BU/m	130 BU/m	120 BU/m	120 BU/m
System 9: OSB - 1200 mm x 2400 mm wall with GIB HandiBrac® GIB standard 10 mm board on the inside Fixing 30 mm x 2.5 mm Galv clouts	150 BU/m	150 BU/m	130 BU/m	130 BU/m
System 10 - RigidRAP-XT® OSB - 600mm x 2400mm wall with 10mm EPS foam fitted on the inside with GIB HandiBrac® Fixing 50mm x 2.8mm Galv nails	60 BU/m	70 BU/m	60 BU/m	70 BU/m
System 11 - RigidRAP-XT® OSB - 1200mm x 2400mm wall with 10mm EPS foam fitted on the inside with GIB HandiBrac® Fixing 50mm x 2.8mm Galv nails	78 BU/m	71 BU/m	78 BU/m	71 BU/m



RigidRAP® - Installation Guide

NOTE:

Table 1 provides the bracing values for the different systems.

Note:

- For all bracing systems, no product substitution is allowed. Installation must be in accordance with these instructions. If these requirements are not met, IBS provides no assurance that the bracing capacity (claimed in this design and installation guide) will be achieved.
- The allowable racking resistances for the IBS RigidRAP® systems are applicable to frames lined with IBS RigidRAP® on one side only.
- Panels must always be installed vertically if used as bracing sheet. Sheets can be installed horizontally if not used as a bracing element.
- All IBS RigidRAP systems have been tested for no nogs or dwangs.
- Stud sizes and centres will vary depending on height load and loads ref: NZS3604:2011.

The systems may be used on walls of lengths different to those in Table 1 but is limited to:

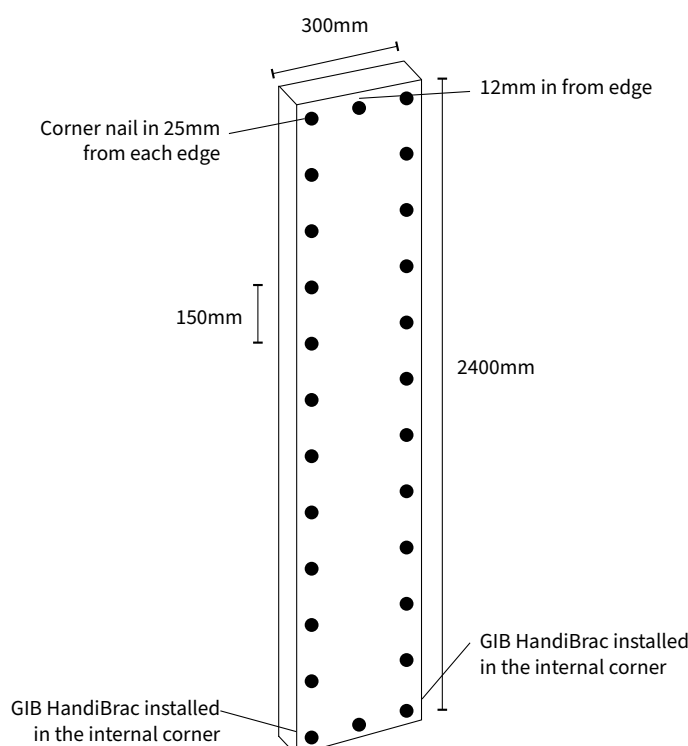
- Wall lengths no greater than twice the tested system length.
- For walls greater than the tested system length multiply the length of the wall on a pro-rata basis, up to double the length of the system.
- A wall height less than 1.5 meters shall be referred to a specific engineer design.
- A wall height less than 2.4 meters shall be rated as if they are 2.4 meters high.
- Panels higher than IBS RigidRAP® 2440 mm must be fixed top plate to bottom plate. When walls are higher than 2440 mm, IBS RigidRAP® 2745 or 3050mm sheets can be used.
- A part sheet can be used but must be nogged and nailed as per specification. Minimum sheet size is 300mm.



**SYSTEM 1 - FIG 1****IBS RigidRAP® 300 x 2400 MM WALL
USING GIB HANDIBRAC®**

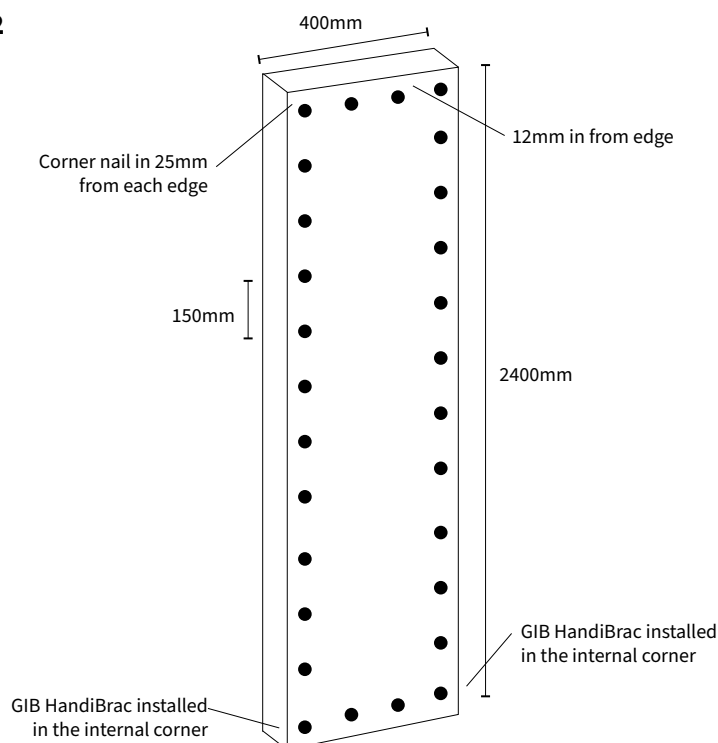
Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold down bolts.

FIG 1**SYSTEM 2 - FIG 2****IBS RigidRAP® 400 x 2400 MM WALL
USING GIB HANDIBRAC®**

Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold down bolts.

FIG 2

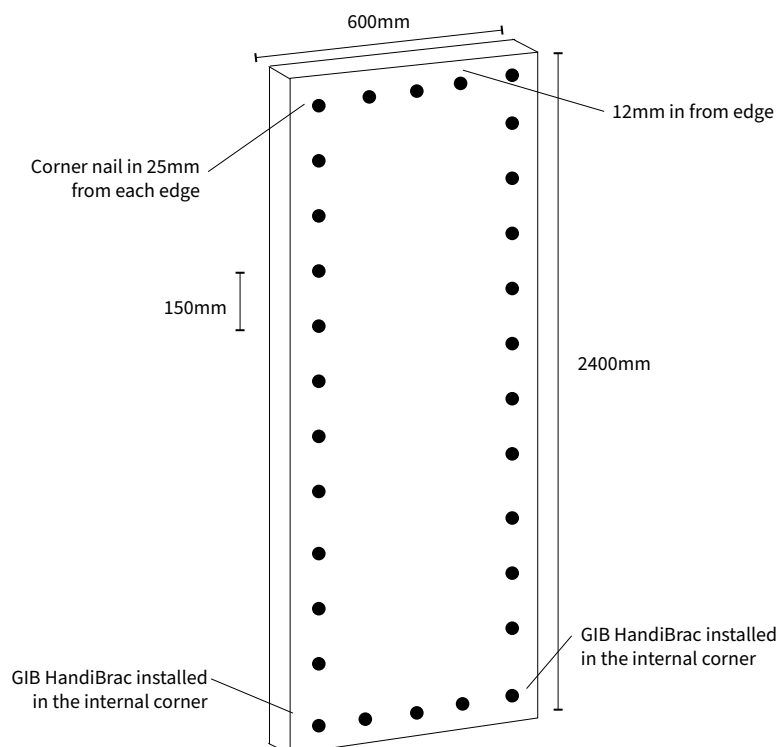


RigidRAP® - Installation Guide

SYSTEM 3 - FIG 3**IBS RigidRAP® 600 x 2400 MM WALL
USING GIB HANDIBRAC®**

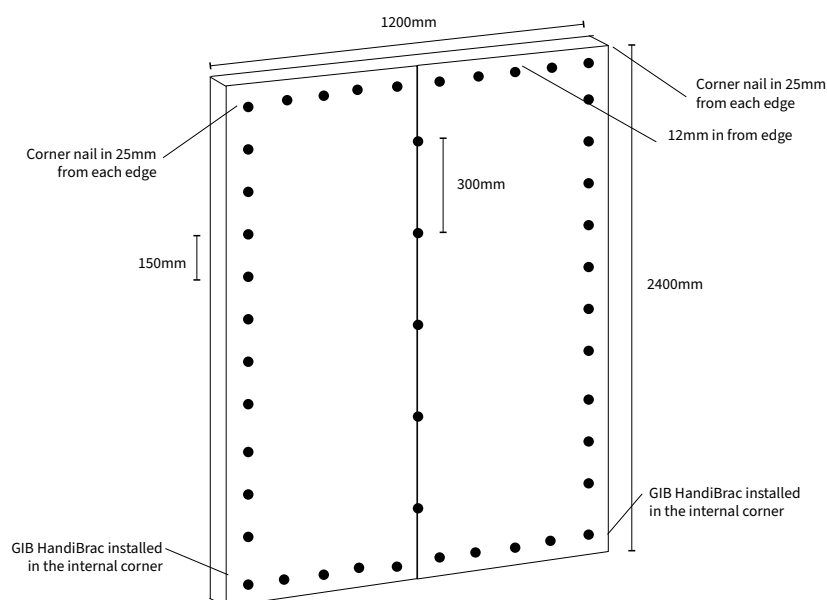
Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold down bolts.

FIG 3**SYSTEM 4 - FIG 4****IBS RigidRAP® 1200 x 2400 MM WALL
USING GIB HANDIBRAC®**

Wall construction:

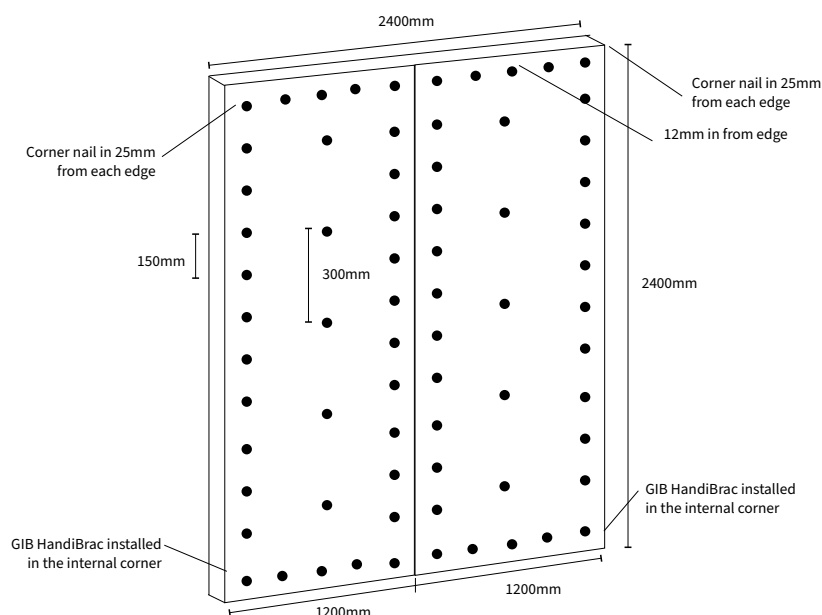
- 90 x 45 MSG8 studs (600 mm centres) plates.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold-down bolts.

FIG 4

**SYSTEM 5 - FIG 5****IBS RigidRAP® 2400 x 2400 MM WALL
USING GIB HANDIBRAC®**

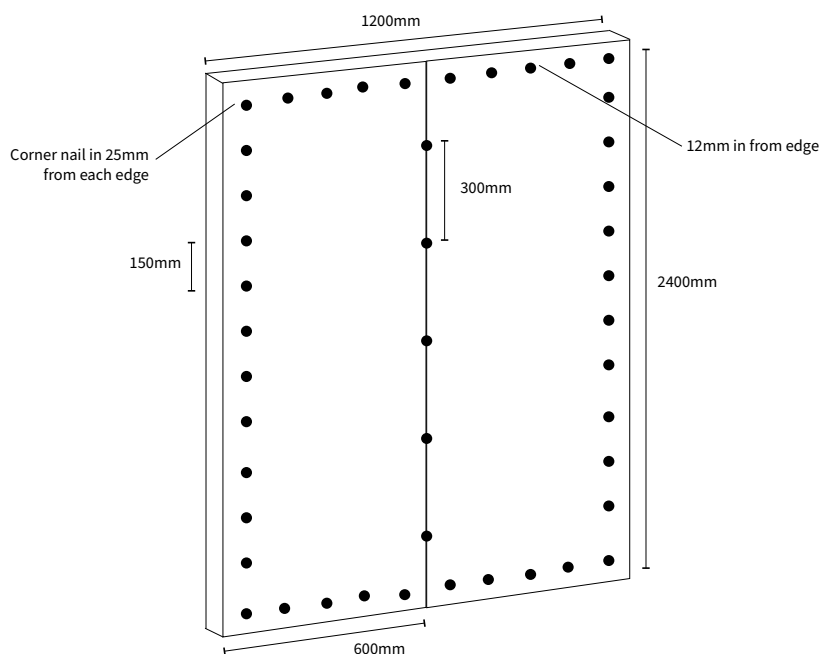
Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold down bolts.

FIG 5**SYSTEM 6 - FIG 6****IBS RigidRAP® 1200 x 2400 MM WALL**

Wall construction:

- 90 x 45 MSG8 studs (600 mm centres) plates.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- No hold down brackets

FIG 6

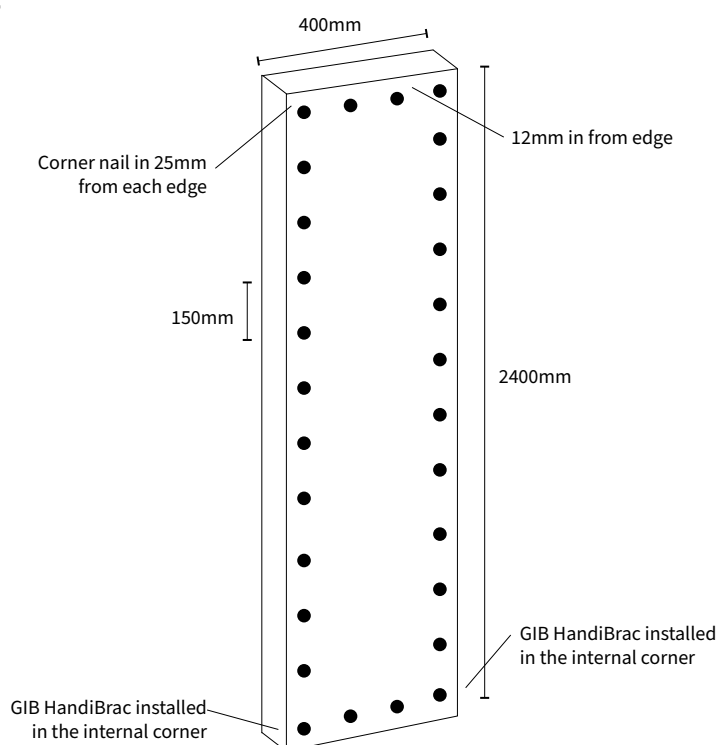


RigidRAP® - Installation Guide

SYSTEM 7 - FIG 7**IBS RigidRAP® 400 x 2400 MM WALL
USING GIB HANDIBRAC® AND GIB
BOARD**

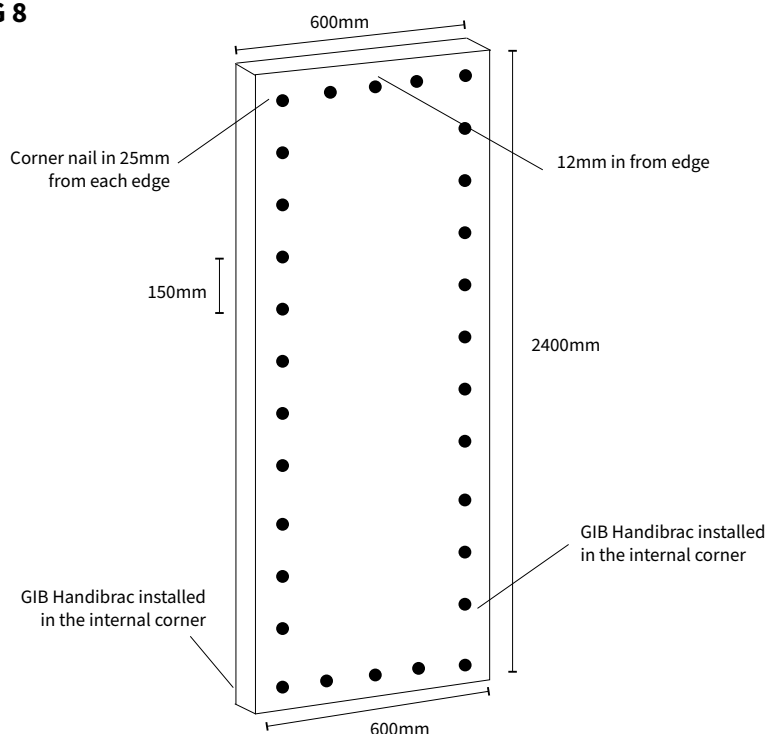
Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- GIB standard 10 mm board on the inside.
- Tested on a concrete floor with M12 hold down bolts.

