

Specification Data Sheet

AUGUST 2016

**DESCRIPTION**

Prepainted ZINCALUME® steel

STANDARD

Substrate manufactured to AS1397:2011

SUBSTRATE COATING CLASS

AZ200

TYPICAL APPLICATIONS

Very severe environments, industrial roofing, wall cladding

STANDARD COLOURS

20 colours

STRIPPABLE FILM

Available on request

BACKING COAT

Perpetual Grey®

MAXX® PHYSICAL PROPERTIES

Pencil hardness

F minimum

Reverse impact resistance (10 joules)

Pass

T-bend test

No tape off

4T minimum

Top coat specular gloss (60° head)

Nominal Range	Tolerance
0-15	± 3
16-80	± 10
80+	Nominal -10

Chalk rating (AS1580: 481.1.11, 1998)

≤4 (10 years exposure)

Colour retention (CIE Lab units, Delta E)

8 units (maximum) – 10 years exposure

10 units (maximum) – 15 years exposure

**DESCRIPTION**

Prepainted ZINCALUME® steel

STANDARD

Substrate manufactured to AS1397:2011

SUBSTRATE COATING CLASS

AZ150

TYPICAL APPLICATIONS

Roofing, cladding, rainwater goods, garage doors, fence panels

STANDARD COLOURS

20 colours

STRIPPABLE FILM

Available on request

BACKING COAT

Perpetual Grey®

ENDURA® PHYSICAL PROPERTIES

Pencil hardness

F minimum

Reverse impact resistance (10 joules)

Pass

T-bend test

No tape off

4T minimum

Top coat specular gloss (60° head)

Nominal Range	Tolerance
0-15	± 3
16-80	± 10
80+	Nominal -10

Chalk rating (AS1580: 481.1.11, 1998)

≤4 (10 years exposure)

Colour retention (CIE Lab units, Delta E)

8 units (maximum) – 10 years exposure

10 units (maximum) – 15 years exposure

Zincalume®

Description

Steel base hot dip coated with a 45% zinc, 55% aluminium alloy coating

Standard

Manufactured to AS1397:2011

Typical applications

Roofing, cladding rainwater goods, air conditioning, garage doors

ZINCALUME® AVAILABILITY

Grades

G300, G550

Thickness (BMT)

0.33 – 1.15mm

Width

70 – 1230mm

ZINCALUME® COATING

Coating type

AZ (naturally small spangle)

Coating mass – standard (g/m²)

150

GALVSTEEL®

Description

Steel base hot dip coated with a zinc coating

Standard

Manufactured to AS1397:2011

Typical applications

Roofing, cladding, drums and tubes, purlins, air conditioning, culverts, sheet metal work, concrete form work

GALVSTEEL® AVAILABILITY

Grades

G1, G250, G300, G450, G500, G550

Thickness (BMT)

G1, G250: 0.30 – 2.00mm

G300, G550: 0.30 – 1.00mm

G500: 1.01 – 1.49mm

G450: 1.50 – 2.00mm

Width

70 – 1230mm

GALVSTEEL® COATING

Coating type

Z (regular spangle)

Coating mass – standard (g/m²)

100, 200, 275, 450, 600

FABRICATION PERFORMANCE FOR ZINCALUME® AND GALVSTEEL®

PROCESS	GRADE G1/G250/G300	GRADE G450/G500/G550
Bending	Excellent	Limited
Drawing	Fair	Not recommended
Pressing	Limited	Not recommended
Roll-Forming	Excellent	Excellent
Painting	Excellent	Excellent

NOTE: Not all combinations of grade, thickness and width are readily available. Please discuss your specific requirements with your steel supplier or New Zealand Steel.

For more information about NEW ZEALAND STEEL products call **0800 100 523** or visit **nzsteel.co.nz**



NOTE: Buyers and users of New Zealand Steel products and services must make their own assessment of the products for their own conditions. All queries regarding product specification, purpose or application should be directed to New Zealand Steel, phone 0800 100 523. New Zealand Steel reserves the right to modify products, techniques, equipment and statements to reflect improvements in the manufacture and application of its products. The information contained in this brochure is supplied without prejudice to New Zealand Steel's standard terms and conditions of sale. In the event of conflict between this information and the standard terms and conditions, the standard terms and conditions prevail. COLORSTEEL® and GALVSTEEL® are registered trademarks of New Zealand Steel Limited. ZINCALUME® is a registered trademark of BlueScope Steel Limited.

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BRANZ Appraised
Appraisal No. 943 [2021]

THERMAKRAFT COVERTEK 401 ROOF UNDERLAY

Appraisal No. 943 [2021]

This Appraisal replaces BRANZ
Appraisal No. 943 [2016]

Amended 09 January 2023



BRANZ Appraisals

Technical Assessments of products for
building and construction.



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Product

- 1.1 Thermakraft Covertek 401 Roof Underlay is a non-fire-retardant, synthetic, self-supporting building underlay for use under roof claddings.

Scope

- 2.1 Thermakraft Covertek 401 Roof Underlay has been appraised for use as a roof underlay on buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
 - the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
 - with masonry tile roof cladding; and,
 - with metal tile roof cladding; and,
 - with profiled metal roof cladding; and,
 - situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, Thermakraft Covertek 401 Roof Underlay, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years, B2.3.1 [b] 15 years and B2.3.2. Thermakraft Covertek 401 Roof Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the roof cladding system, Thermakraft Covertek 401 Roof Underlay contributes to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Covertek 401 Roof Underlay meets this requirement.

Technical Specification

- 4.1 Thermakraft Covertek 401 Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous, water-resistant film, ultrasonically bonded to two layers of non-woven spun-bonded polyolefin. Thermakraft Covertek 401 Roof Underlay is coloured white or light grey.
- 4.2 The product is supplied in rolls 1.35 m wide x 18.6, 37 and 55 m long, and 2.7 m wide x 33.4 m long. The product is printed with the Thermakraft Covertek 401 logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

Accessories

- 4.3 Accessories used with Thermakraft Covertek 401 Roof Underlay which are supplied by the installer are:
- **Fixings** - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

Handling and Storage

- 5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Installation Guide, Thermakraft™ Covertek 401, Issue 3.0, dated September 2022.
 - Product Data Sheet, Thermakraft™ Covertek 401, Issue 7.0, dated September 2022.
- 6.2 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

General

Timber and Steel Framing

- 7.1 Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.

General

- 7.2 Thermakraft Covertek 401 Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel-framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.
- 7.4 Thermakraft Covertek 401 Roof Underlay must not be exposed to the weather or ultraviolet (UV) light for a total of more than 7 days before being covered by the roof cladding.
- 7.5 Thermakraft Covertek 401 Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 for timber-framed buildings or NASH Building Envelope Solutions, Table 23 for steel-framed buildings. Refer to Table 1.

Table 1: Material Requirements

NZS 2295 Property	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	$\leq 0.5\%$	Pass

- 7.6 Thermakraft Covertek 401 Roof Underlay is suitable for use at roof pitches 3° and above. When used at pitches less than 10° , Thermakraft Covertek 401 Roof Underlay can be installed horizontally when spanning no greater than 1,200 mm in one direction, or it can be installed vertically when fully supported by a corrosion resistant material.
- 7.7 At pitches 10° and greater, Thermakraft Covertek 401 Roof Underlay can be installed vertically or horizontally and must span no greater than 1,200 mm in one direction.
- 7.8 At roof pitches less than 10° (minimum 3°), Thermakraft Covertek 401 Roof Underlay may be run horizontally, or vertically if installed over a roof underlay support.
- 7.9 Refer to Table 2 for a summary of the roof underlay support requirements.

Table 2: Roof Underlay Support Requirements

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 1,200 mm	Yes	Yes
	1,200 mm or less	No	No
Less than 10° (minimum 3°)	Greater than 1,200 mm	Yes	Yes
	1,200 mm or less	No	Yes

Structure

- 8.1 Thermakraft Covertek 401 Roof Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High or NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Durability

- 9.1 Thermakraft Covertek 401 Roof Underlay meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b) 15 years for roof underlays used where the roof cladding durability requirement is 15 years.

Serviceable Life

- 9.2 Provided it is not exposed to the weather or UV light for a total of more than 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Thermakraft Covertek 401 Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.

Control of Internal Fire and Smoke Spread

- 10.1 Thermakraft Covertek 401 Roof Underlay has an AS 1530 Part 2 flammability index of greater than 5. For Risk Groups other than SH, Thermakraft Covertek 401 Roof Underlay must be enclosed by a suitable internal lining in occupied spaces (not exposed to view).

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Thermakraft Covertek 401 Roof Underlay from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and NZBC Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 12.1 Thermakraft Covertek 401 Roof Underlay must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or roof claddings covered by a valid BRANZ Appraisal.
- 12.2 Thermakraft Covertek 401 Roof Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirement

- 13.1 All design and building work must be carried out in accordance with the Thermakraft Covertek 401 Roof Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with Thermakraft Covertek 401 Roof Underlay. Where the work involves Restricted Building Work [RBW] this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License class.

Underlay Installation

- 14.1 Thermakraft Covertek 401 Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self-drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Thermakraft Covertek 401 Roof Underlay may be installed horizontally or vertically at roof pitches 3° and above [refer to Paragraph 7.1 for further guidance]. It must extend from the ridge and overhang the fascia board by 20-25 mm. Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Thermakraft Covertek 401 Roof Underlay has a 150 mm lap line printed continuously along the top face.
- 14.3 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.4 Any damaged areas of Thermakraft Covertek 401 Roof Underlay, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

- 14.5 The Technical Literature must be referred to during the inspection of Thermakraft Covertek 401 Roof Underlay installations.

Basis of Appraisal

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

Tests

- 15.1 The following tests have been carried out on Thermakraft Covertek 401 Roof Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 and NASH Building Envelope Solutions: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6 and pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after the underlays were exposed to UV light.

Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Thermakraft Covertek 401 Roof Underlay in direct contact with metal roof cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Thermakraft Covertek 401 Roof Underlay has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

- 17.1 The manufacture of Thermakraft Covertek 401 Roof Underlay has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the roof underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test - Surface water absorbency.
- NASH Building Envelope Solutions:2019 Light steel-framed buildings.
- NASH Standard Part Two:2019 Light steel-framed buildings.
- NZS 3604:2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 09 January 2023.