FIG 7**SYSTEM 8 - FIG 8****IBS RigidRAP® 600 x 2400 MM WALL
USING GIB HANDIBRAC® AND GIB
BOARD**

Wall construction:

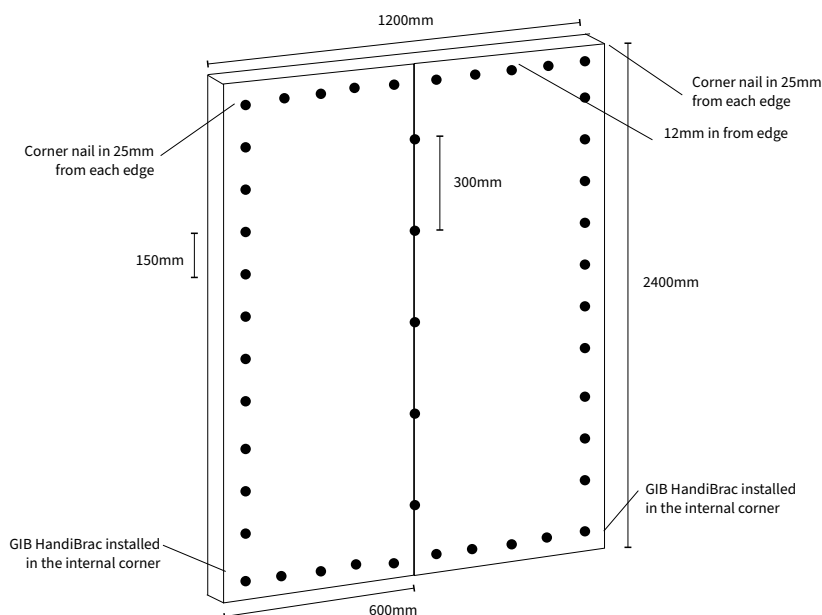
- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- GIB standard 10 mm board on the inside.
- Tested on a concrete floor with M12 hold down bolts.

FIG 8

**SYSTEM 9 - FIG 9****IBS RigidRAP® 1200 x 2400 MM WALL USING GIB HANDIBRAC® AND GIB BOARD**

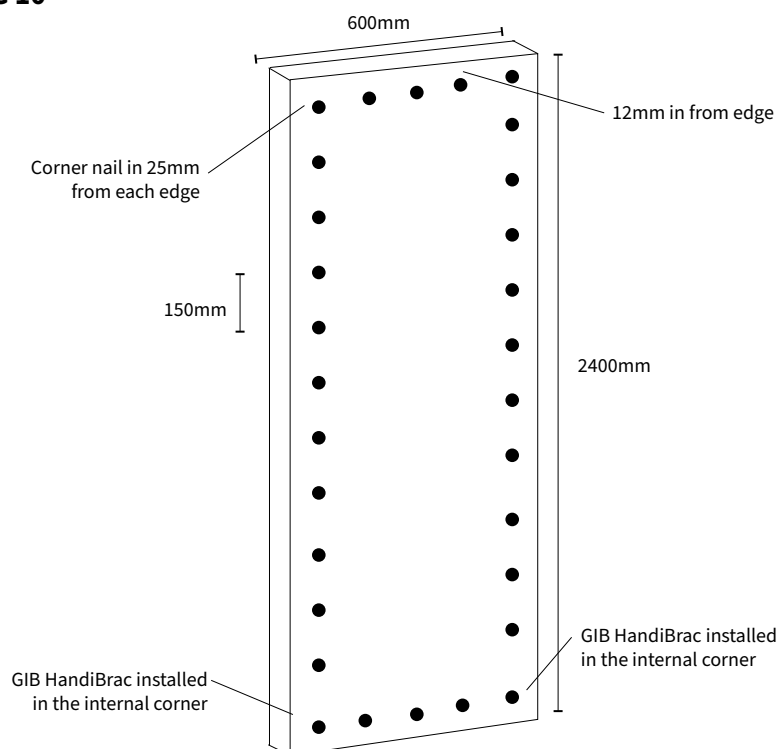
Wall construction:

- 90 x 45 MSG8 studs (600 mm centres) plates.
- 8 mm IBS RigidRAP-XT® panel one side.
- 30 x 2.5 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- GIB standard 10 mm board on the inside.
- Tested on a concrete floor with M12 hold down bolts.

FIG 9**SYSTEM 10 - FIG 10****IBS RigidRAP-XT® 600 x 2400 MM WALL USING GIB HANDIBRAC® AND 10MM EPS FOAM**

Wall construction:

- 90 x 45 MSG8 studs.
- 8 mm IBS RigidRAP-XT® panel one side.
- 50 x 2.8 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold down bolts.

FIG 10

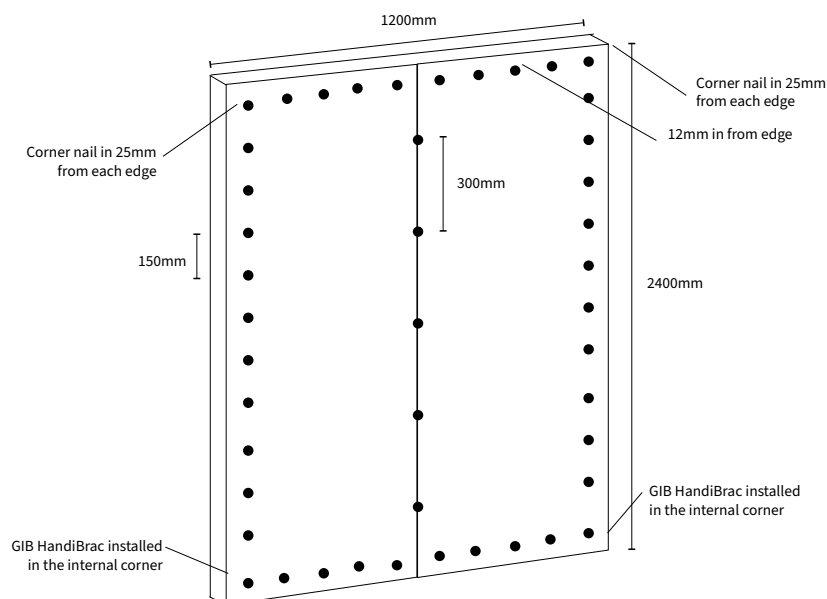


RigidRAP® - Installation Guide

SYSTEM 11 - FIG 11**FIG 11****IBS RigidRAP-XT® 1200 x 2400 MM WALL
USING GIB HANDIBRAC®**

Wall construction:

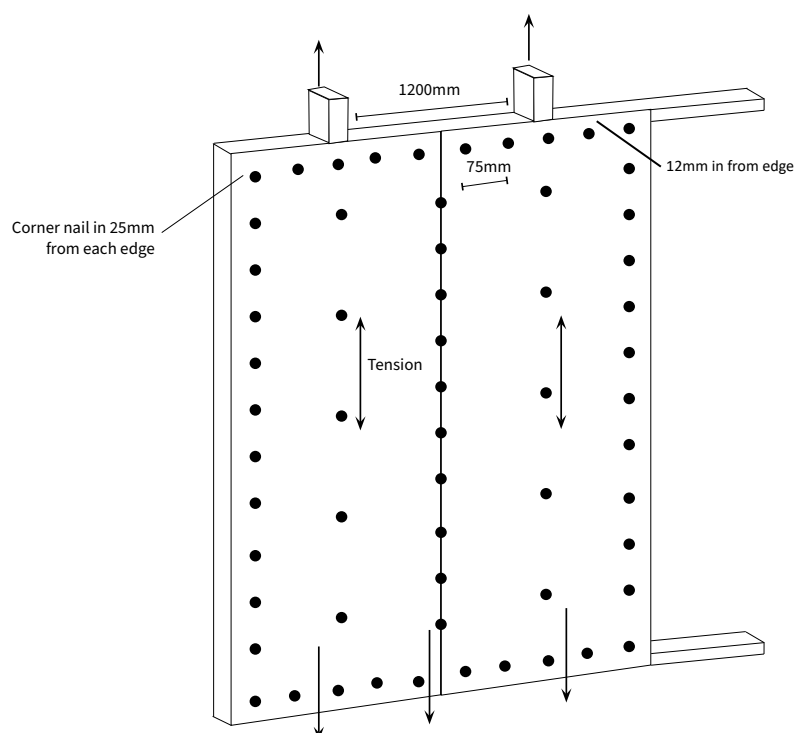
- 90 x 45 MSG8 studs (600 mm centres) plates.
- 8 mm IBS RigidRAP® panel one side.
- 50 x 2.8 mm galv clouts at 150 mm centres around the perimeter.
- GIB HandiBrac® hold down brackets fixed to each end-to-end studs and to bottom plate with concrete hold downs as per manufacturer's specifications.
- Tested on a concrete floor with M12 hold-down bolts.

**3.5 Top Plate to Rafter or Truss Connections**

RigidRAP sheathed wall frames transfer these uplift loads to the bottom plates; the IBS RigidRAP® acting in tension as a continuous cycle rod. Refer to NZS3604:2011 Table 8.18 for uplift connections between top plate and roof framing. Rafter/truss spacing is determined by the loaded dimensions.

Top Plate / Stud Mechanical Fixings

Uplift top plate/stud mechanical connections in accordance with NZS3604:2011 up to 7.5kN can be omitted where IBS RigidRAP® and fixings are installed (top and bottom plates) at a maximum spacing of 75 mm.



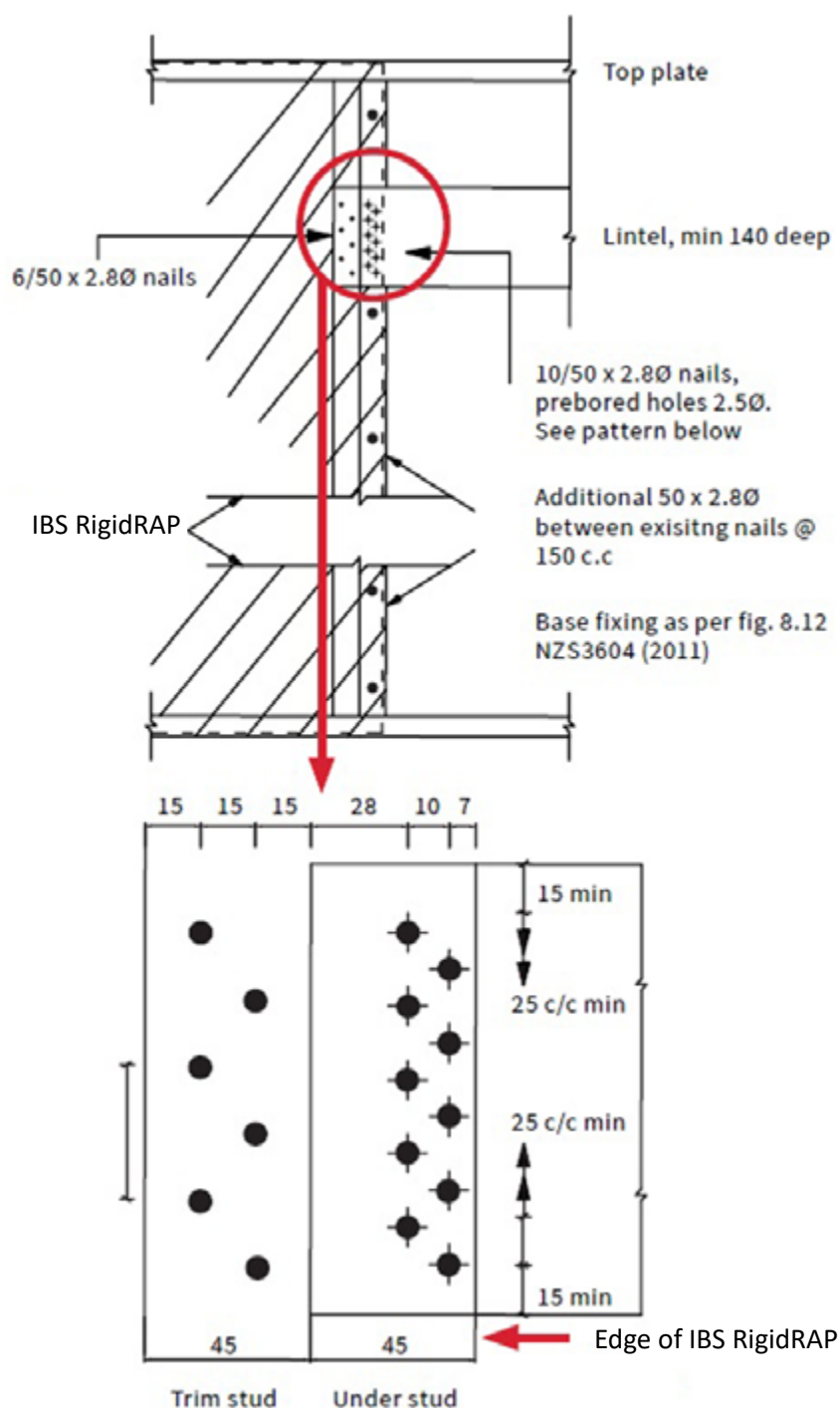
Bottom plate to floor or sub floor connection as per NZS 3604:2011.

Allowable uplift resistance (kN/rafter)	Fastener spacing (mm) top and bottom plates
7.5	75
8.5	40



3.6 Lintel Tie Down Details

Where the uplift does not exceed 7.5kN, the following strap fixing detail may be used as an alternate to 7.5kN strap fixing detailed in NZS3604: 2011, FIG 8.12.



3.7 Fixings

General

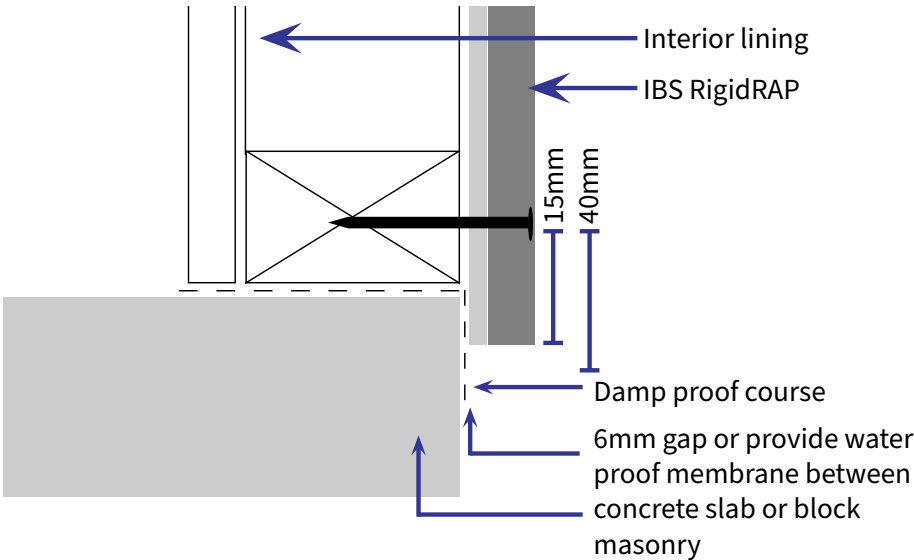
Fixing	Exposure Zone
Type 304 S/ Steel, Gauge 8 x 25 Surefix Screws	All exposure zones
45 x 2.5 S/Steel AnnularGrooved Nails	All exposure zones
30 x 2.5 Galv Clouts	Exposure zone B & C only

Bottom Plate Fixing

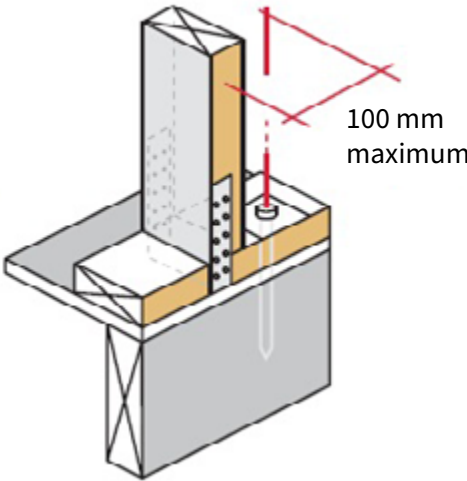
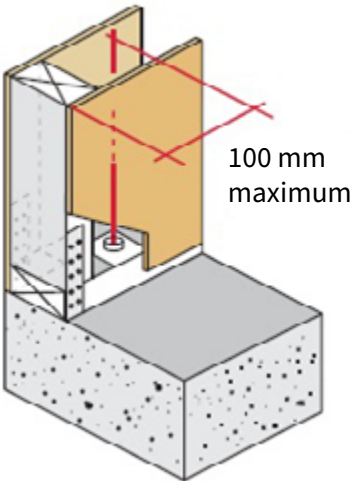
Bottom Plate Fixing	Exposure Zone
GIB HandiBrac® Use supplied hold-down bolts	Steel fixing as per table 4:1 NZS3604:2011

Nails can be power driven.
Do not puncture the paper.
Finish flush.

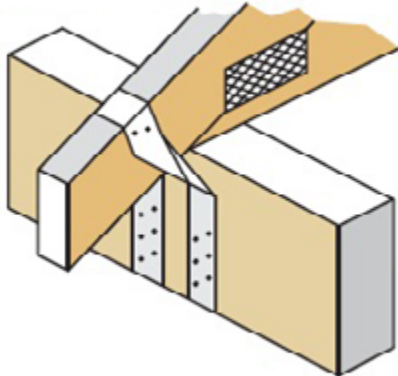
Bottom Plate Fixing Details – Base Detail



Bottom plate detail to concrete or timber floor (with 25 mm x 1 mm strap)



4 or 6 nails per LEG as specified

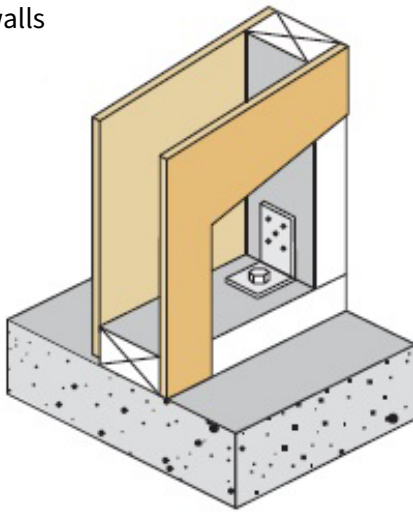


Cyclone strap fixed to side e.g. QH5S6



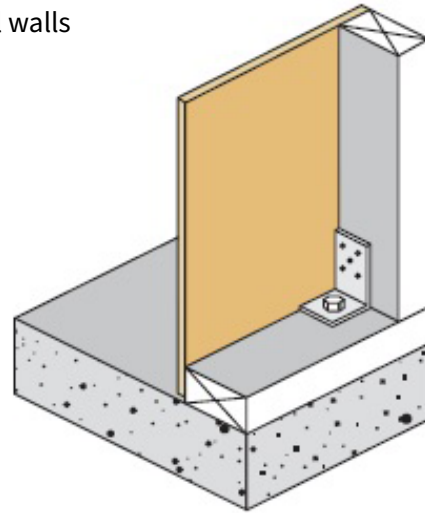
GIB HandiBrac® Installation – Concrete Floor

Internal walls



Position GIB HandiBrac® at the stud/plate junction.

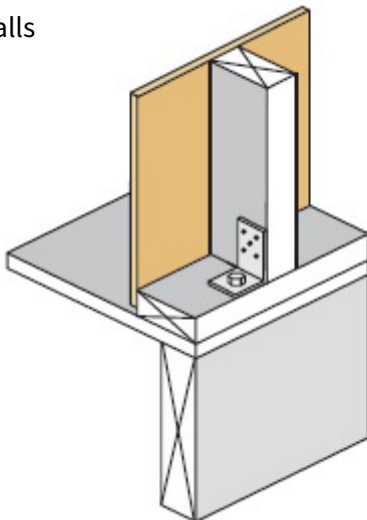
External walls



Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.

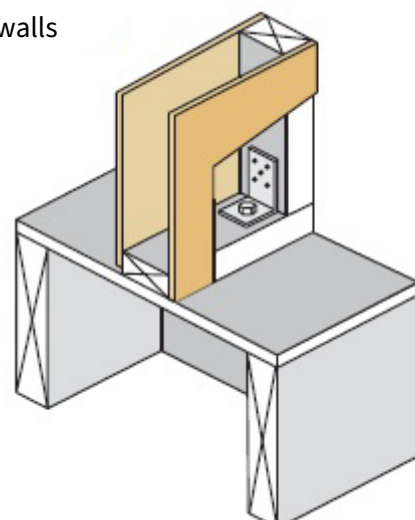
GIB HandiBrac® Installation – Timber Floor

External walls



Position GIB HandiBrac® in the centre of the perimeter joist or bearer.

Internal walls



Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.



RigidRAP® - Installation Guide

3.8 Mechanical Connections

(Uplift & Hold Down)

Connections	Exposure Zone
Cyclone ties (304-2B Stainless Steel) Nails SS 30 mm x 3.15 mm in diameter	All exposure zones
1 x 25 - Sheet Brace Strap (304-2B Stainless Steel) Nails SS 6/30 x 3.15 diameter nails per strap end for 6kN capacity, 2 straps for 12kN	All exposure zones
GIB HandiBrac® https://www.gib.co.nz/products/fasteners-and-brackets/gibhandibrac/	All exposure zones
Cyclone Ties (G300 Z275 Galvanised Steel) Nails 30 mm x 3.15 mm in diameter	Exposure zones B & C only
1 x 25-Sheet Brace strap (G300 Z275 Galvanised Steel) Nails 6/30 x 3.15 diameter nails per strap end for 6kN capacity, 2 straps for 12kN	Exposure zones B & C only
Mitek angle bracket CPC80 - 1.55, G300, Z275, 16 x 30 mm x 3.15 mm dia. 8/Type 17, 14g x 35 hex head	Exposure zones B & C only
Simpson Strong-Tie DTT2Z - 1.74 mm, G-185, 8 x 6 mm dia x 40 screws, M12 galv. threaded rod, ChemSet	Exposure zones B & C only

3.9 Joint Sealing and Window Tape

The following tapes may be used to seal panels:

Approved Joint and Window Tape (minimum face cover 50 mm)	
Thermakraft Premium Joining Tape 75mm x 23m	https://www.thermakraft.co.nz/products/tapes-accessories/premium-joining-tape
3M™ All Weather Flashing Tape 8067	https://www.3mnz.co.nz/3M/en_NZ/p/d/b40068318/
TESCON EXTORA IBS-OS (Pro Clima)	https://proclima.co.nz/tescon-extora/
SUPER-STICK (Marshall Innovations)	https://www.mwnz.com/product/superstick-door-window-flashing-tape
Hydro Tape (masons 75 mm)	https://mpb.co.nz/product/hydro-window-flashing-tape/
Masons 40 Below	https://mpb.co.nz/product/40-below/
Watertight	https://technowrapping.co.nz/watertight-products/
DriStud Cool Tape	https://www.drinspace.co.nz/product/dristud-cool-window-flashing
EUROBAND S 60	https://www.frameprotection.co.nz/
SIGA Wigluv	https://www.siga.swiss/

The tape is to be installed in accordance with the specific supplier instructions.

All joints and penetrations must be sealed including:

- Vertical and horizontal joints
- External and internal joints
- Penetrations
- Window and door joinery

Where sealing a joint, ensure the IBS RigidRAP® joints are centred under the tape joint. Use a 25 mm hard PVC roller to ensure full adhesion.



4. External Wall Wrap - Rigid Air Barrier

4.1 Scope of Use

IBS supply IBS RigidRAP® for use in exterior wall construction as an alternative to wall wrap or where a rigid air barrier is required. Applied to the outer face of the exterior framing, IBS RigidRAP® will minimise the pressure difference across the wall construction, thereby forming part of a weathertight external envelope. When installed in accordance with Section 4, IBS RigidRAP® performs the function of a rigid air barrier with bracing capacity.

4.2 Non-Structural Rigid Air Barrier

Scope of Use:

Where RigidRAP® is to be used as a rigid air barrier without a bracing function then the scope of use is increased to include lightweight steel framing provided that a thermal break is installed - in this case, RigidRAP®-XT shall be used.

IBS RigidRAP® panels shall be nailed off at a minimum of 300 mm centres around the perimeter and through the body of the sheet. Rigidity of the panels will be maximised if the panels are nailed off around the perimeter at 150 mm.

All other installation details to be in accordance with section 4 (IBS RigidRAP® as a bracing element).

The IBS RigidRAP® must be allowed to acclimatise for at least 48 hours prior to installation.

When specifying IBS RigidRAP® as a rigid air barrier, the designer must take into account site specific conditions and the building with respect to, but not limited to, the following:

- Environmental (exposure) zone
- Wind zone
- Wall bracing table for wind and EQ demand
- Structural design loads and framing requirements
- Preparation of substrate
- External envelope
- Other materials likely to affect the performance of IBS RigidRAP®.

5. Temporary Weather Cladding

5.1 Scope of Use

IBS RigidRAP® shall only be used as a rigid air barrier where the cladding system incorporates a ventilated cavity and wall cladding that complies with E2/AS1 or is covered by a relevant CodeMark certificate.

6. Further Information

6.1 What is OSB3?

OSB3 (oriented strand board 3) is a moisture resistant, structural wood panel. Engineered in Germany from environmentally sustainable sourced softwood, it consists of three layers of wood strands bonded together with heat-cured adhesives. Each layer is orientated at right angles to the adjacent layer creating a strong, dimensionally stable panel that resists delamination and warping. The absence of natural imperfections such as knots provides certainty of performance.

What makes OSB so strong is due to it being made of three layers, the top and bottom 25% layers are laid running the length of the sheet middle 50% is laid running the width of the sheet. This creates a strong structural panel that is resistant to delamination and warping.

6.2 What is wall underlay?

Wall underlay is a synthetic wall underlay. The product consists of a micro-porous water-resistant polypropylene film laminated between two layers of spunbonded polypropylene.

6.3 IBS RigidRAP® CodeMark explained

IBS is the certificate holder of CodeMark for IBS RigidRAP®. CodeMark is third party certified, allowed for under the Building Act 2004. This means that under law, a Building Consent Authority must accept the specification of IBS RigidRAP® (the panel and the installation details) as complying with the NZ Building Code, providing that all conditions of the certificate have been met.

Achieving CodeMark also focuses on the quality of IBS RigidRAP® panels. This means that designers and



RigidRAP® - Installation Guide

installers can use IBS RigidRAP® with confidence that, providing all instructions are followed, IBS RigidRAP® will result in building work complying with the NZ Building Code.

7. Additional Resources

For compliance information of IBS RigidRAP® refer to:

- IBS Product Specification
- IBS CAD drawings

For information to help with the maintenance and warranty of IBS RigidRAP® refer to:

- IBS Maintenance and Warranty if IBS RigidRAP®
- www.ibs.co.nz

8. Available Details

IBS supply further details to assist in the specification of IBS RigidRAP®. These details are available in .dwg, .pdf and .jpg formats. Go to www.ibs.co.nz to download.

9. Limitations

The information contained in this document is current as at May 2022 and is based on data available to IBS Sustainable Building Products at the current time.

All photographic images are intended to provide a general impression only and shall not be relied upon as an accurate example of IBS RigidRAP® products installed in accordance with this document.

IBS reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call 0800 367 759 or visit www.ibs.co.nz to obtain current information.

IBS has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, IBS assumes no responsibility or liability for any inaccuracies, omissions, or errors in this information nor for any actions taken in reliance on this information.

10. Frequently Asked Questions

Q. How long can IBS RigidRAP be left exposed for?

A. IBS RigidRAP can be left exposed to the weather for up to 90 days.

Q. Do I need to leave an expansion gap between sheets?

A. IBS RigidRAP is designed for a 4mm gap between all sheets vertical and horizontal.

Q. Do I need to tape all the joins?

A. Yes, all joins vertical and horizontal need to be taped.

Q. How do you join mid floor sheets?

A. All horizontal mid floor joins need to have a Z flashing.

Q. Do all horizontal joins need a Z flashing?

A. No you can use 150mm tape on all other horizontal joins.

Q. Can I use IBS RigidRAP on steel frames?

A. No, for steel frames you need to use IBS RigidRAP-XT as you need a thermal break.

Q. Do nails and screws need to have tape on them?

A. No, you do not need to tape over them unless they penetrate the board. All fixings shall finish flush with the board.

Q. Can IBS RigidRAP be used as bracing?

A. Yes, IBS RigidRAP has been tested as a bracing element. Details are listed in this installation guide.

Q. Do I need to install sheets vertically?

A. Yes, when used as a bracing element, all sheets need to be installed vertically. If using IBS RigidRAP as a rap only, sheets can be installed horizontally as well.

11. CodeMark



CERTIFICATE NO: CM70035 Rev 2
Date of issue: 22 June 2022

1

CERTIFICATE HOLDER DETAILS

IBS Building Products
Independent Building Supplies Ltd
1/7 Fraser Road,
Mt Wellington, Auckland 1072
New Zealand
Email: info@ibs.co.nz
Ph: 0800 367 759
www.ibs.co.nz



2

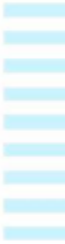
PRODUCT CERTIFICATION BODY

Bureau Veritas Australia Pty Ltd
3/435 Williamstown Road
Port Melbourne VIC 3207
Australia
Ph: 1800 855 190
www.bureauveritas.com.au
Bureau Veritas Australia Pty Ltd
The complaints process for this certificate
can be found here:
www.bureauveritas.com.au/your-feedback



PRODUCT CERTIFICATE

IBS RigidRAP®





BUREAU
VERITAS

KEY INFORMATION

3

SUMMARY OF DESCRIPTION OF BUILDING METHOD OR PRODUCT

IBS RigidRAP® is an 8mm OSB panel product faced with a laminated synthetic building wrap.
Continuation of description can be found in item 9. Supporting information about description of building product or method. Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and limitations of use.

4

SUMMARY OF INTENDED USE OF BUILDING METHOD OR PRODUCT

IBS RigidRAP® is a rigid air barrier and bracing element and provides temporary protection from the weather during construction. It is suitable for use on new and existing timber framed buildings founded on either a concrete floor slab or timber subfloor. When all joints are sealed with a flashing tape, no flexible wall underlay is required.
Continuation of intended use can be found in item 8. Supporting information about intended use of building product or method.

5

BUILDING CODE PROVISIONS

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

B1 Structure: B1.3.1; B1.3.2; B1.3.3(a, b, f, h); B1.3.4
B2 Durability: B2.3.1(a)
E2 External Moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.6 (contributes to), E2.3.7 (contributes to)
F2 Hazardous Building Materials: F2.3.1

How the building method or product complies or contributes can be found in item 12. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

Page 1 of 5

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.
CERTIFICATE V1.3

May22 | IBS Sustainable Building Products

BCO10364430 Received by Auckland Council 10/03/2023

21



12. IBS RigidRAP® installation checklist

The below installation areas are considered critical to the successful installation of IBS RigidRAP®. Using this sheet as a checklist during installation will aid in problem free product installation and long term product durability post construction.

Task	X when checked
Prior to Specification and Installation	
Read the IBS RigidRAP® Installation Guide & have a hard copy on site	☐
Health and Safety	
Take all steps to ensure your safety and the safety of others (adequate ventilation and protection)	☐
Ensure IBS RigidRAP® is well supported when cutting or drilling the panel	
Install	
IBS RigidRAP® panels with the polypropylene film laminated facing outwards	☐
Ensure clean-cut edges with sharp tools, using a backing block to minimize break out	
Joint Sealing and Window Tape	
Use an approved flashing tape in accordance with the specific supplier instructions (page 18)	☐
Ensure the IBS RigidRAP® joints are centred under the tape joint (all joints and penetrations must be sealed)	☐
Service Penetration	
Service penetrations must be sealed using a flexible flashing tape	☐
Pipe penetrations through IBS RigidRAP® must have a minimum of 5° slope to the outside	☐
Minimum of 25mm cover around the pipe and 100 mm minimum surface adhesion to IBS RigidRAP® panel surrounding the penetration	☐
Window Opening	
Flashing window openings must be carried out in accordance with WNZ Guide to E2/ASI (6)	☐
Bracing Capacity	
IBS RigidRAP® may be used as a bracing element within the required scopes detailed in the IBS RigidRAP® Installation Guide (table 1, page 7)	☐
Installation must be in accordance with the instructions in the IBS RigidRAP® Installation Guide (for all bracing systems, no product substitution is allowed)	☐
Handling and Storage	
Ensure correct storage and handling in transport for the protection of IBS RigidRAP®	☐
Finishing	
A 20 mm ventilated cavity and the cladding/joinery system must be installed so that it complies with the NZ Building Code.	☐



NOTES:



1/7 Fraser Road, Panmure, Auckland, New Zealand
0800 367 759 | info@ibs.co.nz
www.ibs.co.nz



PRODUCT DATA SHEET

Roof

PINK® BATTS® SKILLION ROOF INSULATION

Application

When standard insulation is too thick, use Pink® Batts® Skillion Roof insulation to maintain required clearances from roofing materials while providing the level of comfort and savings that comes with higher R-values.

Pink® Batts® Skillion Roof is designed to be used in skillion roof constructions while still achieving the minimum 25mm clearance between the roof underlay and insulation in:

- New buildings and retrofits of existing ceilings
- Modern 'lean to' style extensions on existing homes
- Low profile roof design and restricted roof cavities

Cathedral style roofs and raked ceilings are generally skillion roof constructions where the ceiling line and roof line are in parallel.

Features and Benefits

- Specifically designed for Skillion Roofs – provides New Zealand Building Code (NZBC) levels of thermal insulation while providing minimum ventilation clearances
- Easy to install – Lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – Gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from over 80% recycled glass – making sustainable use of waste
- Made in New Zealand - designed for New Zealand building conditions and reduces emissions associated with the importing of overseas manufactured product

pink® batts®

Always.

■ pinkbatts.co.nz

This product data sheet may have been superseded. Please refer to pinkbatts.co.nz or call 0800 746 522 for the most current information.

July21/1082 RevD
Page 1 of 5



Roof

PINK® BATTS® SKILLION ROOF INSULATION

PRODUCT DATA SHEET

Critical Design Considerations

Historically there have been moisture related problems with skillion roofs. The following design factors should be considered to ensure your roof's performance and durability.

Internal moisture and condensation

- To prevent internal moisture entering the roof space, use vapour resistant lining in wet areas such as kitchens and bathrooms (e.g. gloss/oil based paint systems)
- Reduce airflow into the roof cavity through ceiling linings that are resistant to airflow (e.g. for a tongue and groove ceiling) by using a breather type air barrier
- Reduce penetrations through ceilings e.g. use sealed recessed downlights
- Special situations: Ski lodges, indoor pools/spas, cold stores may require an additional fully sealed vapour barrier (e.g. Sisalation® Heavy Duty 450)

Ventilation

- A minimum 25mm clearance between the top of the insulation and the building underlay is required to provide a minimum amount of ventilation and reduce moisture build up in the roof cavity. However in areas of high humidity and/or large temperature differences, additional ventilation may be required to compensate for higher levels of condensation and water vapour
- Ensure the insulation product you specify or install is guaranteed not to over recover or loft above the rafter depth; often nominal thickness measurements are not the maximum loft that segments will achieve

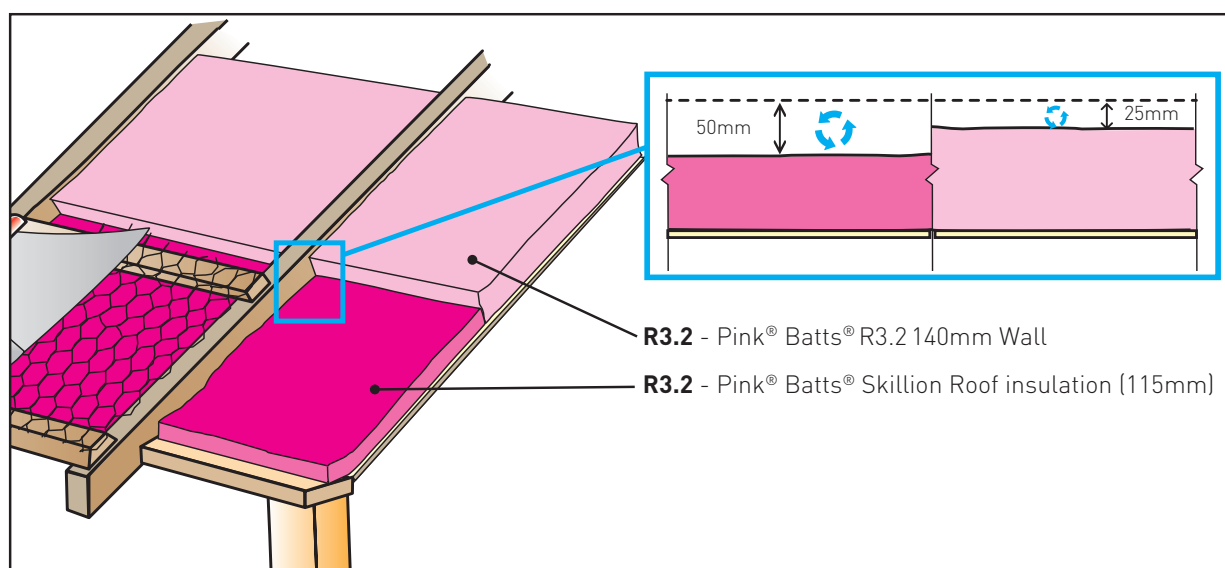
Trapped moisture

- To avoid trapping excessive levels of construction moisture into the roof cavity ensure timber, concrete and other building materials are dry before enclosing building

For more detailed information please refer to BRANZ Bulletin 525

How to reduce moisture related problems in skillion roofs

By providing additional ventilation, Pink® Batts® Skillion roof insulation achieves 100% more ventilation clearance, while still maintaining the same R-value as R3.2 140mm Wall (or R3.6 180mm) insulation products.



pink batts®
Always.