This Appraisal has been amended to update the product name, company name, and technical literature.



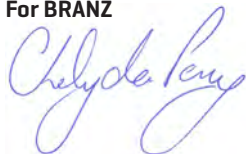
In the opinion of BRANZ, **Thermakraft Covertek 401 Roof Underlay** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Kingspan Insulation NZ Limited**, 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. **Kingspan Insulation NZ Limited:**
 - 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 **Kingspan Insulation NZ Limited**.
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 **Kingspan Insulation NZ Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

01 December 2021

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

1.0 - Product Overview

EXPOL ThermaSlab (Expanded Polystyrene / EPS) provides excellent compressive strength, moisture resistance, and thermal protection.

Ideally suited for residential applications, **EXPOL ThermaSlab** is a cost effective, easy to install insulation solution that achieves R-values above building regulations.

EXPOL ThermaSlab is available in grades S, M, H, VH and SL, and can be used in:

- Retaining Walls (S Grade)
- Skillion Roof Insulation (S, M H Grades)
- Concrete Floor Insulation (S, H, VH Grades)
- Wall Insulation (SL Grade)
- Cladding Insulation (S and H Grades)



2.0 - Installation

2.1 There are no special requirements for PPE when handling or installing EPS. It is an inert, non-toxic material.

2.2 When transporting, storing or installing, ensure the EPS is not exposed to:

- Petroleum based solvents, or
- Fire, or
- Sustained direct sunlight.

2.3 PVC sheathed electrical cables should not be allowed direct contact with EPS.

2.4 EPS is compatible with all common construction products.

3.0 - Maintenance

3.1 No maintenance required

For further technical information please contact us.

P: +64 9 634 3449 F: +64 9 634 0756 T: 0800 86 33 73 E: tech@expol.co.nz W: www.expol.co.nz

4.0 - Warranty

We believe we manufacture and supply the highest quality UnderFloor, EPS and XPS Foam Insulation products and that is why we stand behind them with some of the best warranties in the industry.

4.1 We provide a 20-year warranty on our EPS Foam Insulation Products – for full warranty details visit www.expol.co.nz/expol-eps-warranty/

5.0 - Compliance with the New Zealand Building Code

EPS, when installed and maintained in accordance with the requirements outlined in this technical data sheet, will meet or contribute to meeting the following provisions of the New Zealand Building Code:

- 5.1 Clause B2 Durability, performance B2.3.1 (a), B2.3.1(b)
- 5.2 Clause E3 Internal moisture performance E3.3.1
- 5.3 Clause F2 Hazardous building materials performance F2.3.1(a)

EXPOL EPS is not subject to a warning or ban under the Building Act 2004.

6.0 - Quality Assurance

- 6.1 BRANZ, H1 Energy efficiency performance H1.3.1(a), H1.3.2(e)

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

7.0 - Technical Data

Properties	Test / Method / Standard	Test Results
Material	Expanded Polystyrene	
Density	16 kg / m ³	
Sheet Size	2400 mm x 1200 mm	
Thickness / R Value	10mm	-
	20mm	R 0.53
	25mm	R 0.66
	30mm	R 0.79
	35mm	R 0.92
	40mm	R 1.05
	45mm	R 1.18
	50mm	R 1.32
	55mm	R 1.45
	60mm	R 1.58
	65mm	R 1.71
	70mm	R 1.84
	75mm	R 1.97
	80mm	R 2.11
	85mm	R 2.24
	90mm	R 2.37
	95mm	R 2.50
	100mm	R 2.63
	110mm	R 2.89
	120mm	R 3.16
Thermal Conductivity	ATSM 168	K – Value 0.038
Rate of water vapour transmission (max) measured parallel to rise at 23 deg C	AS 2498.5	520 mg/m ² s
Permeability m/s	-	
Compressive Resistance KPA at 1%	AS 2498.3	34 KPA
Compressive Resistance KPA at 2%		59 KPA
Compressive Resistance KPA at 5%		74 KPA
Compressive Resistance KPA at 10%		84 KPA
Youngs Modulus	-	3.8 MPA
Cross breaking strength KPA	AS 2498.4	165 KPA
Dimensional stability of length, width & thickness (max) at 70 deg C for 7 days	AS2498.6	1%
Long term water absorption by immersion	ASTM C72	- %v / v
Determination of flame propagation surface ignition	AS2122.1-1993	
Medium flame duration (max)		2 sec
Eighth vale		3 sec
Fire behavior	AS/NZS 1530.3:1999	
Spread of flame index (0 – 10)		0
Smoke developed index (0 – 10)		5
Recycled Content	5%	
Recyclability	EPS is 100% recyclable	
Environmental Statement	EPS is inert and non-toxic. There are no chemicals or gases harmful to the environment emitted from EPS either during manufacture or within use.	
Ozone Depleting Potential	EPS does not contain ozone-depleting CFC or HCFC gases, nor use them in its manufacture. As a result, EPS has zero ozone depletion potential.	
Vermin Resistance	EPS does not offer any nutritive value.	

For further technical information please contact us.

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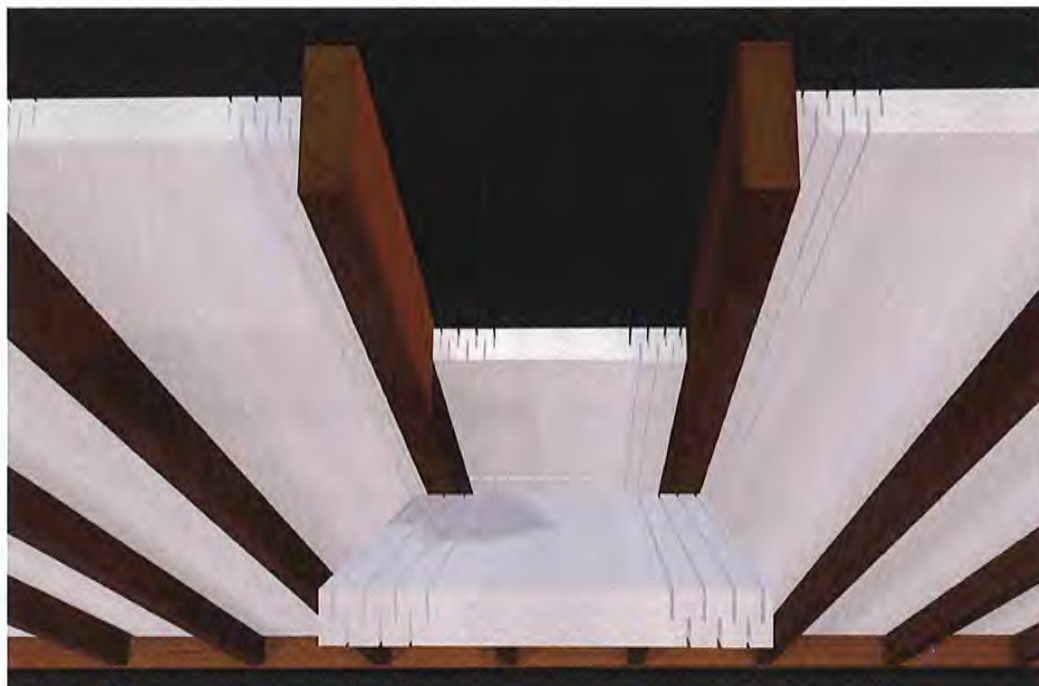
BRANZ Appraised

Appraisal No. 256 [2020]

EXPOL UNDERFLOOR INSULATION

Appraisal No. 256 [2020]

This Appraisal replaces Appraisal No. 256 [2014].



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 EXPOL Underfloor Insulation is an Expanded Polystyrene [EPS] foam board for use as a thermal insulation for timber frame floors. The insulation is pre-cut and compressed to fit a range of flooring joist spacings.

Scope

- 2.1 EXPOL Underfloor Insulation has been appraised as a thermal insulation material:
- for timber framed floors in new or existing domestic and commercial buildings, and
 - for use under floors which have an enclosed perimeter foundation as defined in NZS 4246, or
 - for exposed subfloors and subfloors with wind exposure when clips are used to secure the insulation.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, EXPOL Underfloor Insulation, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [b] not less than 15 years, and B2.3.1 [c] 5 years. EXPOL Underfloor Insulation will meet these requirements. See Paragraphs 8.1 and 8.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. EXPOL Underfloor Insulation meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a] and H1.3.2 E. EXPOL Underfloor Insulation will contribute to meeting these requirements. See Paragraph 13.1.

Technical Specification

Description

- 4.1 EXPOL Underfloor Insulation is Expanded Polystyrene (EPS) foam boards with pre-cut concertina cuts to both edges. EXPOL Underfloor Insulation is available as set out in Table 1.

Table 1: EXPOL Underfloor Insulation product range.

R-value	Nominal Thickness [mm]	Width [mm]	Length [mm]	Pieces per Bag
R1.4	60	360	1200	12
R1.4	60	410	1200	11
R1.4	60	470	1200	10
R1.4	60	560	1200	9

- 4.2 EXPOL Underfloor Insulation is white in colour and is supplied in colour coded packaging to identify the different widths.
- 4.3 EXPOL Underfloor Insulation is manufactured from flame retardant bead to meet the manufacturing requirements of AS 1366.3.
- 4.4 Accessories used with EXPOL Underfloor insulation, which are supplied by the insulation installer, are nylon brackets and stainless steel nails as an optional method of fixings.