Roof

PINK® BATTS® SKILLION ROOF INSULATION

PRODUCT DATA SHEET

Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using over 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months¹
- Locally manufactured in New Zealand minimising shipping distances
- Recyclable packaging

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Environmental Choice. Further information is available at nzgbc.org.nz.

Environmental Choice

All Pink® Batts® ceiling insulation products have Environmental Choice New Zealand Accreditation (refer to Product Specifications on page 5 for accredited products)



Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

While only BRANZ appraised products are eligible for Environmental Choice, all Pink® Batts® insulation products are manufactured in the same environmentally considerate way.

¹ [Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005]



Roof

PINK® BATTS® SKILLION ROOF INSULATION

PRODUCT DATA SHEET

Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies the glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation²

² Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	= 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glass wool exempt	

* Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in ceilings and walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.





Roof

PINK® BATTS® SKILLION ROOF INSULATION

PRODUCT DATA SHEET

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® ceiling insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® ceiling insulation **MUST** be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing bulk thermal Insulation in Residential Buildings

Pink® Batts® ceiling insulation should **NOT** be crushed or folded

Product Specifications

ROOF - Thermal Insulation	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)*	NOMINAL TOTAL AREA PER BALE (m²)	APPROX. TOTAL AREA PER BALE (m²)**	ENVIRONMENTAL CHOICE
R3.2 Pink® Batts® Skillion Roof R3.2	7110232	1220 x 432	115 max	3.7	3.9	✓
R3.6 Pink® Batts® Skillion Roof R3.6	7110236	1220 x 432	165 max	6.3	6.6	✓
R4.5 Pink® Batts® Skillion Roof R4.5	7110245	1220 x 432	165 max	3.2	3.3	✓

* Stated thicknesses are maximum values.

**Coverage relates to standard structure and actual coverage may vary.

Accreditations/Appraisals/Certifications



Tasman Insulation New Zealand Ltd
Certified QMS



DISTRIBUTED BY

Tasman Insulation New Zealand Ltd
9-15 Holloway Place, Penrose, Auckland,
New Zealand

This document supersedes all previous versions and may have been superseded; is a guide only and the purchaser should ascertain the suitability of this product for the end-use situation intended and when used in conjunction with other products; and is provided without prejudice to Tasman Insulation New Zealand Ltd (Tasman) standard terms of sale. Tasman retains the right to change specifications without prior notice. Refer to www.pinkbatts.co.nz or consult Tasman for further information. Do not use this product for any application not detailed in this document. All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. The liability of Tasman and its employees and agents for any errors or omissions in this document or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. The colour PINK and Pink® are registered trademarks of Owens Corning used under license by Tasman Insulation. Batts® is the registered trade mark of Tasman Insulation.



Always.

■ pinkbatts.co.nz

This product data sheet may have been superseded. Please refer to pinkbatts.co.nz or call 0800 746 522 for the most current information.



Owner's Guide and Installation Instructions



Electric Domestic Water Heater Model 31202519V



*This water heater must be installed and serviced by a qualified person.
Please leave this guide with the householder.*



RHEEM NEW ZEALAND LIMITED

www.rheem.co.nz

For Service Telephone 0800 657 335 NEW ZEALAND

An electronic copy of these Owner's Guide and Installation Instructions
can be downloaded from rheem.co.nz.

PATENTS

This water heater may be protected by one or more patents or registered designs
in the name of Rheem Australia Pty Ltd or Rheem New Zealand Limited.

TRADEMARKS

® Registered trademark of Rheem Australia Pty Ltd or Rheem New Zealand Limited.
TM Trademark of Rheem Australia Pty Ltd or Rheem New Zealand Limited.

Note: Every care has been taken to ensure the accuracy in preparation of this
publication. No liability can be accepted for any consequences,
which may arise as a result of its application.



CONTENTS

HOUSEHOLDER

This booklet contains important information about your new water heater, including terms of the Rheem warranty.

We recommend you read pages 8 to 23, and the terms of the Rheem warranty on pages 4 to 7.

The other pages are intended for the installer but may be of interest.

Warranty4

Safety, Warnings, Installation Notes8

About Your Water Heater12

Maintenance Requirements15

Water Supplies17

Save A Service Call21

Installation24

Connections – Plumbing32

Connections – Electrical36

Commissioning38

Draining The Water Heater39



RHEEM ELECTRIC DOMESTIC MAINS PRESSURE WATER HEATER WARRANTY – NEW ZEALAND ONLY

ELECTRIC WATER HEATERS 312025 MODEL

In addition to your legal right, in New Zealand Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective unit or part of it, which has failed due to faulty manufacture on the following terms and conditions:

1. THE RHEEM WARRANTY – GENERAL

- 1.1 This warranty is given in respect of sales in New Zealand by Rheem New Zealand Limited of 475 Rosebank Road Avondale Auckland 1026.
- 1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the unit subject to the terms of the Rheem warranty in New Zealand – contact your Rheem Service Centre on 0800 657 335.
- 1.3 For details about this warranty, you can contact us at rheem@rheem.co.nz (not for service bookings) or phone your Rheem Service Centre on 0800 657 335.
- 1.4 The terms of this warranty and what is covered by it are set out in sections 2 and 3 and apply to water heaters manufactured from 1st November 2019.
- 1.5 If a subsequent version of this warranty is published, the terms of that warranty and what is covered by it will apply to water heaters manufactured after the date specified in the subsequent version.

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

- 2.1 Rheem may reject a claim under this warranty in its sole discretion if:
 - a) You do not arrange for a major service to be conducted on your water heater in the fifth year after installation, in accordance with Rheem's recommendation in the Owner's Guide and Installation Instructions; and
 - b) The fault giving rise to the warranty claim would have been detected and rectified during that major service.
- 2.2 The decision of whether to repair or replace a faulty component is at Rheem New Zealand Limited's sole discretion.
- 2.3 Where a failed component or cylinder is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem warranty.
- 2.4 Where the unit is installed outside the boundaries of a metropolitan area, defined by Rheem as further than 25 km from a Rheem Service Centre, the cost of transport, insurance and travelling between the Rheem Service Centre and the installed site shall be the owner's responsibility.



RHEEM ELECTRIC DOMESTIC MAINS PRESSURE WATER HEATER WARRANTY – NEW ZEALAND ONLY

ELECTRIC WATER HEATERS 312025 MODEL

- 2.5 Where the unit is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors, walls, roofs or trap doors and the cost of any special equipment to bring the unit to floor or ground level or to a serviceable position is not covered by this warranty.
- 2.6 This warranty only applies to the original and genuine Rheem unit in its original installed location and any genuine Rheem replacement parts. It does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the unit, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.
- 2.7 The Rheem warranty does not cover faults that are a result of:
- a) Accidental damage to the unit or any component, for example Acts of God such as floods, storms, fires, lightning strikes and the like and Third party acts or omissions.
 - b) Misuse or abnormal use of the unit.
 - c) Installation or use not in accordance with the Owner's Guide and Installation Instructions, New Zealand Building Code requirements or with relevant statutory and local requirements including failure to install a properly drained safe tray where required by the owners guide and installations.
 - d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions, or poor water quality outside the limits specified in the owners guide and installation instructions.
 - e) Repairs, attempts to repair or modifications to the unit by a person other than Rheem Service or a Rheem Accredited Service Technician.
 - f) Faulty plumbing or faulty power supply.
 - g) Failure to maintain the unit in accordance with the Owner's Guide and Installation Instructions.
 - h) Transport damage.
 - i) Fair wear and tear from adverse conditions (for example, corrosion).
 - j) Cosmetic defects.
- 2.8 If you require a call out and we find that the fault is not covered by the Rheem warranty, you are responsible for Rheem Service Centre call out costs. If you wish to have the relevant component repaired or replaced by Rheem that service will be at your cost.
- 2.9 Rheem may reject a claim under this warranty in its sole discretion if a third party solar diverter is connected to the water heater.
-



RHEEM ELECTRIC DOMESTIC MAINS PRESSURE WATER HEATER WARRANTY – NEW ZEALAND ONLY

ELECTRIC WATER HEATERS 312025 MODEL

- 2.10 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims however arising including under contract or tort for damage to furniture, carpet, walls, foundations or any other consequential loss or incidental expenses either directly or indirectly due to leakage from Rheem unit, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure.
- 2.11 This warranty excludes to the extent permissible all implied warranties set out in the Sale of Goods Act 1908 (New Zealand) and all guarantees set out in the Consumers Guarantees Act 1993 (New Zealand) to the extent that the goods are acquired for the purpose of resupply in trade consumption in the course of a process of production or manufacture or repairing or treating in trade other goods or fixtures on land.

3. WHAT IS COVERED BY THE RHEEM WARRANTY FOR THE WATER HEATERS DETAILED IN THIS DOCUMENT

- 3.1 Rheem will repair or replace a faulty component of your unit if it fails to operate in accordance with its specifications as follows:

What components are covered	The period from the date of installation in which the fault must appear in order to be covered	What coverage you receive
312025 model		
All components	Year 1	Repair and/or replacement of the faulty component, free of charge, including labour.
The cylinder (if the water heater is installed in a single-family domestic dwelling)	Years 2 to 5	Repair and / or replacement of the cylinder, free of charge, including labour.
	Years 6 to 10	Replacement cylinder, free of charge. Installation and repair labour costs are the responsibility of the owner.
The cylinder (if the water heater is <u>not</u> installed in a single-family domestic dwelling)	Years 2 & 3	Replacement cylinder, free of charge. Installation and repair labour costs are the responsibility of the owner.



RHEEM ELECTRIC DOMESTIC MAINS PRESSURE WATER HEATER WARRANTY – NEW ZEALAND ONLY

ELECTRIC WATER HEATERS 312025 MODEL

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

- 4.1 To be entitled to make a claim under this warranty you need to:
- a) Be the owner of the unit or have consent of the owner to act on their behalf.
 - b) Contact Rheem New Zealand Limited Service Department without undue delay after detection of the defect and, in any event, within the applicable warranty period.
 - c) Return the faulty component or unit as directed by the Rheem New Zealand Limited Service Department.
- 4.2 You are not entitled to make a claim under this warranty if your unit:
- a) Does not have its original serial numbers or rating labels.
 - b) Is not installed in New Zealand.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

- 5.1 If you wish to make a claim under this warranty, you need to:
- a) Contact Rheem New Zealand on 0800 657 335 and provide the owner's details, address of the unit, a contact number and date of installation of the unit or if that's unavailable, the date of manufacture and serial number (from the rating label on the unit).
 - b) A Rheem Service Centre will arrange for the unit to be tested and assessed on-site.
 - c) If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the unit in accordance with this warranty.
- 5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

6. THE CONSUMER GUARANTEES ACT 1993 (NEW ZEALAND)

- 6.1 Our goods come with guarantees that cannot be excluded under the Consumer Guarantees Act 1993 (New Zealand). If the goods fail to comply with the applicable guarantees set out under the Consumer Guarantees Act 1993 (New Zealand) being the guarantee as to acceptable quality, the guarantee as to correspondence with description or the guarantee as to repair and parts, or if the goods fail to comply with any express guarantee given by Rheem, then you are entitled to a replacement or refund and for compensation for any other reasonably foreseeable loss or damage.
- 6.2 The Rheem warranty (set out above) is in addition to any rights and remedies that you may have under the Consumer Guarantees Act 1993 (New Zealand).



SAFETY, WARNINGS, INSTALLATION NOTES

It is important you read the following safety and warnings information.

SAFETY AND WARNINGS

- This water heater is only intended to be operated by persons who have the experience or the knowledge and the capabilities to do so.
- This water heater is not intended to be operated by persons with reduced physical, sensory or mental capabilities i.e. the infirm, or by children. Children should be supervised to ensure they do not interfere with the water heater.
- If the electrical conduit to the water heater is damaged, it must be replaced by a qualified person in order to avoid a hazard. Phone your Rheem Service Centre to arrange for an inspection.
- This water heater uses 230 V a.c. power for the electrically operated components. The removal of the front cover will expose 230 V a.c. wiring. It must only be removed by a qualified person.
- This water heater is supplied with a thermostat, an over-temperature cut-out and a combination temperature pressure relief valve. These devices must not be tampered with or removed. The water heater must not be operated unless each of these devices is fitted and is in working order.

The Rheem warranty may not cover faults if relief valves or other safety devices are tampered with or if the installation is not in accordance with these instructions.

- **DANGER:** The operation of the over-temperature cut-out on a thermostat indicates a possibly dangerous situation. If the over-temperature cut-out operates, it must not be reset and the water heater must be serviced by a qualified person.
- The water heater will operate until a water temperature of 60°C to 70°C is reached, depending upon the thermostat setting.

Refer to “How Hot Should The Water Be?” on page 12 and “Temperature Adjustment” on page 13.

- The lever on the temperature pressure relief valve and expansion control valve (if fitted) requires to be operated every six (6) months to clear any deposits and to ensure the valve and its drain line are not blocked.

Refer to “Relief Valves” on page 9 and “Minor Maintenance Every Six Months” on page 16.

- For continued safety of this water heater it must be installed, operated and maintained in accordance with the Owner’s Guide and Installation Instructions.



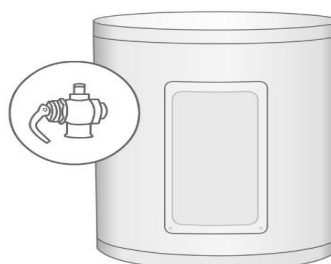
SAFETY, WARNINGS, INSTALLATION NOTES

- Servicing of a water heater must only be carried out by qualified personnel. Phone your Rheem Service Centre.
- Only a person qualified to install or service a water heater can drain the water heater, if this is required.
- Do not modify this water heater.

RELIEF VALVES

Temperature Pressure Relief Valve

This water heater incorporates a temperature pressure relief valve located near the top of the water heater. This valve is essential for the water heater's safe operation.



It is possible for the valve to discharge a quantity of water through the drain line during each heating period. This quantity should be equal to approximately 1/50 of the hot water used, as water expands by this volume when heated.

Expansion Control Valve

It is mandatory an expansion control valve is fitted to the cold water line to the water heater to comply with Clause G12 of the New Zealand Building Code, unless the water heater is installed as a push through installation.

The expansion control valve will discharge the quantity of water from its drain line during the heating period instead of the temperature pressure relief valve as it has a lower pressure rating.

Valve Operation

Continuous leakage of water from either valve and its drain line may indicate a problem with the water heater. Refer to **“Temperature Pressure Relief Valve or Expansion Control Valve Running”** on page 22.

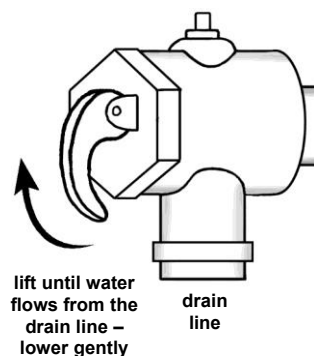
⚠ Warning: Never block the outlet of either valve or their drain lines for any reason. A relief valve drain must be left open to atmosphere, and be installed in a continuously downward direction.

In locations where water pipes are prone to freezing, the relief valve drain line must be insulated and not exceed 300 mm in length before discharging into a tundish through an air gap.



SAFETY, WARNINGS, INSTALLATION NOTES

Operate the easing lever on the temperature pressure relief valve and expansion control valve once every six (6) months to clear any deposits and ensure the valve and its drain line are not blocked. **It is very important the lever is raised and lowered gently.** Refer to **“Minor Maintenance Every Six Months”** on page 16.



⚠ Warning: Water discharged from the temperature pressure relief valve drain line will be hot. Exercise care to avoid any splashing of water by standing clear of the drain line's point of discharge when operating either valve's easing lever.

⚠ DANGER: Failure to operate the easing lever on the relief valve once every six (6) months may result in the water heater cylinder failing, or under certain circumstances, exploding.

If water does not flow freely from the drain line when the lever is lifted, then the water heater must be checked. Phone your Rheem Service Centre to arrange for an inspection.

The temperature pressure relief valve should be replaced at intervals not exceeding five (5) years and the expansion control valve should be checked for performance or replaced at intervals not exceeding five (5) years. The checking of the valves performance or replacement should occur more frequently in areas where there is a high incidence of water deposits. Refer to **“Water Supplies”** on page 17.

INSTALLATION NOTES

This water heater must be installed:

- by a qualified person,
- in accordance with the installation instructions,
- to conform to Clauses G12 and H1 of the New Zealand Building Code,
- in compliance with the Plumbing Standard AS/NZS 3500.4,
 - This water heater is suitable for either indoor or outdoor installation.
 - This water heater is intended to be permanently connected to the water mains and not connected by a hose-set. A braided flexible hose or semi-flexible connector may be used for connection to the water heater, where permitted by AS/NZS 3500.4.



SAFETY, WARNINGS, INSTALLATION NOTES

- in compliance with the Australian / New Zealand Wiring Rules AS/NZS 3000,
 - Isolation switches must be installed in the electrical circuit to the water heater in accordance with the Wiring Rules, so the water heater can be switched off.
 - The power supply wires are to be directly connected to the terminal block and earth tab connection, with no excess wire loops inside the front cover. The temperature rating of the power supply wires insulation must suit this application, or the wiring protected by insulating sleeving with an appropriate temperature rating if it can make contact with the internal storage cylinder. The temperature of the internal storage cylinder can reach 70°C under normal operation.
- in compliance with all local codes and regulatory authority requirements,

Installation and commissioning requirements and details for the installing plumber and licensed electrical worker are contained on [pages 24 to 38](#).

Mains pressure water supply

The water heater is designed to operate at mains pressure by connecting directly to the mains water supply.

The water heater is supplied with a temperature pressure relief valve with a pressure rating of 1000 kPa. If an expansion control valve has been installed on the cold water line to the water heater, this should have a pressure rating of 850 kPa.

The maximum mains water supply pressure for the water heater is 800 kPa if an expansion control valve is not installed, or 680 kPa if an expansion control valve is installed. If the mains supply pressure in your area exceeds these values, a pressure limiting valve must be installed.

The supply pressure should be greater than 350 kPa for true mains pressure operation to be achieved.



ABOUT YOUR WATER HEATER

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

MODEL TYPE

The Rheem® 312025 model water heater you have chosen has a single heating unit and is suitable for connection to a continuous power supply. The water heater is suitable for either indoor or outdoor installation.

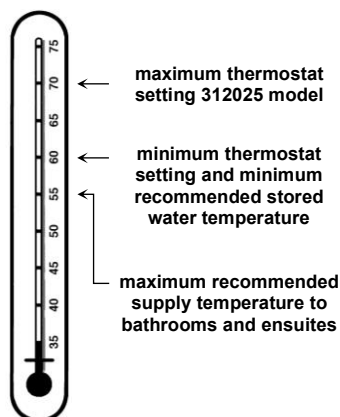


Water is stored in a vitreous enamel lined steel cylinder and heated by the electric immersion heating unit. The thermostat controls the temperature. Automatic safety controls are fitted to the water heater to provide safe and efficient operation.

HOW HOT SHOULD THE WATER BE?

The water heater features a tradesperson adjustable thermostat, which allows you to choose the most suitable temperature for your hot water needs. Refer to **"Temperature Adjustment"** on page 13.

To meet the requirements of the New Zealand Building Code the temperature of the stored water must not be below 60°C.



HOTTER WATER INCREASES THE RISK OF SCALD INJURY

This water heater can deliver hot water at temperatures up to 70°C depending upon the thermostat setting, sufficiently hot to cause severe scalding. Water at these temperatures may have been plumbed to fixtures where water hotter than 55°C is allowed, such as the kitchen and laundry.

Check the water temperature before use, such as when entering a shower or filling a bath or basin, to ensure it is suitable for the application and will not cause scald injury.



ABOUT YOUR WATER HEATER

We recommend and it may also be required by regulations that an approved temperature limiting device be fitted into the hot water pipe work to the bathroom and ensuite when a Rheem 312 series water heater is installed. This will keep the water temperature below 55°C at the bathroom and ensuite. The risk of scald injury will be reduced and still allow hotter water to the kitchen and laundry.

THERMOSTAT

The thermostat automatically controls the electricity supply to the heating unit so a constant temperature is maintained. The thermostat and its protective over temperature cut out is mounted inside the front cover of the water heater. There is no need to switch the water heater off when it is not in use, except when you are on an extended holiday. The thermostat is fully automatic and power is only used when heating is required.

TEMPERATURE ADJUSTMENT

A Rheem 312025 model water heater features a tradesperson adjustable thermostat. This requires a licensed electrical worker to make any temperature adjustments. The thermostat has a maximum temperature setting of 70°C. The minimum temperature setting is 60°C.

We advise you to have a licensed electrical worker adjust the thermostat to the lowest temperature setting that meets your needs, especially if there are young children or elderly people in your home. Refer to [“Hotter Water Increases The Risk of Scald Injury”](#) on page 12.

PRECAUTIONS

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed in a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements. The safe tray must also meet the requirements of Clause G12 of the New Zealand Building Code. AS/NZS 3500.4 and the NZBC also have particular requirements when a safe tray must be installed.

The water heater must be maintained in accordance with the Owner's Guide and Installation Instructions. Refer to [“Maintenance Requirements”](#) on page 15 and to [“Anode Inspection and Replacement”](#) on page 18.

If this water heater is to be used where an uninterrupted hot water supply is necessary for your application or business you should ensure that you have back-up redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater were to become inoperable for any reason. We recommend you seek advice from a plumber or specifier about your needs and building back-up redundancy into your hot water supply system.



ABOUT YOUR WATER HEATER

TO TURN OFF THE WATER HEATER

If you plan to be away from home for only a few nights, we suggest you leave the water heater switched on.

If it is necessary to turn off the water heater:

- Switch off the electrical supply at the water heater isolating switch on the switchboard or at the isolating switch at the water heater (if installed).
- Close the cold water isolation valve at the inlet to the water heater.

TO TURN ON THE WATER HEATER

- Open the cold water isolation valve fully on the cold water line to the water heater.
- Switch on the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).

GOING ON HOLIDAY?

If you plan to be away from home for one or two nights, we suggest you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at either the switchboard or isolating switch (if one is installed).

Note: When the electrical supply is switched back on, the water heater will take some time to reheat the water.

DOES THE WATER CHEMISTRY AFFECT THE WATER HEATER?

The water heater is suitable for most public water supplies, however some water chemistries may have detrimental effects on the water heater, its components and fittings. Refer to ["Water Supplies"](#) on page 17.

If you are in a known harsh water area or you are not sure of your water chemistry, have your water checked against the conditions [described on pages 17 to 20](#).

HOW LONG WILL THE WATER HEATER LAST?

The water heater is supported by a manufacturer's warranty ([refer to page 4](#)). There are a number of factors that will affect the length of service the water heater will provide. These include but are not limited to the water chemistry, the water pressure, the water temperature (inlet and outlet) and the water usage pattern. Refer to ["Precautions"](#) on page 13.



MAINTENANCE REQUIREMENTS

MAJOR SERVICE EVERY FIVE YEARS

It is recommended a major service be conducted on the water heater every five (5) years.

⚠ Warning: Servicing of a water heater must only be carried out by qualified personnel. Phone your Rheem Service Centre.

Note: The major service and routine replacement of any components, such as the anode and relief valve(s), are not included in the Rheem warranty. A charge will be made for this work. Only genuine replacement parts should be used on this water heater.

The major service includes the following actions:

- Replace the temperature pressure relief valve.
- Inspect and flush the expansion control valve (if fitted). If required, replace the valve.
- Inspect and if required, replace the anode.
If the anode is not replaced, it should be replaced within five (5) years of this service (refer to "[Anode Inspection and Replacement](#)" on page 18).
- Check the electric heating unit for excessive calcium build-up or corrosion and replace if necessary.
- Visually check the unit for any potential problems.
- Inspect all connections.
- Check the drain line from the safe tray (if one is installed) is not blocked.

Note: The water heater may need to be drained during this service. After the completion of the service, the water heater will take some time to reheat the water.



MAINTENANCE REQUIREMENTS

MINOR MAINTENANCE EVERY SIX MONTHS

It is recommended minor maintenance be performed every six (6) months. Minor maintenance can be performed by the dwelling occupant.

The minor maintenance includes:

- Operate the easing lever on the temperature pressure relief valve. **It is very important the lever is raised and lowered gently.** Refer to “Relief Valves” on page 9.

⚠ Warning: Water discharged from the temperature pressure relief valve drain line will be hot. Exercise care to avoid any splashing of water by standing clear of the drain line’s point of discharge when operating the valve’s easing lever.

- Operate the easing lever on the expansion control valve (if fitted). **It is very important the lever is raised and lowered gently.** Refer to “Relief Valves” on page 9.
- Check the drain line from the safe tray (if one is installed) is not blocked.



WATER SUPPLIES

This water heater must be installed in accordance with this advice to be covered by the Rheem warranty.

This water heater is manufactured to suit the water conditions of most public reticulated water supplies. However, there are some known water chemistries which can have detrimental effects on the water heater and its operation and / or life expectancy. If you are unsure of your water chemistry, you may be able to obtain information from your local water supply authority. This water heater should only be connected to a water supply which complies with these guidelines for the Rheem warranty to apply.

CHANGE OF WATER SUPPLY

The changing or alternating from one water supply to another can have a detrimental effect on the operation and / or life expectation of a water heater cylinder, a temperature pressure relief valve and a heating unit.

Where there is a changeover from one water supply to another, e.g. a rainwater tank supply, bore water supply, desalinated water supply, public reticulated water supply or water brought in from another supply, then water chemistry information should be sought from the supplier or it should be tested to ensure the water supply meets the requirements given in these guidelines for the Rheem warranty to apply.

ANODE

The vitreous enamel lined cylinder of the 312025 water heater is supplied with a black colour coded anode and is only covered by the Rheem warranty when the total dissolved solids (TDS) content in the water is from 40 mg/L to 600 mg/L.

The changing of an anode must be carried out by a qualified person.

Note: Some water analysis reports may state the conductivity of the water rather than the level of total dissolved solids. Conductivity, measured in microsiemens per centimetre ($\mu\text{S} / \text{cm}$), is directly proportional to the TDS content of the water. TDS, in mg / L, is approximately 70% of the conductivity in $\mu\text{S} / \text{cm}$.



WATER SUPPLIES

ANODE INSPECTION AND REPLACEMENT

The anode installed in your water heater will slowly dissipate whilst protecting the cylinder. The life of the cylinder may be extended by replacing the anode.

For water supplies which are either softened or desalinated, or where the water supply may alternate between a water tank and a reticulated public supply or another supply, or where there is a variable supply (e.g. from a bore or public reticulated supply from various water sources), the anode must be inspected (and replaced if there is any sign of depletion) within five (5) years of its installation, and within every three (3) years thereafter.

For all water supplies, if the anode is not replaced during a major service (refer to **“Major Service Every Five Years”** on page 15) then the maximum time after installation when the anode should be replaced for this water heater is ten (10) years.

CAUTION

If the water supply has a TDS greater than 600 mg/L, there is the possibility the anode may become overactive and hydrogen gas could accumulate in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (automatic washing machines and dishwashers) which are connected to the hot water supply.

The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flame near the tap whilst it is turned on. Any hydrogen gas will be dissipated. This is indicated by an unusual spurting of the water from the tap. Once the water runs freely, any hydrogen in the system will have been released.



WATER SUPPLIES

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. The saturation index figures stated are calculated using a water temperature of 80°C.

In a corrosive water supply, the water can attack copper parts and cause them to fail. Where the saturation index is less than -1.0 , the water is very corrosive and the Rheem warranty does not apply to a copper sheathed heating unit. A corrosion resistant heating unit must be used for the Rheem warranty to apply to the heating unit.

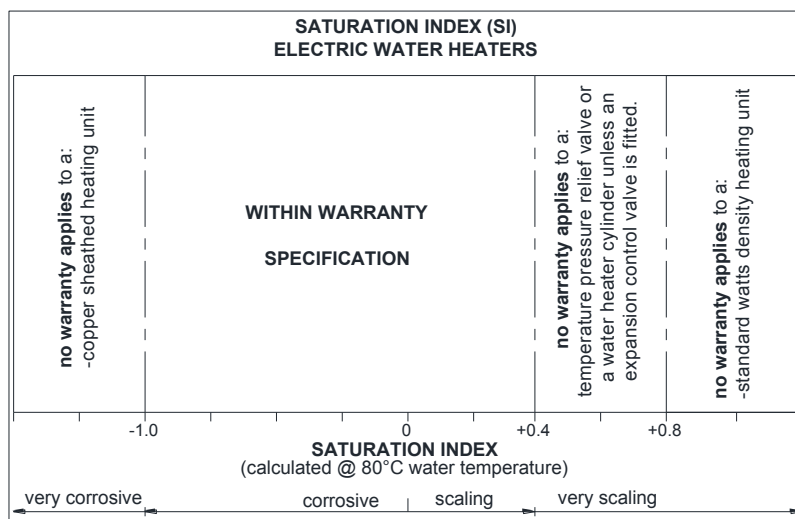
In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. Where the saturation index exceeds $+0.40$, the water is very scaling. An expansion control valve must be fitted on the cold water line after the non-return valve to protect and for the Rheem warranty to apply to the temperature pressure relief valve and water heater cylinder.

Where the saturation index exceeds $+0.80$, the Rheem warranty does not apply to a standard watts density heating unit. A low watts density heating unit must be used for the Rheem warranty to apply to the heating unit.

Water which is scaling may be treated with a water softening device to reduce the saturation index of the water.

Refer to the [Saturation Index chart](#) on page 19. Refer to the [cold water connection detail on page 32](#) for the position of the expansion control valve.

Contact your Rheem Service Centre if a replacement heating unit is required.





WATER SUPPLIES

SUMMARY OF WATER CHEMISTRY ADVICE AFFECTING WARRANTY

The water heater and its components are not suitable for certain water chemistries. Those chemistries are listed below. If the water heater is connected at any time to a water supply with the following water chemistry, the Rheem warranty will not cover any resultant faults on the components listed below:

Water Chemistry	Component
Total Dissolved Solids (TDS) > 600 mg/L (black colour coded anode installed)	water heater cylinder
Total Dissolved Solids (TDS) < 40 mg/L (black colour coded anode installed)	water heater cylinder
Saturation Index (SI) < -1.0	copper sheathed heating unit
Saturation Index (SI) > +0.4 (if expansion control valve is not fitted)	water heater cylinder temperature pressure relief valve
Saturation Index (SI) > +0.8	standard watts density heating unit



SAVE A SERVICE CALL

Check the items below before making a service call. You will be charged for attending to any condition or fault that is not related to the manufacture or failure of a part.

NOT ENOUGH HOT WATER (OR NO HOT WATER)

- **Is the electricity switched on?**

Inspect the isolating switch marked "HOT WATER" or "WATER HEATER" at the switchboard and the isolating switch (if one is installed) near the water heater and ensure they are turned on.

Check the fuse or circuit breaker marked "HOT WATER" or "WATER HEATER" at the switchboard.



- **Are you using more hot water than you think?**

Is one outlet using more hot water than you think? Very often it is not realised the amount of hot water used.

Carefully review the family's hot water usage. Have a plumber fit a flow control valve to each outlet to reduce water usage.

- **Relief valve running**

Is the relief valve discharging too much water?

Refer to "Temperature Pressure Relief Valve or Expansion Control Valve Running" on page 22.

- **Thermostat setting**

Ensure the thermostat setting is appropriate. You may choose to have a licensed electrical worker check and adjust the thermostat upwards to gain additional hot water capacity.

Refer to "Temperature Adjustment" on page 13.

⚠ Warning: Hotter water increases the risk of scald injury.

- **Water heater size**

Do you have the correct size water heater for your requirements?

The sizing guide in the Rheem sales literature and on the Rheem website (www.rheem.com.au) suggests average sizes that may be needed.

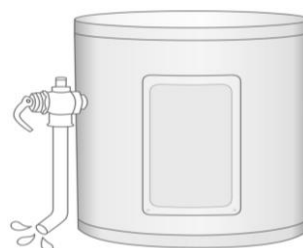


SAVE A SERVICE CALL

TEMPERATURE PRESSURE RELIEF VALVE OR EXPANSION CONTROL VALVE RUNNING

- **Normal Operation**

It is normal and desirable the temperature pressure relief valve or expansion control valve (if fitted) allows a quantity of water to escape during the heating cycle. This quantity should be equal to approximately 1/50 of the hot water used, as water expands by this volume when heated. However, if it discharges more than a bucket full of water in 24 hours, there may be another problem.



The expansion control valve will discharge water instead of the temperature pressure relief valve as it has a lower pressure rating. A benefit is that energy is conserved as the discharged water is cooler. This valve is installed in the cold water line to the water heater (refer to the **cold water connection diagram** on page 32).

- **Continuous dribble**

Try gently raising the easing lever on the relief valve for a few seconds (refer to **"Relief Valves"** on page 9). This may dislodge a small particle of foreign matter and clear the fault. Release the lever gently.

- **Steady flows for long period (often at night)**

This may indicate the mains water pressure sometimes rises above the designed pressure of the water heater. Ask your installing plumber to fit a pressure limiting valve.

⚠ Warning: Never replace the relief valve with one of a higher pressure rating.

- **Heavy flows of hot water from the temperature pressure relief valve until water heater is cold - then stops until water reheats**

The water heater **must** be switched off at the switchboard. Phone your Rheem Service Centre to arrange for an inspection.



SAVE A SERVICE CALL

HIGHER THAN EXPECTED ELECTRICITY BILLS

Should you at any time, feel your electricity bill is higher than expected, we suggest you check the following points:

- Is the relief valve running excessively?

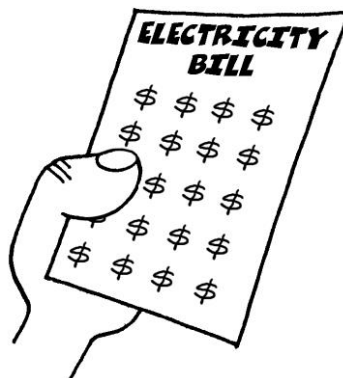
Refer to “Temperature Pressure Relief Valve or Expansion Control Valve Running” on page 22.

- Is one outlet using more hot water than you think?

Refer to “Not Enough Hot Water” on page 21.

- Is there a leaking hot water pipe, dripping hot water tap, etc?

Even a small leak will waste a surprising quantity of hot water and electricity. Replace faulty tap washers, and have a plumber rectify any leaking pipe work.



- Has there been an increase in hot water usage?

An increase in hot water usage will result in an increase in water heater operation.

- Has your water heating tariff rate been increased by your electricity retailer since your previous bill?