Handling and Storage

- 5.1 EXPOL Underfloor Insulation must be stored under cover and out of sunlight. Heavy objects must not be stacked on the packs.
- 5.2 EXPOL Underfloor Insulation is able to get wet before the installation process, but it is recommended that the product is dry during installation against the underfloor or before flooring is fitted.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for EXPOL Underfloor Insulation. 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

General

- 7.1 EXPOL Underfloor Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. EXPOL Underfloor insulation has an R-value of 1.4 m²C/W and are designed to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. For construction R-values, refer to BRANZ House Insulation Guide.
- 7.2 EXPOL Underfloor Insulation thermal resistance [R-value] has been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.
- 7.3 EXPOL Underfloor Insulation is designed to be compression fitted between floor joists with the option of being clipped in place with a bracket. The panels are supplied in widths to suit most installations, refer to Table 1 for dimensions.
- 7.4 EXPOL Underfloor Insulation when installed following the Technical Literature, is suitable for use in exposed underfloors without a lining. Clips must be used in wind exposed situations.
- 7.5 The building envelope must be constructed to ensure the insulation remains dry throughout the life of the building.
- 7.6 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246.

Electrical Cables

- 7.7 PVC cables must be prevented from direct contact with EXPOL Underfloor insulation. Refer to Paragraph 15.5.

Durability

- 8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of EXPOL Underfloor Insulation both during normal use and maintenance of the building.

Serviceable Life

- 8.2 Where the building is maintained so that provisions of the NZBC E2 and E3 Clauses are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance, EXPOL Underfloor Insulation can expect to have a serviceable life of at least 50 years.
- 8.3 Expol nylon brackets must be used to achieve a 50 year serviceable life.
- 8.4 Nylon support brackets are required to support EXPOL Underfloor Insulation for underfloors that are subjected to wind exposure.

Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of the dampness repaired. The insulation must be dry and the floor framing must be clean, dry and free from all contaminants and mould before refitting the dry insulation.
- 9.2 Regular inspections must be completed to insure that installation integrity is maintained and any dislodged panels are reinstalled.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to EXPOL Underfloor Insulation from heat sources such as fire places, heating appliances, flues, chimneys and recessed luminaries (except classed IC - F). Refer to Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2 and NZBC Verification Method C/VM1.

Control of Internal Fire and Smoke Spread

- 11.1 Where the completed floor system is above an occupied space, the system, including the surface lining product enclosing the EXPOL Underfloor Insulation from the adjacent occupied space, must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solution C/AS1 and C/AS2.

External Moisture

- 12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.
- 12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the lower requirement of either the NZBC Acceptable Solution E2/AS1 Paragraph 10.2[a], or the flooring manufacturer.

Internal Moisture

- 13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.

Energy Efficiency

- 14.1 EXPOL Underfloor Insulation will contribute to meeting the requirements of NZBC Clause H1 Performance H1.3.1[a] and H1.3.2 E through compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraph 7.1.

Installation Information

Installation Skill Level Requirements

- 15.1 Installation of EXPOL Underfloor Insulation must be completed by an Installer with an understanding of insulation installation.

General

- 16.1 Installation of EXPOL Underfloor Insulation must be in accordance with the Technical Literature and this Appraisal. NZS 4246 should be used as a guide for installing insulation into residential buildings.
- 17.1 It is important to achieve a tight friction fit between the edge of the board and the joist. This is achieved by the compression of the pre-cut concertina cuts to the edges of the boards.
- 17.2 All gaps must be filled and a tight fit made at butt joins. Small gaps can be sealed with extra material, or a urethane foam.
- 17.3 EXPOL nylon brackets must be used, in line with the Technical Literature, in exposed floors and wind exposed situations.
- 17.4 EXPOL Underfloor Insulation must be separated from all sources of heat.
- 17.5 PVC cables must be prevented from direct contact with any EXPOL Underfloor Insulation. A physical separation must be provided by running cables around the insulation boards, or by wrapping the cables with separating material supplied by Expol Limited.

Inspections

- 17.6 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of EXPOL Underfloor Insulation installations.

Health and Safety

- 18.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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

Tests

- 19.1 BRANZ has carried out thermal resistance testing of EXPOL Underfloor Insulation in accordance with ASTM C518 as part of the material test evaluation to AS/NZS 4859.1.

Other Investigations

- 20.1 An assessment of the durability of EXPOL Underfloor Insulation has been made by BRANZ technical experts.
- 20.2 The Technical Literature including Installation Instruction have been reviewed by BRANZ and found to be satisfactory.
- 20.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation and to examine completed installations.

Quality

- 21.1 The manufacture of EXPOL Underfloor Insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes were obtained and found to be satisfactory.
- 21.2 Expol Limited is responsible for the quality of the product supplied.
- 21.3 Quality of installation of the product on site is the responsibility of the installer.
- 21.4 Maintenance of the building is the responsibility of the building owner.

Sources of Information

- AS 1366.3: 1992 Rigid cellular plastics sheets for thermal insulation – Rigid cellular polystyrene – Moulded.
- AS/NZS 4859.1: 2006 Materials for the thermal insulation of buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- NZS 4246: 2016 Energy efficiency - Installing bulk thermal insulation in residential buildings.
- NZS 4214: 2006 Methods of determining the total thermal resistance of buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The New Zealand Building Regulations 1992.



In the opinion of BRANZ, **EXPOL Underfloor Insulation** 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 **Expol Limited**, 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. **Expol Limited:**
 - 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 **Expol Limited**.
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 **Expol Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

28 February 2020



BRANZ Appraised

Appraisal No. 621 [2020]

THE MARSHALL WEATHERIZATION SYSTEM

Appraisal No. 621 [2020]

This Appraisal replaces BRANZ
Appraisal No. 621 [2014]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 The Marshall Weatherization System consists of Tekton® Building Wrap, HYDRA Wall Underlay, HYDRA Roof Underlay, Super Stick Tape or Protecto Sill System (flexible flashing tapes), Tekton Seam Tape and TRADE-SEAL. The system is used behind wall cladding systems, under roof claddings and around framed joinery openings as a secondary weather resistant barrier for walls.

Scope

- 2.1 The Marshall Weatherization System has been appraised for use on buildings within the following scope:
- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
 - constructed with steel framing in accordance with NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings; and,
 - with absorbent wall claddings directly fixed to the framing complying with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay and a flexible flashing system; or,
 - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity complying with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay or a rigid wall underlay with flexible underlay over and flexible flashing system; or,
 - with masonry tile roof cladding; and,
 - with metal tile and profiled metal roof cladding; and,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or NASH Building Envelope Solutions for steel framed buildings; and,
 - situated in NZS 3604 Wind Zones up to and including Very High where the flexible wall underlay is directly fixed to the frame, and up to and including Extra High where the underlay is used over rigid wall underlays.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, The Marshall Weatherization System if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years, B2.3.1 [b] 15 years and B2.3.2. The Marshall Weatherization System meets this requirement. See Paragraphs 10.1 - 10.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Marshall Weatherization System contributes to exterior walls and roof cladding systems meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Marshall Weatherization System meets this requirement and will not present a health hazard to people.

Technical Specification

- 4.1 System components supplied by Marshall Innovations Limited are as follows:
- **Flexible wall underlay - Tekton® Building Wrap** is a synthetic breather-type building membrane available in rolls 2740 mm wide and 37 m long or 1370 mm wide and 37 m long. The product is manufactured from coated spun bonded polypropylene.
 - **Flexible wall underlay - HYDRA Wall Underlay** is a synthetic building underlay for use under wall claddings. The product consists of a plain non-woven top scrim and a woven bottom scrim with a polymeric laminated facer supplied in rolls 1.37 m wide x 36.5 m long or 2.74 m wide x 37.0 m long.
 - **Flexible Roof Underlay - HYDRA Roof Underlay** is a heavy duty, spun-bonded, non-woven fabric laminated breathable coating, coloured blue and is supplied in rolls 1.25 m wide x 20 m or 40 m long.
 - **Flexible flashing tape [1] - Super Stick** is a multi-layered, silver, polyester-faced, copolymer self-adhesive tape. The tape is supplied in rolls of 75 mm x 22.86 m, 150 mm x 22.86 m and 200 mm x 22.86 m.
 - **Flexible flashing tape [2] - Protecto Sill System** comprises Protecto Wrap Detail Tape, Protecto Wrap Sill Tape and Protecto Tak spray on primer. Both the tapes are based on modified SBS rubberised asphalt and Protecto Tak is a solvent based spray-on adhesive primer. Protecto Wrap Detail Tape is supplied as a 150 mm wide, 15 m long and 1.0 mm thick roll, Protecto Wrap Sill Tape is supplied as a 75, 150 and 200 mm wide, 30 m long and 0.5 mm thick roll and Protecto Tak is supplied in a 369 g can.
 - **Pipe and Services Penetration Seal - TRADE-SEAL** is an EPDM sleeve bonded to a carrier material of spun-bonded high density polyethylene film 150 micron thick. The carrier material is backed with a self-adhesive layer. TRADE-SEAL is available with various diameter EPDM sleeve sizes to accommodate different size wall penetrations.
 - **Adhesive tape - Tekton® Seam Tape** is a thin polypropylene joining adhesive tape, available in rolls 48 mm wide and 50 m long.

Handling and Storage

- 5.1 All products must be kept clean and dry at all times prior to use by storing under cover so that they are protected from the weather and damage. Rolls of Tekton® Building Wrap, HYDRA Wall Underlay and HYDRA Roof Underlay must be stored on end.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for The Marshall Weatherization System. 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

Timber and Steel Framing

- 7.1 Studs must be provided at maximum 600 mm centres. Dwgangs must be fitted flush between studs at maximum 1200 mm centres.
- 7.2 Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.

General

- 8.1 The Marshall Weatherization System is intended for use behind wall cladding systems and at joinery openings as a secondary defence against water penetration into framing cavities and is intended for use as an alternative to conventional wall underlays.
- 8.2 HYDRA Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 8.3 The system will provide a degree of temporary weather protection during construction. However, it will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed-in. The building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 8.4 The Marshall Weatherization System is suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c]. Refer to Table 1.
- 8.5 HYDRA Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 or NASH Building Envelope Solutions Table 23. Refer to Table 2 for the material properties of HYDRA Roof Underlay.
- 8.6 TRADE-SEAL when used with Tekton® Building Wrap or HYDRA Wall Underlay, provides an alternative solution to the pipes and services penetrations specified in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.3 and Figure 68, or NASH Building Envelope Solutions Paragraph 9.1.10.3 and Figure 63.

Table 1: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property - Tekton Building Wrap	Actual Property - HYDRA Wall Underlay
Absorbency	$\geq 100 \text{ g/m}^2$	Classified as non-absorbent	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	1.15 MN s/g	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass	Pass
pH of Extract	≥ 6 and ≤ 9	9.78 [Note 1]	Pass
Shrinkage	$\leq 0.5\%$	0.10%	Pass
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 228 N Cross direction = 186 N Tensile strength: Machine direction = 4.4 kN/m Cross direction = 3.9kN/m	Edge tear: Machine direction = 191.3 N Cross direction = 145.6 N Tensile strength: Machine direction = 4.53 kN/m Cross direction = 3.32kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass	Pass

Note 1: Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlays performance, or the performance of other materials.

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 0.5 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	≥ 5.5 and ≤ 9	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average] Machine Direction > 166 N Cross Direction > 117 N Tensile Strength [Average] Machine Direction > 6.1kN/m Cross Direction > 4.3kN/m

- 8.7 The Marshall Weatherization System is suitable for use under wall cladding as a wall underlay system in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that it cannot be used with non-absorbent wall claddings in direct fixed installations. The Marshall Weatherization System is also suitable for use under wall cladding as a wall underlay system as called up in NASH building envelope solutions, Table 23 on steel framed buildings, except that it cannot be used with non-absorbent wall claddings in direct fixed installations.
- 8.8 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens. This is to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 or NASH Building Envelope Solutions, Paragraph 9.1.9.5.
- 8.9 When The Marshall Weatherization System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate [generally at least one week] prior to the installation of the system.

Structure

- 9.1 The Marshall Weatherization System is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including Extra High when used as an overlay for rigid building underlays.

Durability

Serviceable Life

- 10.1 The Marshall Weatherization System meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years. This is provided the system is not exposed to the weather for a total time of more than 60 days. The products also must not be exposed to the weather or ultra-violet (UV) light at any time in service.
- 10.2 Provided it is not exposed to the weather or UV light for a total of more than 14 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, HYDRA Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.
- 10.3 The exterior cladding must be maintained weathertight at all times for The Marshall Weatherization System to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

- 11.1 The Marshall Weatherization System has an AS 1530 Part 2 flammability index of 0 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. It may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to The Marshall Weatherization System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 13.1 The system is used to assist the control of moisture behind wall claddings by ensuring moisture which may occasionally penetrate the wall cladding is directed back to the exterior of the building.
- 13.2 The system is suitable for use with wall claddings complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal, and where exposed up to, and including Extra High winds as defined by NZS 3604.

Installation Information

Installation Skill Level Requirements

- 14.1 All design and building work must be carried out in accordance with The Marshall Weatherization System Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays and weatherization system installation. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License class.

System Installation

- 15.1 The system must be installed in accordance with NZBC Acceptable Solution E2/AS1, or when used with BRANZ Appraised wall claddings, in accordance with any instructions given in the Appraisal, along with the instructions given in the Technical Literature.
- 15.2 Tekton® Building Wrap and the Hydra Wall Underlay must be fixed first to the external face of the timber or steel wall framing over all openings in the framing, then cut and dressed into all sides of the openings.

- 15.3 Openings are dressed with lengths of Super Stick or Protecto Sill System Tapes where required and adhered to the Tekton® Building Wrap or HYDRA Wall Underlay. The tape is 'fanned' around the corners onto the face of the Tekton® Building Wrap or HYDRA Wall Underlay and folded over the outside edge of the opening framing. All surfaces must be clean and dry prior to the installation. *[Note: Super Stick requires two layers on the sill.]*
- 15.4 HYDRA Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 15.5 HYDRA Roof Underlay may be run horizontally or vertically. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.
- 15.6 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide.
- 15.7 Any other components of the cladding system or joinery installation, such as sill trays, other flashings or seals should be installed as instructed by the cladding or joinery manufacturer. Note that these components, including cladding systems and joinery have not been assessed and are outside the scope of this Appraisal.

Inspections

- 15.8 The Technical Literature must be referred to during the inspection of The Marshall Weatherization System installations.

Basis of Appraisal

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

Tests

- 16.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.
- 16.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421.
- 16.3 Tests have been carried out on Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes in accordance with ICC Evaluation Service Criteria for Flashing Materials, AC148 (2001). The results have been reviewed by BRANZ experts and found to be satisfactory.
- 16.4 Peel adhesion testing of Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes, Tekton Seam Tape and TRADE-SEAL on the Tekton® Building Wrap has been completed by BRANZ.
- 16.5 The following tests have been carried out on HYDRA Roof Underlay and Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6 and pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after HYDRA Roof Underlay and Wall Underlay was exposed to ultra-violet light.
- 16.6 The Flammability Index of HYDRA Roof Underlay and Wall Underlay has been evaluated in accordance with AS 1530.2.



Other Investigations

- 17.1 Durability opinions have 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 from Marshall Innovations Ltd has been examined by BRANZ and found to be satisfactory.

Quality

- 18.1 The manufacture of products covered by this Appraisal has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certifications covering quality aspects associated with these products.
- 18.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 18.3 Building designers are responsible for the design of the building, and for the incorporation of The Marshall Weatherization System into their design in accordance with the instructions of Marshall Innovations Limited.
- 18.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Sources of Information

- AC 148 [2001] Acceptance criteria for flashing materials ICBO Evaluation Service Inc. July 2001.
- AS 1530.2: 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp - cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- BS 6538-3: 1987 Method for determination of air permeance using the Garley apparatus.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



In the opinion of BRANZ, **The Marshall Weatherization System** 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 **Marshall Innovations Limited**, 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. **Marshall Innovations Limited:**
 - 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 **Marshall Innovations Limited**.
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 **Marshall Innovations Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

15 May 2020

TEKTON SPECIFICATION

PRODUCT DESCRIPTION

Tekton Wall Underlay is a synthetic breather-type Wall Underlay for use as a wall underlay and air barrier under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is a coated spun-bonded polypropylene, and is approximately 0.6mm thick. Tekton Wall Underlay is supplied in rolls 2740mm x 37m and 1370mm x 37m.

FEATURES /BENEFITS

- Tekton Wall Underlay can be used in all wind zones up to and including very high and extra high with RAB Systems.
- Tekton Wall Underlay is fire retardant with a zero flammability index and can be used without restriction on all buildings, however must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the NZ Building Code.
- Tekton Wall Underlay can be installed as an air barrier to walls that are not lined, such as gable ends.
- Tekton Wall Underlay has superior water hold out - keeping framing drier while permanent cladding is installed.
- Tekton Wall Underlay has 50 year durability.
- Tekton Wall Underlay can be left exposed for up to 60 days.
- Tekton Wall Underlay has optimal surfactant resistance (will not lose integrity if exposed to most soaps, detergents and cleaning chemicals).
- Tekton Wall Underlay is Branz appraised # 548 (2013)
- Tekton Wall Underlay can be used as a non-rigid backing material for stucco plaster and as a slip layer over rigid backing for stucco plaster.
- Tekton Wall Underlay is compatible with metal cavity battens.

APPLICATION RANGE

TIMBER FRAMED BUILDINGS

- With absorbent wall claddings directly fixed to the framing.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

STEEL FRAMED BUILDINGS

- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

Tekton Wall Underlay can also be used on buildings subject to specific weathertightness design.

STORAGE

Tekton Wall Underlay must be stored on its end in a clean and dry environment. It is the responsibility of the installer to protect the roll from damage and weather.

SURFACE PREPARATION

Studs must be provided at a maximum of 600mm centres. Nogs must be fitted flush between the studs at a maximum of 1200mm centres. The framing must be free from any sharp protrusions that may damage the wall underlay.

INSTALLATION

PLACEMENT

- The branded side of the wall underlay must face away from the framing.
- The wall underlay must run horizontally.
- The wall underlay must extend from the upper side of the top plate to the underside of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.
- Horizontal laps must be no less than 75mm with the direction of the lap ensuring that water is shed to the outside.
- End laps must be made over framing and be no less than 150mm wide.

It is preferable to tape all joins.

APPLICATION

- Position the roll of Tekton Wall Underlay against the framing with a short length of wall underlay free of the roll.
- Align the guide marks printed on the Tekton Wall Underlay with visible studs and nail /staple to the framing

Fix the wall underlay into place using 6-8mm zinc/ stainless plated staples, hot dip galvanised large head clouts or proprietary wall underlay fixings.

- Unroll the wall underlay across the framing and fix to all framing members at a maximum of 300mm centres.
- Keep the wall underlay straight and taut over the framing.
- The wall underlay should be run over any openings and these should be left covered until the windows and doors are ready to be installed. To form the openings cut the wall underlay at a 45 degree diagonal in from each corner. Fold and staple the wall underlay to the inside of the framed opening. Excess wall underlay can be trimmed.

- All openings must be detailed using a Branz appraised flexible flashing system like Super-Stick, Protecto One Piece Sill Tape or the Protecto Sill System.
- Where cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when insulation is installed.
- Tekton Wall Underlay can be added as a second layer over head flashings as per E2/AS1 or the headflashing can be sealed to the wall underlay using Protecto Head Flashing Tape.
- Any damaged areas of the wall underlay must be repaired by overlapping with new material and taping, or by taping small tears .

When fixing wall underlay in windy conditions, care must be taken due to the large sail area created by the roll widths.

WARRANTY

Tekton Wall Underlay meets the durability requirements of NZBC B2.3.1(a), 50 years and B2.3.1(b), 15 years. Tekton Wall Underlay is warranted to be free of defect in manufacture. This warranty is limited to replacement of the Tekton Wall Underlay material. Marshall Innovations NZ/AUS Ltd (the distributor) is not liable for incorrect installation or any accidental or wilful damage to the product.



PRODUCT DATA SHEET

Roof | PINK® BATTS® CEILING INSULATION

Application

Pink® Batts® ceiling insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate ceilings in new homes, be retrofitted into existing homes without insulation, or over existing insulation for better performance
- Fit easily into standard ceiling constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R7.0 to assist in keeping homes above 18°C as per the World Health Organisation's recommendation for a healthy and comfortable home
- 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
- Designed for New Zealand building conditions

pink batts®

Always.