ELECTRICITY TARIFFS

The electricity tariff to which your water heater is connected will determine the overall operating cost of the system. It is important you are aware of this tariff, i.e. Domestic / Continuous or Time of Use.

IF YOU HAVE CHECKED ALL THE FOREGOING AND STILL BELIEVE YOU NEED ASSISTANCE, PHONE YOUR RHEEM SERVICE CENTRE.



INSTALLATION

THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING

INSTALLATION STANDARDS

The water heater must be installed:

- by a qualified person, and
- in accordance with the installation instructions, and
- to conform to Clauses G12 and H1 of the New Zealand Building Code, and
- in compliance with Standards AS/NZS 3500.4 and AS/NZS 3000, and all local codes and regulatory authority requirements.

⚠ Warning: – This water heater may deliver water at high temperature. Refer to the New Zealand Building Code, local requirements and these installation instructions to determine if additional delivery temperature control is required. Refer to **“Hot Water Delivery”** on page 26.

All packaging materials must be removed from the water heater prior to its installation. This includes the removal of the cardboard base of the carton from the underside of the water heater.

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

If this water heater is to be used where an uninterrupted hot water supply is necessary for the application or business, then there should be back-up redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater was to become inoperable for any reason. We recommend you provide advice to the system owner about their needs and building back-up redundancy into the hot water supply system.

WATER HEATER LOCATION

The water heater is suitable for either indoor or outdoor installation. Whether located outdoor or indoor, the water heater should be installed close to the most frequently used outlet and its position chosen with safety and service in mind.

Clearance must be allowed for servicing of the water heater. The water heater must be accessible without the use of a ladder or scaffold.

Make sure the temperature pressure relief valve lever is accessible and the front cover, thermostat and heating unit can be removed for service.



INSTALLATION

You must be able to read the information on the rating plate. If possible leave headroom of one water heater height so the anode can be inspected or replaced. Remember you may have to take the entire water heater out later for servicing.

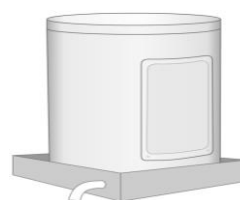
The water heater is to be installed at ground or floor level, or in a suitable cupboard. Alternatively, it may be hung on a wall capable of taking the weight of the filled water heater using a suitable wall bracket and fixings. It must stand vertically upright on a stable base as acceptable to local authorities. The base of the water heater is made of corrosion resistant material, and it may be placed directly in contact with the supporting surface. It is not necessary to allow for free air circulation under the base of the water heater.

Note: The water heater should not be placed in direct contact with a concrete surface that is less than two months old and not fully cured as this may attack the metal coating of the water heater base. A moisture barrier should be used between the two surfaces in this instance. The barrier should extend at least 100 mm from the water heater and may be trimmed after two months.

Remember all local authorities have regulations about putting water heaters into roof spaces.

SAFE TRAY

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed in a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements. The safe tray must also meet the requirements of Clause G12 of the New Zealand Building Code. AS/NZS 3500.4 and the NZBC also have particular requirements when a safe tray must be installed.

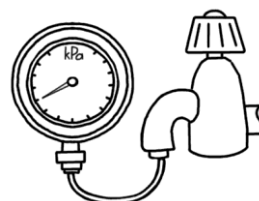


MAINS WATER SUPPLY

Where the mains water supply pressure exceeds that shown in the table below, an approved pressure limiting valve is required and should be fitted as shown in the **cold water connection diagram** on page 32.

Model	312025
Temp press relief valve setting	1000 kPa
Expansion control valve setting*	850 kPa
Maximum mains supply pressure	
With expansion control valve	680 kPa
Without expansion control valve	800 kPa

* Expansion control valve not supplied with water heater





INSTALLATION

TANK WATER SUPPLY

If the water heater is supplied with water from a tank supply and a pressure pump system is not installed, then the bottom of the supply tank must be at least 1 m above the highest point of the hot water plumbing system, including the water heater. Care must be taken to avoid air locks. The cold water line to the water heater should be adequately sized and fitted with a full flow gate valve or ball valve.

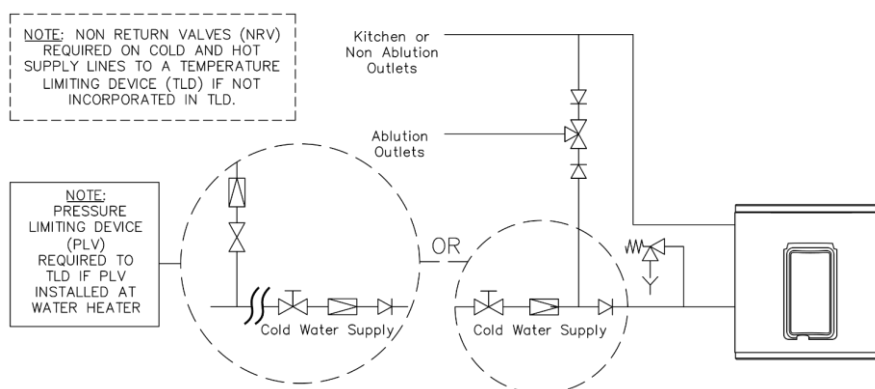
HOT WATER DELIVERY

This water heater can deliver hot water at temperatures up to 70°C depending upon the thermostat setting, sufficiently hot to cause severe scalding. Water at this temperature may be plumbed to fixtures where water hotter than 55°C is allowed, such as the kitchen and laundry.

The installing plumber may have a legal obligation to ensure the installation of this water heater meets the water temperature delivery requirements of Clause G12 of the New Zealand Building Code so that heated water delivered to sanitary fixtures and appliances used primarily for personal hygiene is at a temperature which is unlikely to scald.

It is necessary and we recommend that a temperature limiting device be fitted between a Rheem 312025 model water heater and the fixtures and appliances used primarily for personal hygiene such as in a bathroom, ensuite, public amenities or other ablution areas, to reduce the risk of scalding.

Where a temperature limiting device is installed adjacent to the water heater, the cold water line to the temperature limiting device can be branched off the cold water line either before or after the isolation valve and pressure limiting valve, but must branch off before the non-return valve to the water heater. The expansion control valve must always be installed after the non-return valve and be the last valve prior to the water heater.



Two Temperature Zones Using a Temperature Limiting Device



INSTALLATION

If a pressure limiting valve is installed on the cold water line to the water heater and the cold water line to a temperature limiting device branches off before this valve or from another cold water line in the premises, then a pressure limiting valve of an equal pressure setting may be required prior to the temperature limiting device.

CIRCULATED HOT WATER FLOW AND RETURN SYSTEM

A Rheem 312025 model can be installed as a secondary water heater in the circulated flow and return system and supplied from an Off-Peak or Extended Off-Peak electric, or a heat pump or solar water heater. The flow and return lines connect to the secondary water heater, not the Off-Peak or Extended Off-Peak electric, heat pump or solar water heater. The secondary water heater makes up for the pipe heat loss in the flow and return system.

Note: The thermostat must always be set to maintain a temperature of at least 60°C in the hot water flow and return line, including making up pipe heat losses in the system.

Refer to the **Circulated Hot Water Flow and Return Off-Peak Electric, Heat Pump or Solar Water Heater** diagram on page 28.

Temperature Limiting Device

A temperature limiting device cannot be installed in circulated hot water flow and return pipe work. The tempered water from a temperature limiting device cannot be circulated. Where a circulated hot water flow and return system is required in a building, a temperature limiting device can only be installed on a dead leg, branching off the circulated hot water flow and return pipe.

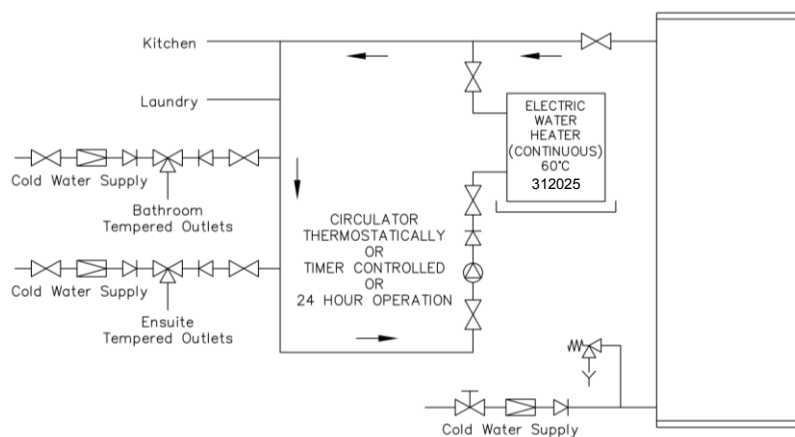
If circulated tempered water were to be returned back to the water heater, depending on the location of the return line connection on the water supply line to the water heater, then either:

- water will be supplied to the cold water inlet of the temperature limiting device at a temperature exceeding the maximum recommended water supply temperature, or
- when the hot taps are closed no water will be supplied to the cold water inlet of the temperature limiting device whilst hot water will continue to be supplied to the hot water inlet of the temperature limiting device.

These conditions may result in either water at a temperature exceeding the requirements of Clause G12 of the New Zealand Building Code being delivered to the hot water outlets in the ablution areas, or the device closing completely and not delivering water at all, or the device failing. Under either condition, the operation and performance of the device cannot be guaranteed.



INSTALLATION



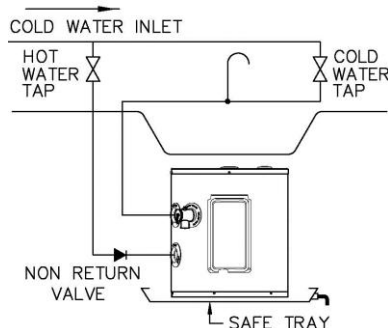
NOTE: A PLV IS REQUIRED TO BE INSTALLED ON THE COLD SUPPLY LINE TO THE TEMPERING VALVE IF A PLV IS INSTALLED ON THE COLD SUPPLY LINE TO THE WATER HEATER.

Circulated Hot Water Flow and Return System Off-Peak Electric, Heat Pump or Solar Water Heater

PUSH THROUGH (FREE OUTLET) INSTALLATION

It can be advantageous to plumb a 312025 model water heater as a Push Through water heater in some cases.

These installations can supply a single point non-tempered non-ablution outlet only. The temperature pressure relief valve supplied with this model **must** be fitted to the water heater.



REDUCING HEAT LOSSES

The cold water line to and the hot water line from the water heater must be insulated in accordance with the requirements of Clauses G12 and H1 of the New Zealand Building Code and AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed.

SEISMIC RESTRAINT

New Zealand Building Code Clause B1.3.2 requires building elements (including storage water heaters) to be adequately supported including support against earthquake forces. This water heater must be restrained to protect against seismic forces.



INSTALLATION

ANODE

The vitreous enamel lined cylinder of the 312025 water heater is supplied with a black colour coded anode and is only covered by the Rheem warranty when the total dissolved solids (TDS) content in the water is from 40 mg/L to 600 mg/L.

If the water supply has a TDS greater than 600 mg/L, there is the possibility the anode may become overactive and hydrogen gas could accumulate in the top of the water heater during long periods of no use. In areas where this is likely to occur, the installer should instruct the householder on how to dissipate the gas safely (refer to “**Caution**” on page 18).

SADDLING PIPE WORK

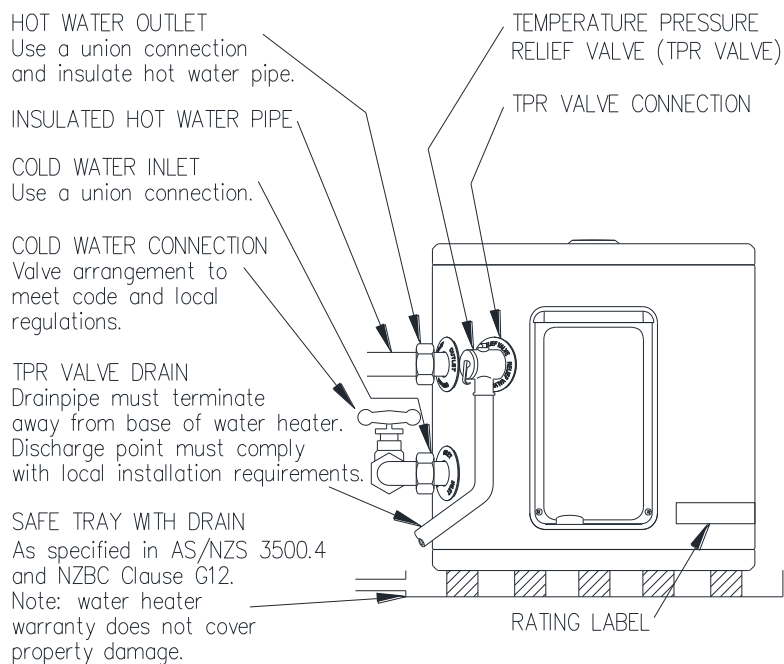
To prevent damage to the cylinder when attaching pipe clips or saddles to the water heater jacket, we recommend the use of self-drilling screws with a maximum length of 13 mm. Should pre-drilling be required, extreme caution must be observed when penetrating the jacket of the water heater.

Note: If the cylinder is damaged as a result of attaching pipe clips or saddles to the jacket, any resultant faults will not be covered by the Rheem warranty.

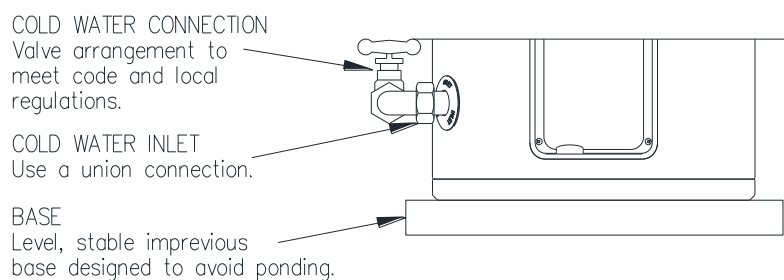


INSTALLATION

TYPICAL INSTALLATION – INDOOR LOCATION

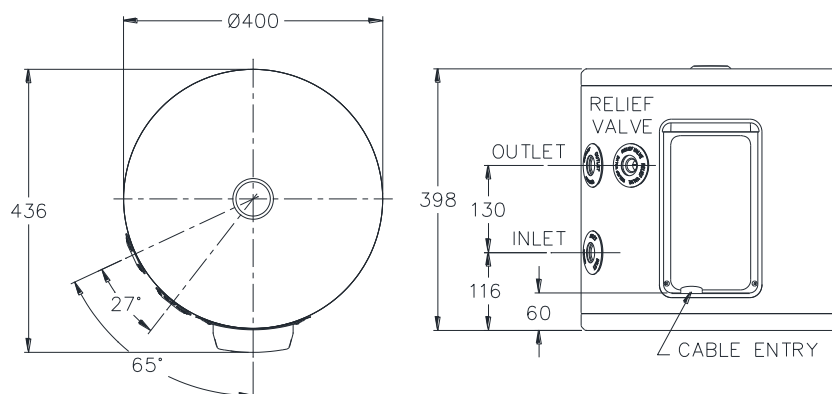


TYPICAL INSTALLATION – OUTDOOR LOCATION





INSTALLATION

DIMENSIONS AND TECHNICAL DATA – RHEEM 312025 MODEL

Model	Storage Capacity	TPR Valve Setting	Approx. Weight empty
31202519V	25 litres	1000 kPa	16 kg

This model is suitable for either indoor or outdoor installation.
 The 312025 model has left hand (LH) water and TPR valve connections.
 Technical data is subject to change.



CONNECTIONS – PLUMBING

All plumbing work must be carried out by a qualified person and in accordance with Clauses G12 and H1 of the New Zealand Building Code, the Standard AS/NZS 3500.4 and all local codes and regulatory authority requirements.

CONNECTION SIZES

- Hot water connection Rp 3/4
- Cold water connection Rp 3/4
- Relief valve connection Rp 1/2

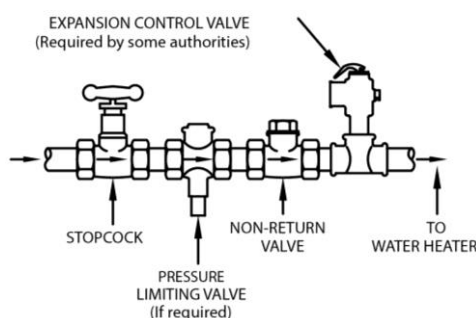
WATER INLET AND OUTLET

The water connections can be made to either side. The Rheem 312025 model water heater has cold and hot water connections on the left hand side.

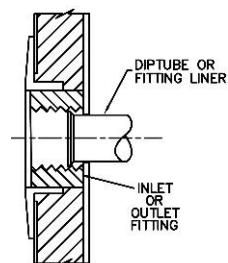
All pipe work must be cleared of foreign matter before connection and purged before attempting to operate the water heater. All olive compression fittings must use brass or copper olives. Use an approved thread sealant such as Teflon tape on all sealing threads.

An isolation valve and non-return valve must be installed on the cold water line to the water heater. An acceptable arrangement is shown in the diagram. Refer also to “**Hot Water Delivery**” on page 26 and to “**Mains Water Supply**” on page 25.

A disconnection union must always be provided at the cold water inlet and hot water outlet on the water heater to allow for disconnection of the water heater.



This water heater has either a plastic dip tube or fitting liner in the inlet and outlet fittings (see diagram). These must be in place for the water heater to function properly. Do not remove or damage them by using heat nearby. They will be pushed into the correct position as the fitting is screwed in.





CONNECTIONS – PLUMBING

This water heater is intended to be permanently connected to the water mains and not connected by a hose-set. A braided flexible hose or semi-flexible connector may be used for connection to the water heater, where permitted by AS/NZS 3500.4.

PIPE SIZES

To achieve true mains pressure operation, the cold water line to the water heater should be the same size or bigger than the hot water line from the water heater.

The pipe sizing for hot water supply systems should be carried out by persons competent to do so, choosing the most suitable pipe size for each individual application. Reference to the technical specifications of the water heater and local regulatory authority requirements must be made.

TEMPERATURE PRESSURE RELIEF VALVE

A 312025 model water heater has a temperature pressure relief valve connection on the left hand side.

The temperature pressure relief valve is shipped in a plastic bag attached to the water heater. The temperature pressure relief valve must be fitted before the water heater is operated. Before fitting the relief valve, make sure the probe has not been bent.

To fit the relief valve:

- Seal the thread with an approved thread sealant such as Teflon tape - never hemp. Make sure tape does not hang over the end of the thread.
- Hand tighten the valve into the selected opening, labelled "Relief Valve" (refer to the [installation diagram](#) on page 30).
- Using a spanner engaged on the valve's spanner flats and applying medium pressure to tighten, turn the relief valve an additional ½ to 1 ½ turns to secure and make the joint water tight, leaving the valve drain pointing downwards.

⚠ Warning: Do not use a pipe wrench or poor fitting tool on the valve body nor over tighten the valve, as this could damage the valve and prevent safe operation.

- Operate the easing lever on the valve to check the smooth operation of the valve plunger. It is very important the lever is raised and lowered gently. The lever should move smoothly and without undue force.

If the lever cannot be moved or is jerky in its movement, then the valve has been damaged and must be replaced.

- A copper drain line must be fitted to the temperature pressure relief valve (refer to ["Relief Valve Drain"](#) on page 35).

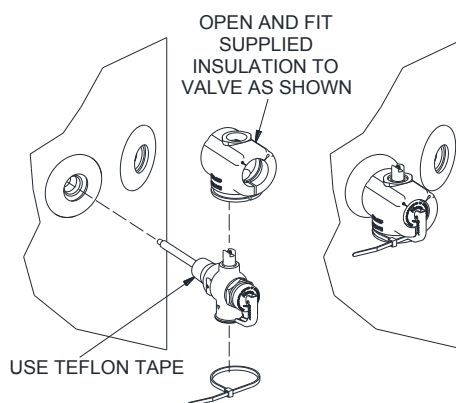


CONNECTIONS – PLUMBING

- The valve must be insulated with closed cell polymer insulation or similar (minimum thickness 9 mm) and the insulation installed so as not to impede the operation of the valve.

The insulation must be weatherproof and UV resistant if exposed.

The preformed insulation collar supplied with the temperature pressure relief valve meets these requirements and must be placed over the body of the valve and secured in position with the cable tie provided after the valve has been fitted to the water heater (refer to the [diagram](#) on page 34).



preformed insulation collar

EXPANSION CONTROL VALVE

It is mandatory to install an expansion control valve (ECV) in the cold water line to the water heater to comply with Clause G12 of the New Zealand Building Code, unless the water heater is installed as a push through installation (refer to ["Push Through \(Free Outlet\) Installation"](#) on page 28).

The expansion control valve must always be installed after the non-return valve and be the last valve installed prior to the water heater (refer to the [cold water connection diagram](#) on page 32). A copper drain line must be fitted to the expansion control valve (refer to ["Relief Valve Drain"](#) on page 35).

The valve, if installed within 500 mm of the water heater, must be insulated with closed cell polymer insulation or similar (minimum thickness 9 mm) and the insulation installed so as not to impede the operation of the valve. The insulation must be weatherproof and UV resistant if exposed.



CONNECTIONS – PLUMBING

RELIEF VALVE DRAIN

DN15 copper drain lines must be fitted to the temperature pressure relief valve and expansion control valve (if one is installed) to carry the discharge clear of the water heater. Connect the drain lines to the valves using disconnection unions. The drain line from the valve to the point of discharge should be as short as possible, have a continuous fall all the way from the water heater to the discharge outlet and have no tap, valves or other restrictions in the pipe work. A drain line from a relief valve must comply with the requirements of AS/NZS 3500.4 and Clause G12 of the New Zealand Building Code.

The length of the drain line in metres plus the number of changes in direction must not exceed twelve (12). For example a drain line nine (9) metres in length can have no more than three bends before discharging at an outlet or air gap. The length of a drain line is to be reduced by one (1) metre for each additional bend required. Where the distance in metres and number of changes in direction to the point of final discharge exceeds twelve (12), the drain line can discharge into a tundish.

In New Zealand the drain lines from the temperature pressure relief valve and expansion control valve from an individual water heater may be interconnected where freezing is unlikely to occur. The combined drain line must have a minimum size of DN20 and discharge via a minimum air gap of a minimum 25 mm.

The outlet of a drain line must be in such a position that flow out of the pipe can be easily seen, but arranged so discharge will not cause injury, damage or nuisance. The termination point of a drain line must comply with the requirements of AS/NZS 3500.4. Drain lines must not discharge into a safe tray.

In locations where water pipes are prone to freezing, drain lines must be insulated, must not exceed 100 mm in length and are to discharge into a tundish through an air gap of a minimum 25 mm.

If a drain line discharges into a tundish, the drain line from the tundish must be not less than DN20 and one size larger than drain line from the relief valve(s). The drain line from a tundish must meet the same requirements as for a drain line from a relief valve.

⚠ Warning: As the function of the temperature pressure relief valve on this water heater is to discharge high temperature water under certain conditions, it is strongly recommended the pipe work downstream of the relief valve be capable of carrying water exceeding 93°C. Failure to observe this precaution may result in damage to pipe work and property.



CONNECTIONS – ELECTRICAL

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory megger reading is obtained.

All electrical work and permanent wiring must be carried out by a qualified person and in accordance with the edition of the Wiring Rules AS/NZS 3000 in force at the time of installation, and all local codes and regulatory authority requirements.

WATER HEATER

The water heater must be directly connected to a 230 V a.c. 50 Hz mains power supply with an isolating switch installed at the switchboard.

The Wiring Rules AS/NZS 3000:2018 requires a second and lockable isolating switch be installed adjacent to but not on or attached to the water heater, and a residual current device (RCD) installed in the electrical circuit to the water heater.

The water heater is suitable for connection to a continuous power supply.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm terminator.

Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. The temperature rating of the power supply wires insulation must suit this application, or the wiring protected by insulating sleeving with an appropriate temperature rating if it can make contact with the internal storage cylinder. The temperature of the internal storage cylinder can reach 70°C under normal operation.

THERMOSTAT SETTING

The thermostat on a Rheem 312025 model water heater is tradesperson adjustable from 60°C to 70°C. The factory setting of the thermostat is 70°C.

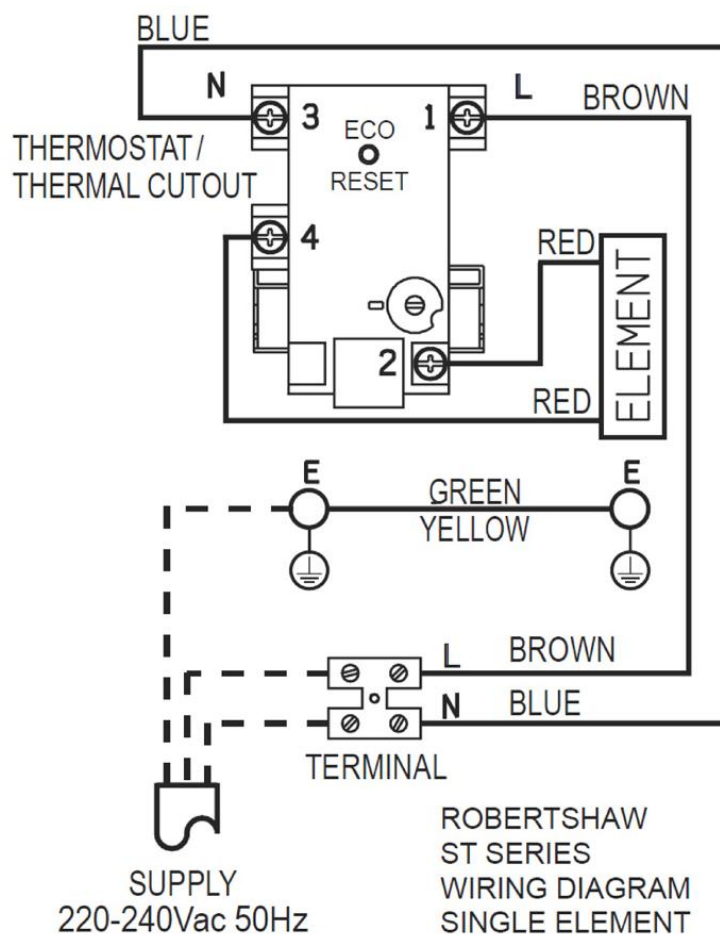
The thermostat is adjusted by turning the adjuster anticlockwise to decrease the temperature setting and clockwise to increase the temperature setting. Only adjust the thermostat setting when the isolating switch is switched off at the switchboard.

For reasons of safety and economy, we advise the thermostat be set at the lowest temperature that will provide sufficient hot water. Discuss the thermostat setting requirements with the householder.



CONNECTIONS – ELECTRICAL

WIRING DIAGRAM SINGLE ELEMENT ELECTRIC WATER HEATERS



Electrical Circuit for Single Element Models – Robertshaw “ST” Thermostat



COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory megger reading is obtained.

- Open all of the hot water taps in the house (don't forget the shower).
- Open the cold water isolation valve fully on the cold water line to the water heater.

Air will be forced out of the taps.

- Close each tap as water flows freely from it.
- Check the pipe work for leaks.
- Inspect for leaks at the temperature pressure relief valve connection to the water heater.

If a leak is detected, close the cold water isolation valve fully and relieve pressure from the water heater by either operating the easing lever on the temperature pressure relief valve or opening a hot tap. Remove the valve and all of its thread sealant from the threads of the valve. Reapply new thread sealant and refit the valve. Refer to the procedure in "**Temperature Pressure Relief Valve**" on page 33.

- Operate the easing lever on the temperature pressure relief valve to check the smooth operation of the valve plunger and that water discharges freely from the drain line. It is very important the lever is raised and lowered gently. The lever should move smoothly and without undue force.

If the lever cannot be moved or is jerky in its movement, then the valve has been damaged and must be replaced.

- Switch on the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).

Explain to the householder or a responsible officer the functions and operation of the water heater. Upon completion of the installation and commissioning of the water heater, leave this guide with the householder or a responsible officer.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).
- Close the cold water isolation valve at the inlet to the water heater.



DRAINING THE WATER HEATER

⚠ Warning: Exercise care, as water discharged from the water heater may be of a very high temperature.

To drain the water heater:

- Turn off the water heater (refer to “To Turn Off The Water Heater” on page 38).
- Close all hot water taps.
- Operate the relief valve lever - do not let the lever snap back or you will damage the valve seat. **It is very important the lever is raised and lowered gently.**

Operating the lever will release the pressure in the water heater.

- Undo the union at the cold water inlet to the water heater and attach a hose to the water heater side of the union.

Let the other end of the hose go to a drain.

- Open the relief valve by holding the lever in the raised position.

This will let air into the water heater and allow the water to drain through the hose.



Revision Date: 2021 July

122283C



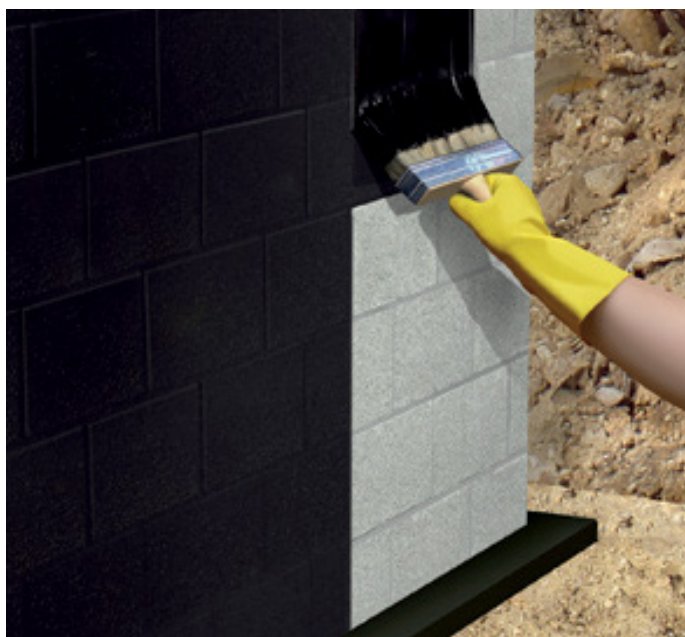
BRANZ Appraised

Appraisal No. 770 [2018]

SIKA BLACKSEAL ELASTIC DAMP PROOF MEMBRANE

Appraisal No. 770 [2018]

This Appraisal replaces BRANZ
Appraisal No. 770 [2012]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



BUILDING TRUST Sika [NZ] Ltd

PO Box 19 192
Avondale
Auckland 1746
Tel: 0800 SIKI NZ
Fax: 0800 SIKI FAX
Web: www.sika.co.nz



BRANZ

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 Sika BlackSeal Elastic is a water-based bitumen emulsion modified with acrylic latex polymer used as a damp proof membrane material behind basement and retaining walls to prevent water vapour penetrating to the interior.

Scope

- 2.1 Sika BlackSeal Elastic has been appraised as a damp-proof membrane behind concrete masonry basement walls complying with NZS 4229.
- 2.2 Sika BlackSeal Elastic has also been appraised for use as a damp-proof membrane on buildings subject to specific design within the following scope:
- where the design of the building will be the responsibility of the building designer; and,
 - with clean, sound, continuous substrates of insitu or precast concrete complying with NZS 3101 or concrete masonry complying with NZS 4210; and,
 - where the membrane is adequately protected against damage during backfilling and in service; and,
 - where subsoil drainage and free draining granular backfill has been placed behind basement walls.
- 2.3 When used to meet the requirements of the New Zealand Building Code this product must be applied by a Licensed Building Practitioner (LBP). The LBP must be trained and registered with Sika [NZ] Ltd.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, Sika BlackSeal Elastic if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years. Sika BlackSeal Elastic meets this requirement. See Paragraph 11.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Sika BlackSeal Elastic meets this requirement. See Paragraphs 12.1 – 12.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Sika BlackSeal Elastic meets this requirement and will not present a health hazard to people.



BRANZ Appraisal
Appraisal No. 770 [2018]
5 December 2018

SIKA BLACKSEAL ELASTIC DAMP
PROOF MEMBRANE

Technical Specification

4.1 Materials Supplied by Sika [NZ] Ltd are:

- **Sika BlackSeal Elastic** is a water-based bitumen emulsion modified with acrylic latex polymer used as a damp proof membrane material behind retaining walls and as a damp proof membrane for underground structures. It is supplied in 4 and 20 litre containers.

Accessories

- **Sika® Deckweb** is a spun bonded polypropylene reinforcement fabric. It is coloured white and is supplied in rolls 190 mm wide x 50 m Long.
- **SikaProof® A - 12 Edge Sheet** is a preformed L-shaped SIKAProof A membrane sheet. It is available in a 1.0 m width folded 500 mm / 500 mm with a self-adhesive strip on both sides. It is coloured light yellow.
- **SikaProof® A Tape - 150** is a self-adhesive tape 150 mm wide for internal sealing and jointing of all detailing and transverse / cross joints.

Handling and Storage

5.1 Handling and storage of all materials whether on or off site is under the control of the installer. Dry storage must be provided for the product and the product must be kept from freezing.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Sika BlackSeal Elastic. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

Substrate Design

- 7.1 Substrate design must be in accordance with the NZBC to a relevant standard, such as NZS 3101 for concrete and NZS 4230 or NZS 4229 for concrete masonry.
- 7.2 The substrate must have a surface finish that is smooth, clean and free from defects or irregularities which may damage the membrane.

Control Joints

8.1 Where control or construction joints are formed in the substrate, Sika [NZ] Ltd must be consulted for use of the membranes over these joints.

Backfilling and Drainage

- 9.1 The membrane must be protected against damage by the placement of a BlackSeal protection sheet between the membrane and the granular fill.
- 9.2 The minimum requirement for backfilling is that a granular, free-draining material is used with the top of the backfill capped with an impervious clay fill that may be covered with topsoil if required. The impervious capping and topsoil must slope at a minimum of 1:30 fall away from the wall.
- 9.3 A minimum 100 mm diameter subsoil perforated drainage pipe must be installed at the bottom of the wall. The pipe must be covered with a geotextile filter fabric, be laid at a minimum 1:200 fall and discharge to a drainage outlet. Provision for cleaning the pipe must also be provided.



BRANZ Appraisal
Appraisal No. 770 [2018]
5 December 2018

SIKA BLACKSEAL ELASTIC DAMP
PROOF MEMBRANE

Durability

Serviceable Life

- 10.1 Sika BlackSeal Elastic is a suitable damp proof membrane material (polymer modified bitumen emulsion), therefore it is expected to have a serviceable life of at least 50 years provided it is installed and maintained in accordance with this Appraisal and is continually protected from sunlight and UV radiation.

Maintenance

- 11.1 Annual inspections must be made of the membrane top edge seal and protection, the backfill capping, and the drainage pipe to ensure all are functioning as originally designed.
- 11.2 If required, the drainage pipe must be cleared to remove any sediment or silt build-up. The slope of the backfill capping must be maintained at all times.

External Moisture

- 12.1 Sika BlackSeal Elastic, when installed in accordance with this Appraisal and the Technical Literature, will prevent water vapour from penetrating to the interior face of basement retaining walls in spaces where moisture may cause damage. The membrane has a vapour flow resistance of not less than 90 MN s/g.
- 12.2 All penetrations and construction joints should be made waterproof following the instructions in the Technical Literature before the application of the membrane. The membrane must be terminated at ground level as set out in the Technical Literature, and protected.
- 12.3 Building designers must ensure junctions with other membranes, such as at the floor/wall junction, form a waterproof joint. Junctions have not been assessed and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

- 13.1 Installation of the membrane must be completed by a Licensed Building Practitioner trained and approved by Sika (NZ) Ltd.

System Installation

Substrate Preparation

- 14.1 Prior to application of the membrane all prepared surfaces must be clean and free from any loose material. Contaminants such as dust, dirt, oil, grease, mould release agents and curing compounds must be removed before application.