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
- Manufactured in New Zealand and Australia, reducing shipping distances
- Recycleable 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® thermal insulation products are manufactured in the same environmentally considerate way.

Note that Pink® Batts® R3.6 and Pink® Batts® R3.2 ceiling insulation is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made product only.

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

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	

* Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum values. See table on Page 5.

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.

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, folded or compressed.

Product Specifications

ROOF - Thermal Insulation	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m²)	APPROX. COVERAGE PER BALE* (m²)	ENVIRONMENTAL CHOICE
R1.8 Pink® Batts® Classic R1.8 Ceiling	7110118	1220 x 432	95	13.7	14.4	✓
R2.2 Pink® Batts® Classic R2.2 Ceiling	7110122	1220 x 432	115	12.6	13.3	✓
R2.6 Pink® Batts® Classic R2.6 Ceiling	7110126	1220 x 432	140	10.5	11.1	✓
R3.2 Pink® Batts® Classic R3.2 Ceiling [‡]	7110132	1220 x 432	170	8.4	8.8	✓ [‡]
R3.2 Pink® Batts® Skillion Roof R3.2	7110232	1220 x 432	115 max	3.7	3.9	✓
R3.6 Pink® Batts® Classic R3.6 Ceiling [‡]	7110136	1220 x 432	180	7.4	7.7	✓ [‡]
R3.6 Pink® Batts® Skillion Roof R3.6	7110236	1220 x 432	165 max	6.3	6.6	✓
R4.0 Pink® Batts® Ultra® R4.0 Ceiling	7110140	1220 x 432	195	6.3	6.6	✓
R5.0 Pink® Batts® Ultra® R5.0 Ceiling	7110150	1220 x 432	220	4.2	4.4	✓
R6.0 Pink® Batts® Ultra® R6.0 Ceiling	7110160	1220 x 432	235	3.7	3.9	✓
R6.3 Pink® Batts® Ultra® R6.3 Ceiling	7110163	1220 x 432	250	3.2	3.3	✓
R7.0 Pink® Batts® Ultra® R7.0 Ceiling	7110170	1220 x 432	260	2.6	2.8	✓

ROOF - Thermal Retrofit Insulation

R2.9 Pink® Batts® R2.9 Retrofit Ceiling	7110129	1220 x 432	150	9.5	10.0	✓
R3.3 Pink® Batts® R3.3 Retrofit Ceiling	7110133	1220 x 432	175	8.4	8.8	✓

ROOF and WALL - Thermal Insulation

R2.4 Pink® Batts® HandyPack R2.4 [^]	7200158	7000 x 580	90	4.06	-	
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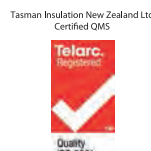
* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.

‡ This product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made product only.

For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.

^ Product does not have the Pink® Batts® Lifetime Warranty or BRANZ Appraised Accreditation.

Accreditations/Appraisals/Certifications



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9-15 Holloway Place, Penrose, Auckland,
New Zealand

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Always.



PRODUCT DATA SHEET

Wall | PINK® BATTS® WALL INSULATION

Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily into standard wall constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R4.3 to assist in keeping homes above 18°C as per the World Health Organization's recommendation for a healthy and comfortable home
- 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.

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
- Manufactured in Auckland, minimising shipping distances compared to imported products

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® Wall insulation products have Environmental Choice New Zealand Accreditation (refer to the Product Specifications)



Building Insulants
Licence No. 2504017

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® thermal insulation products are manufactured in the same environmentally considerate way.

¹ (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)

Health and Safety

Product Safety

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

- IARC (International Agency for Research on Cancer) classifies 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, 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 Organization 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 4859.1:2018	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2018-Glass wool exempt	

*Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum levels. See table on page 5.

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall 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® wall 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® wall insulation should NOT be crushed or folded

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily.

Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

Product Specifications

WALL - Thermal Insulation	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m²)	APPROX. COVERAGE PER BALE* (m²)	ENVIRONMENTAL CHOICE
Masonry						
R1.0 Pink® Batts® Masonry R1.0	7160110	1220 x 580	40	21.2	-	✓
R1.2 Pink® Batts® Masonry R1.2	7160134	1220 x 580	50	17.0	-	✓
70mm Wall Range						
R2.2 Pink® Batts® Classic R2.2 70mm Wall	7160248	1140 x 560	70	6.4	7.5	✓
90mm Wall Range						
R1.8 Pink® Batts® Classic R1.8 Wall	7127118	1140 x 560	90	16.6	19.6	✓
R2.2 Pink® Batts® Classic R2.2 Wall	7127122	1140 x 560	90	13.4	15.8	✓
R2.2 Pink® Batts® Steel R2.2 Wall	7160214	1220 x 610	90	15.6	15.6	✓
R2.2 Pink® Batts® R2.2 Narrow Wall	7160243	1140 x 360	90	9.0	11.2	✓
R2.4 Pink® Batts® Classic R2.4 Wall	7127124	1140 x 560	90	10.2	12.1	✓
R2.6 Pink® Batts® Ultra® R2.6 Wall	7127126	1140 x 560	90	9.6	11.3	✓
R2.6 Pink® Batts® Ultra® Steel R2.6 Wall	7160215	1220 x 610	90	9.7	9.7	✓
R2.6 Pink® Batts® Ultra® R2.6 Narrow Wall	7160244	1140 x 360	90	7.4	9.2	✓
R2.8 Pink® Batts® Ultra® R2.8 Wall	7127128	1140 x 560	90	6.4	7.5	✓
R2.8 Pink® Batts® Ultra® R2.8 Narrow Wall	7160247	1140 x 360	90	4.5	5.6	✓
140mm Wall Range						
R3.2 Pink® Batts® Ultra® R3.2 140mm Wall	7127132	1140 x 560	140	9.6	11.3	✓
R3.2 Pink® Batts® Ultra® R3.2 140mm Narrow Wall	7160245	1140 x 360	140	7.0	8.6	✓
R3.6 Pink® Batts® Ultra® R3.6 140mm Wall	7127136	1140 x 560	140	7.0	8.3	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Wall	7127140	1140 x 560	140	5.1	6.0	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Narrow Wall	7160246	1140 x 360	140	4.1	5.0	✓
R4.3 Pink® Batts® Ultra® R4.3 140mm Wall	7127143	1140 x 560	140	3.2	3.8	✓
R4.3 Pink® Batts® Ultra® R4.3 140mm Narrow Wall	7160262	1140 x 360	140	2.9	3.6	✓

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.
 # For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.

Accreditations/Appraisals/Certifications



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EzyBrace[®] Systems

Specification and installation manual

CBI 5113

AUGUST 2016

NATIONAL SUPPORT

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GIB® HELPLINE

0800 100 442

Based on learnings derived from the 2011 Canterbury earthquakes GIB EzyBrace® Systems have been updated to offer improved design flexibility and further simplification of the bracing design and build process.

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

- Improved user interface with simplified bracing design process.
- Increased functionality including exterior line check function, easy insert/deletion of bracing elements and built in software help function.
- Includes the new GIB® Bracing element GS2- NOM
- Allows the GIBFix® Framing System to be used in GIB EzyBrace® designs.

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners¹
- Encourages more even bracing distribution throughout the building.

¹ Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

- Large hole specification updated to use a more conservative methodology.
- Guidance included for fireplace flues and range hoods.

NEW — GIBFIX® FRAMING SYSTEM

- Reduced potential for fastener pop and joint cracking as a result of timber frame movement.
- Reduced potential for on-site call backs.
- Improved thermal performance.
- Reinforced plasterboard junctions.



BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until further notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

	Acceptable alternative GIB® plasterboards									
Specified GIB® plasterboard	GIB® Standard	GIB Ultraliner®	GIB Braceline/ Noiseline®	GIB Aqualiner®	GIB Toughliner®	GIB Fyreliner®				
						10mm	13mm	16mm	19mm	
GIB® Standard		OK	OK	OK	OK	Note 1 and 3				
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3			

- Note 1** The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.
- Note 2** The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.
- Note 3** Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.

Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

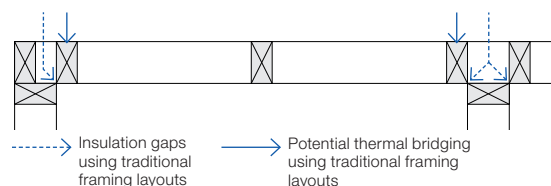
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

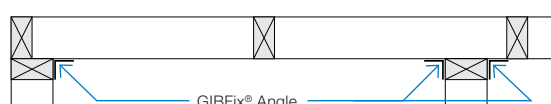
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFix® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners!
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 — DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 — ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

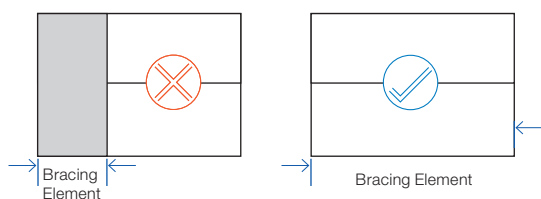
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

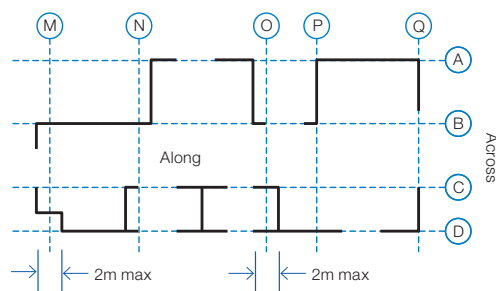
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 'rules' are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®.
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- 'N' stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15–16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)

Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 – DEMAND CALCULATION SHEET AND ‘POP UP’ HELP FACILITY

GIB EzyBrace® Bracing Software


File

Home

Job Details

Name:

A Job

Street and Number:

100 Job Street

Lot and DP Number:

Lot 321, DP 499

City/Town/District:

Jobtown

Designer:

AR Chitact

Company:

Jobs Limited

Date:

1/08/15

Building Specification

Number of Storeys:

Single

Floor Loading:

2 kPa

Foundation Type:

Shale

Single

Claadding Weight:

2 Light

Roof Weight:

2 Light

Rosen in Roof Space:

Nil

Roof Pitch:

25

Roof Height above Eaves (m):

1.5

Building Height to Apex (m):

4.5

Ground to Lower Floor (m):

0.2

Stud Height (m):

2.4

Building Length (m):

10

Building Width (m):

10

Building Area (m2):

100

Building Location

Wind Zone - Low

Wind Zone or Consent Authority:

Not Availa

Wind Region:

A

Lee Zone:

Nil

Ground Roughness:

Urban

Site Exposure:

Sheltered

Topography Class:

11

Earthquake Zone:

1

Soil Type:

D & E (Deep to Very Soft)

Annual Prob. of Exceedance:

1 in 550 (NZS3904:2011 Default)

Bracing Units required for Wind

Along

Across

Single Level

258

222

Bracing Units required for Earthquake

Along and Across:

Single

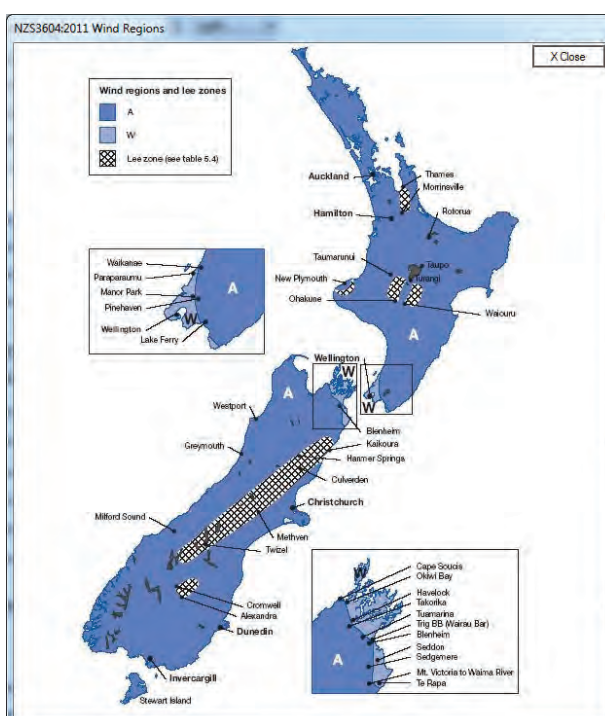
264

Demand

Single Along

Single Across

Custom



 Download GIB EzyBrace® 2016 design software
from gib.co.nz/ezybrace

Software functionality

Innovations adopted in the GIB EzyBrace® 2016 bracing 'resistance' calculation sheets include the ability to easily add and delete lines and elements during calculations.

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum

bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

Figures 6 and 7 show screen shots of the Wall and Subfloor Resistance Sheets respectively.

FIGURE 6: GIB EZYBRACE® 2016 — WALL BRACING RESISTANCE CALCULATION SHEET

Line	Ext. Len. (m)	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BU)	Earthquake (BU)	Resistance
a	11.25	1	0.5		2.44	GS1-H	GIB®	63	59	1499 220%
		2	1.1		2.44	GS1-N	GIB®	72	65	
		3	0.6		2.44	GS1-H	GIB®	67	73	
b	6.41	1	1.2		2.44	GS1-N	GIB®	81	71	193 OK
		2	0.6		2.44	GS1-N	GIB®	34	35	
		3	4		2.44	GS2-NOM	GIB®	197	197	
c		1	3.2		2.44	GS2-NOM	GIB®	157	157	312 OK
d		1	7.9		2.44	GS2-NOM	GIB®	389	389	157 OK
e	17.9	1	0.6		2.44	BL1-H	GIB®	58	60	389 OK
		2	0.6		2.44	BL1-H	GIB®	58	60	
		3	0.8		2.44	GS1-N	GIB®	48	45	
		4	2.1		2.44	GS1-N	GIB®	143	124	
		5	1.2		2.44	EP1-1.2	CHH	142	159	
									449 OK	449 OK

FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Line	Ext. Len. (m)	Element	Length (m)	Angle (degrees)	Type	Supplier	Wind (BU)	Earthquake (BU)	Resistance
A		1	1		Braced Piles	NZS3604	160	120	1100 258%
		2	1		Anchor Pile	NZS3604	160	120	
		3	1		Braced Piles	NZS3604	160	120	
B		1	1		Braced Piles	NZS3604	160	120	480 OK
		2	1		Can't lever Pile	NZS3604	70	30	
		3	1		Can't lever Pile	NZS3604	70	30	
C		1	1		Anchor Pile	NZS3604	160	120	300 OK
		2	1		Anchor Pile	NZS3604	160	120	
									320 OK

Software functionality

Custom elements can be entered by accessing the 'custom' tab as shown in figure 8.

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET

Supplier	System	Min. Length (m)	Wind Blotin	EQ Blotin	Element Height Dependant	Element Foundation Dependant	Import Proprietary Custom Elements
Custom1	CU1-0.4	0.4	80	92	☒	☒	☐
Custom1	CU1-0.5	0.5	95	105	☒	☒	☐
Custom1	CU1-1.2	1.2	120	135	☒	☒	☐
Custom2	CU2-0.4	0.4	90	98	☒	☒	☐
Custom2	CU2-0.5	0.5	127	136	☒	☒	☐
Custom2	CU2-1.2	1.2	164	135	☒	☒	☐
Engineer	Portal	1	300	300	☒	☒	☐

Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

Help can be accessed by pressing the ? symbol which displays a window with further information.

The GIB EzyBrace® 2016 software has a number of options that can be accessed via the File tab at the top left hand corner of the window. The options include: New, Save, Save As, Open, Recent and Print.

- The New option closes any opened job ready for the input of a new job.
- The Save option saves the currently opened job to the same filename and the Save As option saves the job to a new filename.

- The Open option prompts for the name of an existing job.
- The Recent option displays a list of the ten latest jobs and allows for the selection of one of these jobs to be opened.
- The Print option displays the print screen. In this screen, a print preview is displayed. The print preview can be copied to the clipboard by clicking the right-hand mouse button. Also on the print screen is the option to choose which pages are to be printed and the option to print the output to a portable data format, PDF, file.
- The Print Screen View is shown in figure 9.

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For further design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

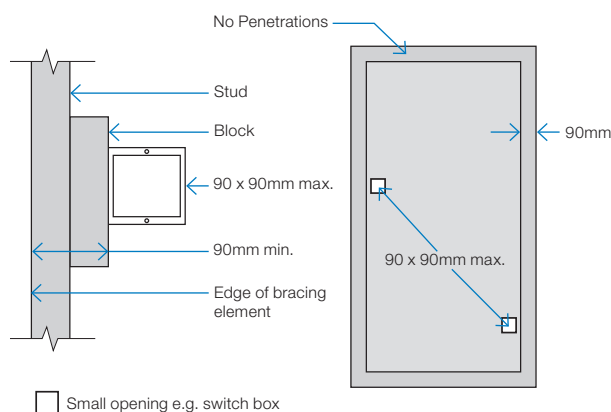
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

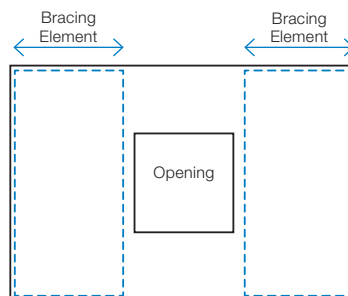
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

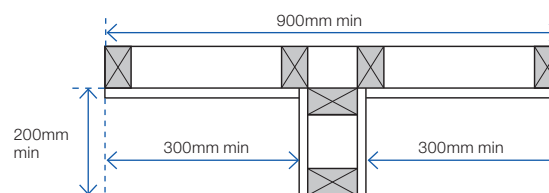
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

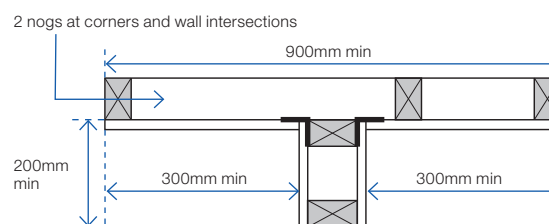
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



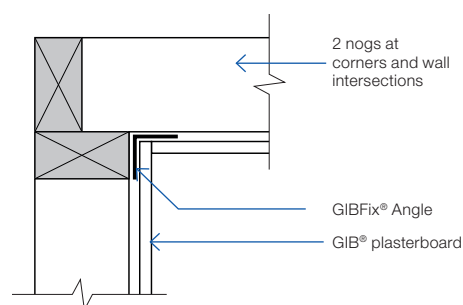
GEB002

FIGURE 13: WALL INTERSECTION (GIBFix® FRAMING SYSTEM)



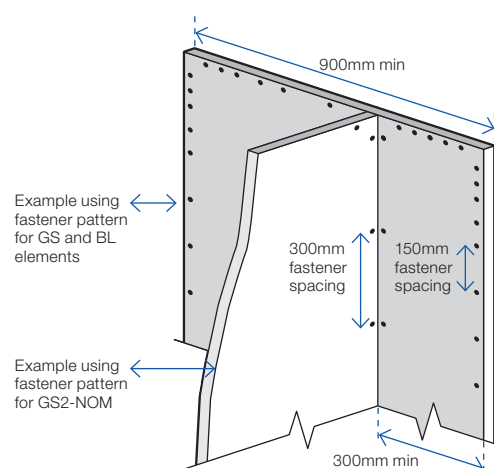
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFix® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR – EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR – INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

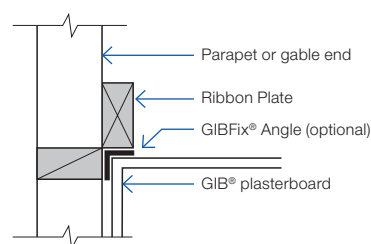
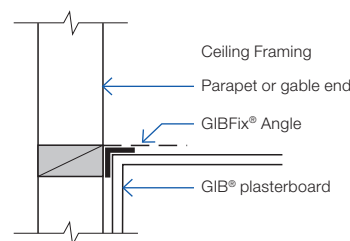