Membrane Installation

- 14.2 Sika BlackSeal Elastic can be applied using a coarse whitewash brush, roller or squeegee. Apply two full undiluted coats of Sika BlackSeal Elastic at 2 m² /litre/coat. The second coat must be applied in the opposite direction to the first coat. Backfilling must commence within 48 hours of application of the membrane and BlackSeal protection sheet being installed to ensure the system is not left exposed to sunlight or UV radiation.

Health and Safety

- 15.1 Safe use and handling procedures for the membrane system are provided in the Technical Literature.



BRANZ Appraisal
Appraisal No. 770 [2018]
5 December 2018

SIKA BLACKSEAL ELASTIC DAMP
PROOF MEMBRANE

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

- 16.1 Various testing organisations have tested Sika BlackSeal Elastic for water vapour transmission, adhesion to concrete, low temperature flexibility, sag index resistance, static puncture resistance, storage stability, resistance to re-emulsification, tensile strength and elongation retention before and after heat aging. These have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 17.1 A durability opinion has been given by BRANZ technical experts.
17.2 Practicability of installation has been assessed by BRANZ and found to be satisfactory.
17.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 18.1 The manufacture of the membrane has been examined by BRANZ and details regarding the quality and composition of the materials obtained by BRANZ show the processes to be satisfactory.
18.2 The quality management system of the membrane manufacturer has been assessed to ISO 9001: 2008.
18.3 The quality of materials supplied to the market is the responsibility of Sika [NZ] Ltd.
18.4 Quality of installation on site is the responsibility of the applicator.
18.5 Designers are responsible for the building design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of Sika [NZ] Ltd.
18.6 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Sika [NZ] Ltd.

Sources of Information

- AS/NZS 1170: 2002 Structural and design actions - General principles.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4210: 2001 Masonry construction: Materials and Workmanship.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Design of reinforced concrete masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraisal
Appraisal No. 770 [2018]
5 December 2018

SIKA BLACKSEAL ELASTIC DAMP
PROOF MEMBRANE



In the opinion of BRANZ, **Sika BlackSeal Elastic Damp Proof Membrane** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Sika [NZ] Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Sika [NZ] Ltd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Sika [NZ] Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Sika [NZ] Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

5 December 2018



PRODUCT DATA SHEET

Sika BlackSeal® Elastic

BRANZ APPRAISED LIQUID APPLIED FLEXIBLE BITUMEN DAMP-PROOF MEMBRANE



DESCRIPTION

Sika BlackSeal® Elastic is a BRANZ appraised polymer modified water based bitumen emulsion.

USES

Sika BlackSeal® Elastic has been formulated for use as a waterproof membrane behind retaining walls and as a damp-proof membrane for underground structures. Sika BlackSeal® Elastic can be applied to concrete, concrete block and brick-work, wood and metal.

CHARACTERISTICS / ADVANTAGES

- BRANZ Appraised certificate No.770 [2018]
- Meets Clause B2 Durability, not less than 50 years, E2 External Moisture and F2 Hazardous Building Materials
- Appraised as an Alternative Solution in terms of the New Zealand Building Code
- Improved moisture vapour flow resistance of >300 MNs/g.
- Fast cure, recoat in 4 hours
- Complies with AS/NZS 4020, tested for use in contact with drinking water (potable water)*
- Can be mixed with sand and cement to create water-proof screeds and mortars
- Water based, free from solvents
- Simple to apply by brush or roller
- Excellent adhesion to concrete and masonry
- Very low water permeability
- Can be applied to green concrete
- Resistant to ground salts

APPROVALS / STANDARDS

- BRANZ Appraised certificate No.770 [2018]
- Appraised as an Alternative Solution in terms of the New Zealand Building Code
- Complies with AS/NZS 4020, tested for use in contact with drinking water (potable water)*
- Exceeds the NZS 3604:2011 moisture vapour permeability requirements for a damp-proof membrane. Sika BlackSeal® Elastic has been appraised by BRANZ as a damp-proof membrane behind concrete masonry basement walls, and insitu or precast concrete where the membrane is protected against damage, where drainage has been placed, and installation has been completed by a Licensed Building Practitioner trained and approved by Sika (NZ) Limited. Go to learnhow.sika.co.nz to obtain your application certificate. Refer to BRANZ Appraisal No. 770 (2018).

PRODUCT INFORMATION

Packaging	4 litre and 20 litre containers
Shelf Life	Shelf life is twelve (12) months when stored as stated under "Storage".

Product Data Sheet
Sika BlackSeal® Elastic
May 2022, Version 04.02
020706301000000109



Storage Conditions	Store in original containers in a dry place below 35°C and away from frost.
Colour	Blue/Grey when wet. Black when dry.
Density	1.03 kg/litre
Solid content by weight	60%
Elongation at Break	>1950%
Tensile Adhesion Strength	250 kN/m ²
Permeability to Water Vapour	340 MNs/g

APPLICATION INFORMATION

Consumption	Minimum application rate is 1 litre per m ² (in addition to the primer coat). Ideally this should be applied as two full undiluted coats at a coverage rate of approximately 2m ² / litre / coat, depending on the nature of the surface being treated.
Waiting Time / Overcoating	Recoat time = minimum 4 hours, or longer in cold temperatures.
Drying Time	Touch dry in 1 to 2 hours. Recoat time = minimum 4 hours, or longer in cold temperatures.

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

- Do not expose to sunlight.
- Do not overcoat with paints as staining will occur, and if exposed to sunlight the paint film will crack.
- Sika BlackSeal® Elastic is recommended for use only as described in the "Uses" section of this data sheet.
- *Sika BlackSeal® Elastic is not recommended for use internally on water retaining structures.
- Visit our website to watch the "How to apply Sika BlackSeal Elastic" video. (If you're a NZ LBP, do the short quiz and get your exclusive Sika BlackSeal Elastic certificate.) [Sika® BlackSeal® Elastic](#)

ECOLOGY HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

Visit our website to watch the "How to apply Sika BlackSeal Elastic" video. (If you're a NZ LBP, do the short quiz and get your exclusive Sika BlackSeal Elastic certificate.) [Sika® BlackSeal® Elastic](#)

SUBSTRATE QUALITY

Clean down surface to be treated removing all dust, grease, laitance and foreign matter. Remove any form release agent residues and curing compounds by high pressure waterblasting, grit blasting or mechanical wire brushing. Grind back smooth any dags, sharp edges or ridges. Any surface irregularities should be filled using Sika MonoTop repair mortars or Sikadur-41 epoxy repair mortar. Form a cove where required in internal corners. Stir Sika BlackSeal® Elastic thoroughly before use.

SUBSTRATE PREPARATION

CONTROL JOINTS:

Movement control joints in concrete or concrete masonry should be sealed with Sika BlackSeal®-1 prior to applying Sika BlackSeal® Elastic. However, for joints under pressure, Sikaflex® Tank N should be used. Please note that Sikaflex® Tank N will require an isolation tape such as a pure aluminium foil tape overlay to prevent plasticiser migration from the Sika BlackSeal® Elastic. Refer to the Sika BlackSeal®-1 or Sikaflex® Tank N datasheets for details on joint sizes and application methods. For high movement joints refer to the Sika technical department.

PRIMING: A primer coat of 1 part clean water to 1 part Sika BlackSeal® Elastic should be used. Add water slowly and mix thoroughly. Apply at a rate of approximately 4m²/litre.





LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request. It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

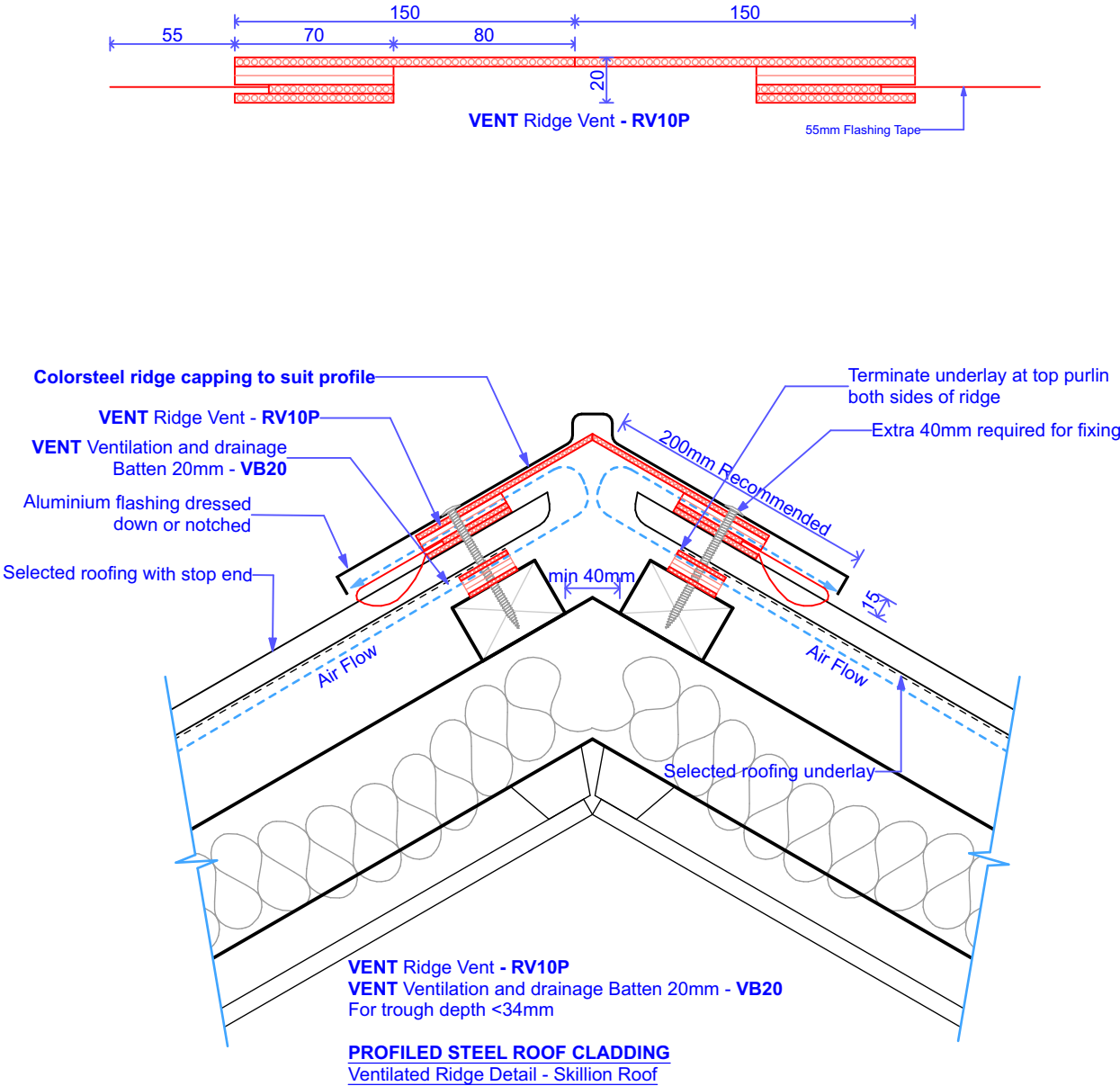
Sika (NZ) Limited
85-91 Patiki Road
Avondale, Auckland 1026
New Zealand
0800 745 269
www.sika.co.nz



Product Data Sheet
Sika BlackSeal® Elastic
May 2022, Version 04.02
020706301000000109

SikaBlackSealElastic-en-NZ-(05-2022)-4-2.pdf





Main contractor to ensure correct placement of purlins for fixing of Ridge Vent

The Ridge cap is to be supplied by the roof cladding supplier.
200mm ridge cap recommended to hide the soft edge flashing (if required)

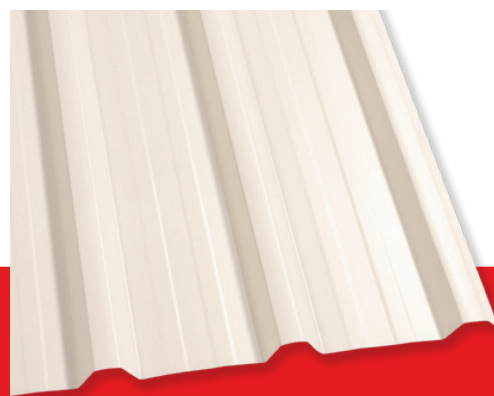
THIS IS A SUGGESTED METHOD OF VENTILATION BUT THE OVERALL DESIGN AND DIMENSIONS ARE THE RESPONSABILITY OF THE DESIGNER IN COMPLIANCE WITH THE NZ BUILDING CODE.

Figure 06 Steel Longrun - Skillion Roof Ridge - RV10P + VB20 Scale 1:5, 1:3	Contact 63 Hull Road, Mount Maunganui Tauranga 07 574 1116 info@vent.nz
---	---



PRODUCT TECHNICAL STATEMENT

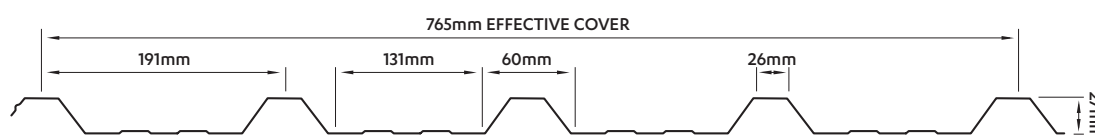
PLUMBDEK®



ROOFING SOLUTIONS

✦ Profiled Metal Roofing and Cladding

NOMINAL DIMENSIONS



INTRODUCTION

Plumbdek® is a low rib, five-ribbed trapezoidal product offering great looks, economy and exceptional performance.

APPLICATIONS

- Residential Roofing and Cladding
- Industrial/Commercial Roofing and Cladding
- Curving

FEATURES

Plumbdek is a very material-effective product with good performance under load.

OPTIONS

Plumbdek can be crimp curved to radii of 400mm and greater. Clear sheeting is available in profiled G.R.P. (fibreglass) to match.

MATERIALS

Available in metallic coated and pre-painted steel in .40mm and .55mm B.M.T. (base metal thickness), aluminium plain and prepainted in .70mm and .90mm, and other non-ferrous metals.

FASTENERS

Typically: Steelfix 12g x 55mm, Timberfix 12g x 65mm, Class 4 minimum, of material compatible with that being fastened and durability no less than the sheet material. Category 5 or non-ferrous fasteners are recommended for severe or very severe marine environments.

DURABILITY

All material selections must be compatible with prevailing environmental conditions and adjacent materials, see New Zealand Steel's *Environmental Categories, Warranty & Product Maintenance Recommendations*. Areas not exposed to rain washing will require programmed maintenance.

WARRANTY PLUS

Steel & Tube **WarrantyPlus** is one of the most comprehensive warranties available in the industry. **WarrantyPlus** covers an extended range of performance criteria, is supported back-to-back by our suppliers, includes site-specific maintenance requirements, and is transferable to subsequent owners.



PRODUCT TECHNICAL STATEMENT › PLUMBDEK

MAR 2018



PERFORMANCE DATA

MASS (KG/M²)

.40mm B.M.T.	4.07	.55mm B.M.T.	5.52
--------------	------	--------------	------

MAXIMUM SPAN

Maximum spans for normal and heavy traffic in millimetres based on point load limits, distributed loads in kPa at maximum spans, using 4 fasteners per sheet per support. Loads for alternative fastener frequencies available on request.

	Material Thickness	Internal Span			End Span		
		Span	Strength Load	Serviceability Load	Span	Strength Load	Serviceability Load
Controlled Traffic*	.40mm	1600	4.37	1.82	1300	5.58	2.37
	.55mm	2400	4.41	1.75	1900	4.77	1.91
Heavy Traffic**	.40mm	1100	7.16	3.08	800	8.15	3.94
	.55mm	1800	6.08	3.31	1400	6.75	3.28

* Supports 1.1kN load to PAN at mid-span.

** Supports 1.1kN load to RIB at mid-span.

To minimise the possibility of roof traffic damage, Steel & Tube recommends Heavy Traffic maximum spans be used.

FASTENERS PER SHEET PER PURLIN

Material Thickness	Purlin Spacing	Wind Zone			
		Low/Medium	High	Very High	EH
.40mm	900	2	2	3	4
	1200	2	3	4	4
.55mm	900	2	2	2	2
	1200	2	2	2	2

Fastener requirements for wind zones according to NZS 3604:2011 (calculated on periphery area pressures), using standard fasteners without load spreading washers. (Typically fasten through every rib to top and bottom purlins.)

For SED conditions and applications designed to AS/NZS 1170 contact Steel & Tube: 0800 333 247.

MINIMUM PITCH

In accordance with Acceptable Solution E2, the minimum pitch for **Plumbdek** for roofing dwellings is 3°.

Roof runs in excess of 40 metres should be checked for water runoff capacity.

FOOT TRAFFIC

Foot traffic up the roof must take place in the pan of the profile, or over purlin lines. Traffic across the roof must take place along purlin lines.

SPECIFICATIONS

Recommended specifications are available in the branded sections of Masterspec, or on our website: www.steelandtube.co.nz.

DESIGN DETAILS

Design details covering many applications are available on our website in CAD and PDF under each product section. Visit www.steelandtube.co.nz.

IMPORTANT PUBLICATIONS

For your installation to perform to its potential, it is essential that it is designed, installed and maintained in accordance with good trade practice. Please refer to:

- Steel & Tube: Roofing Solutions Product Guide
- BRANZ: Good Profiled Metal Roofing Practice
- MRM: New Zealand Metal Roofing and Wall Cladding Code of Practice
- E2/AS1

INSTALLERS

A list of installers for your area is available from your local Steel & Tube branch or visit www.steelandtube.co.nz.



BIM-spec™ is a one stop portal for all Steel & Tube's specification and technical content. It provides access to a large library of 2D and 3D CAD content and building information models (BIM) across a wide range of Steel & Tube product categories. The BIM-spec portal can be accessed through our website www.steelandtube.co.nz

Trademark Note:

Masterspec is a registered trademark of Construction Information Limited.

Plumbdek is a registered trademark of Steel & Tube Holdings Limited.



CALL US TODAY

Technical helpline **0800 333 247**
To purchase our products **0800 427 663**

www.steelandtube.co.nz