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

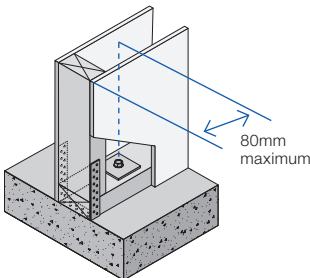
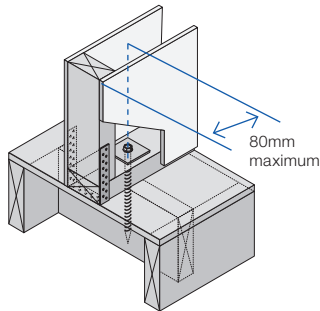
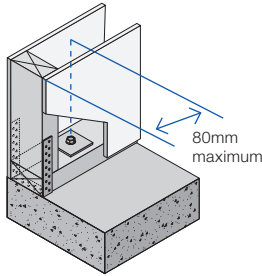
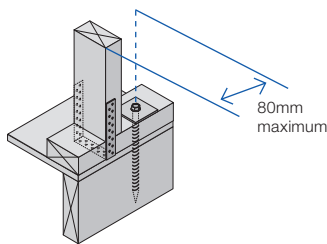
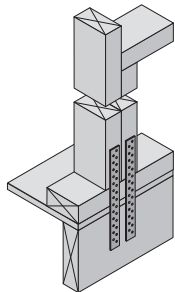
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and

positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

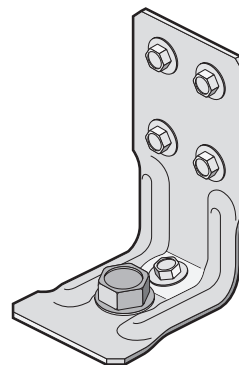
Concrete floor		Timber floor	
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.			
Internal wall			
			
GEB004		GEB005	
External wall			
			
GEB006		GEB007	
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library .		2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.	
			
		GEB008	
Hold-down fastener requirements			
Concrete floor		Timber floor	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.		12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element	

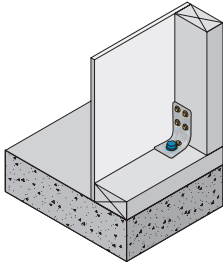
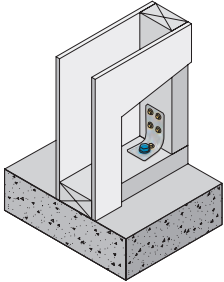
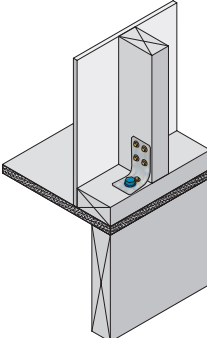
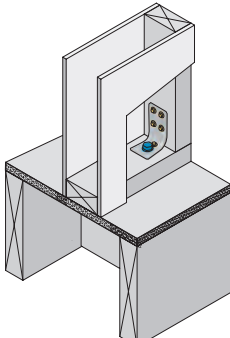
GIB HandiBrac® installation

Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested by Winstone Wallboards for use in GIB EzyBrace® elements that require hold-downs. The GIB HandiBrac® is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac® with BOWMAC® blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.



Concrete floor		Timber floor	
External walls	Internal walls	External walls	Internal walls
 GEB009 Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	 GEB010 Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	 GEB011 Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	 GEB012 Position GIB HandiBrac® in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac® pack.	

GIB HandiBrac® placement with GIBFix® Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac® panel hold-down brackets within the GIBFix® Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac® can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

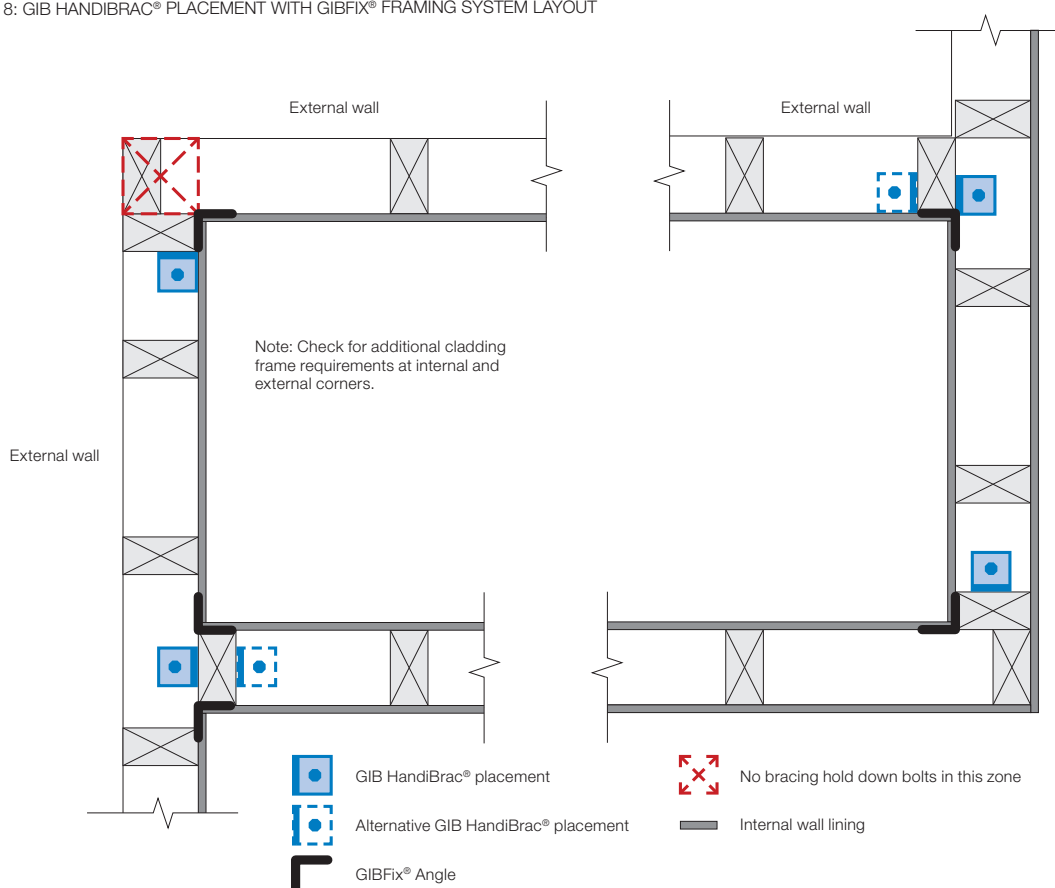
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

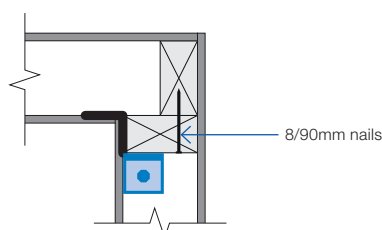
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC® PLACEMENT WITH GIBFIX® FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at:

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzvBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

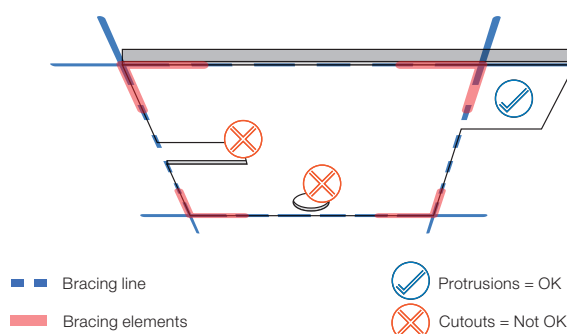


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

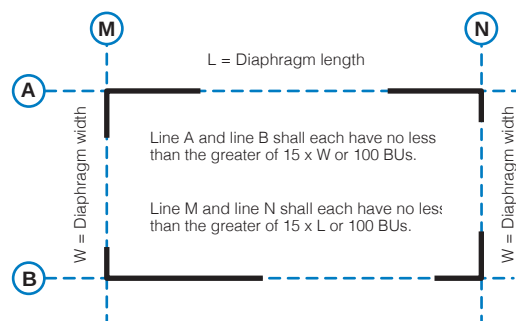


FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS

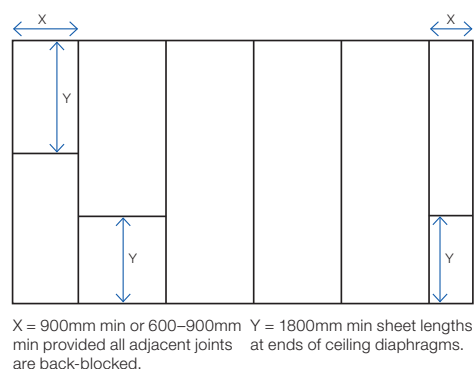
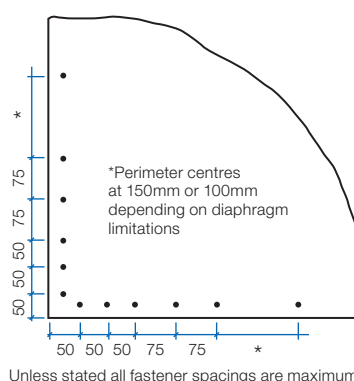


FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Ceiling battens in ceiling diaphragms

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:

- 500mm for 10mm GIB® plasterboard.
- 600mm for 13mm GIB® plasterboard.

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

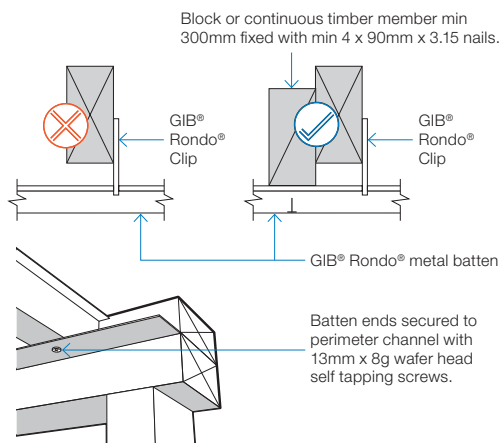
For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:

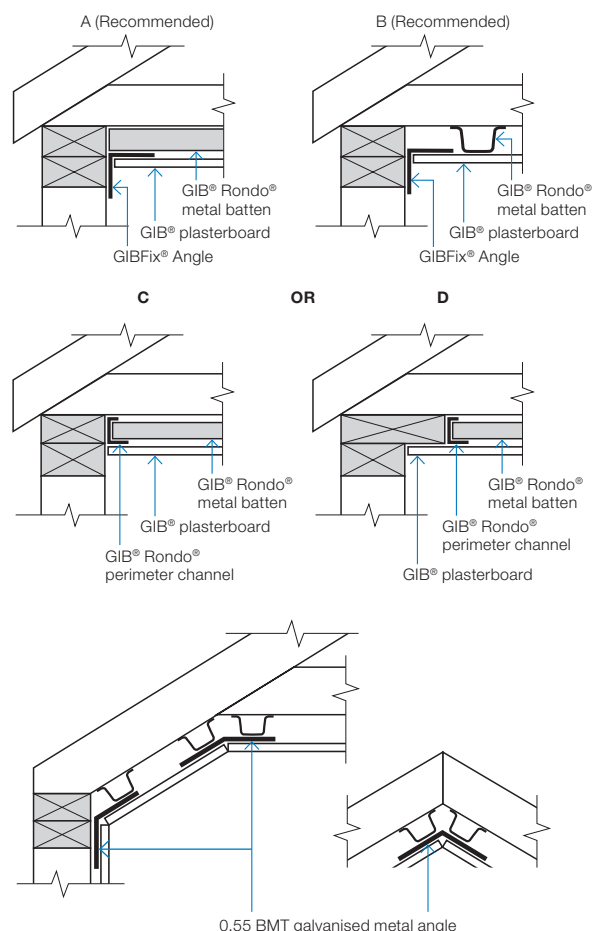
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



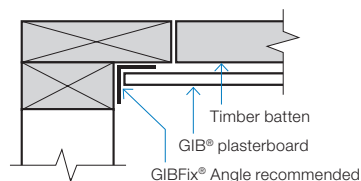
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed within the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvanised metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

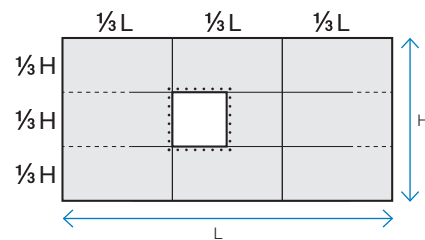
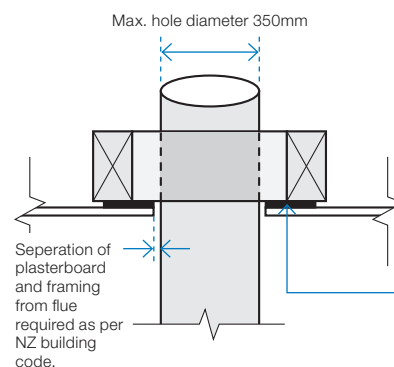
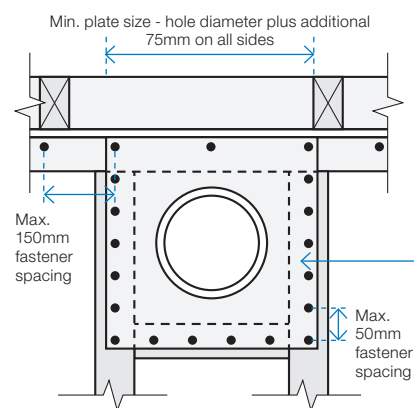


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Plasterboard ceiling not shown in plan view

Steel plate
0.55 BMT
Galvanised sheet
Max. opening
350mm diameter.
Installed prior to
GIB® plasterboard.

Framing
90 x 45mm framing
trimmed to provide
extra fixing.

GIB® plasterboard ceiling
Installed over the
steel plate and into
framing using a
minimum of 32mm
x 6g GIB® Grabber
High Thread or
32mm x 7g GIB®
Grabber Dual Thread
screws at 50mm
max centre spacing.

Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

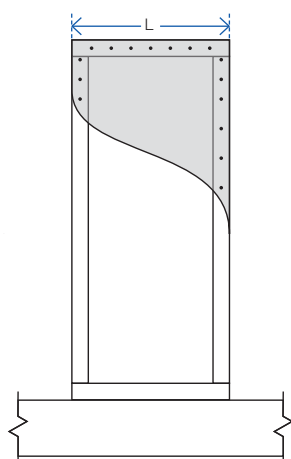
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

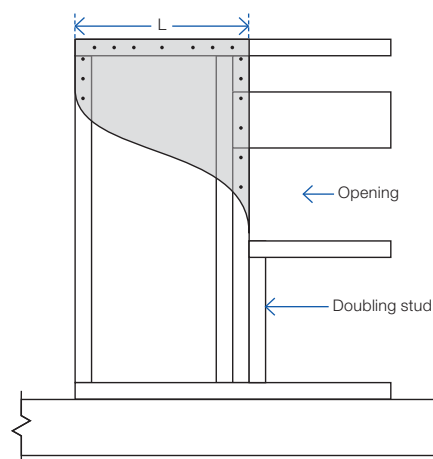
Fastener spacings and diagram scales shown in Figures 29-32 are indicative only. Refer to p.23-30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



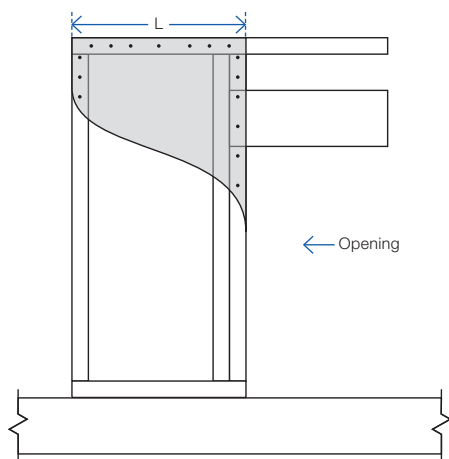
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



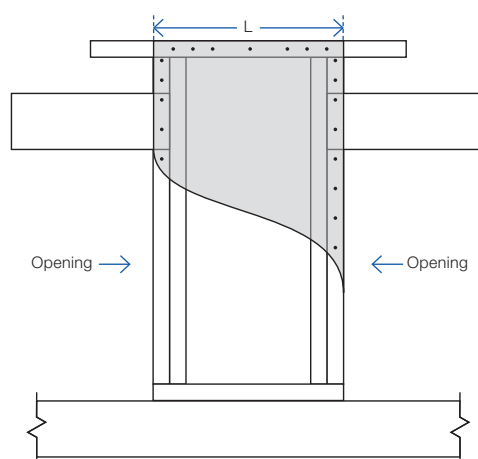
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

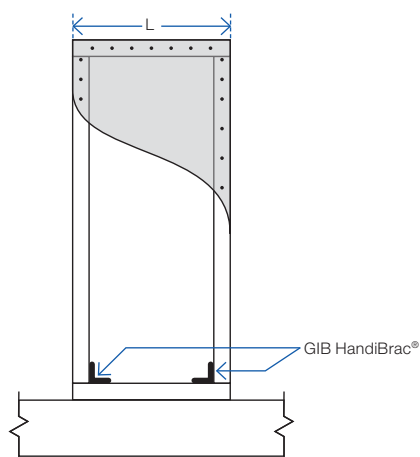
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34–36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB Handibrac® bolt.

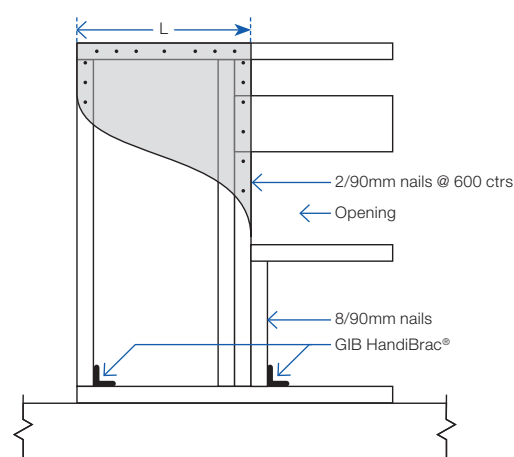
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



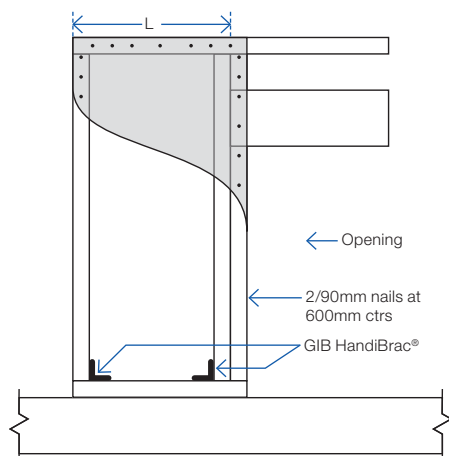
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



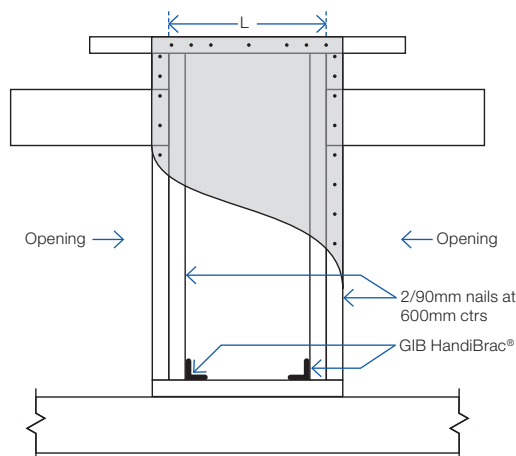
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

GIB EzyBrace® Systems specification GS1-N

Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

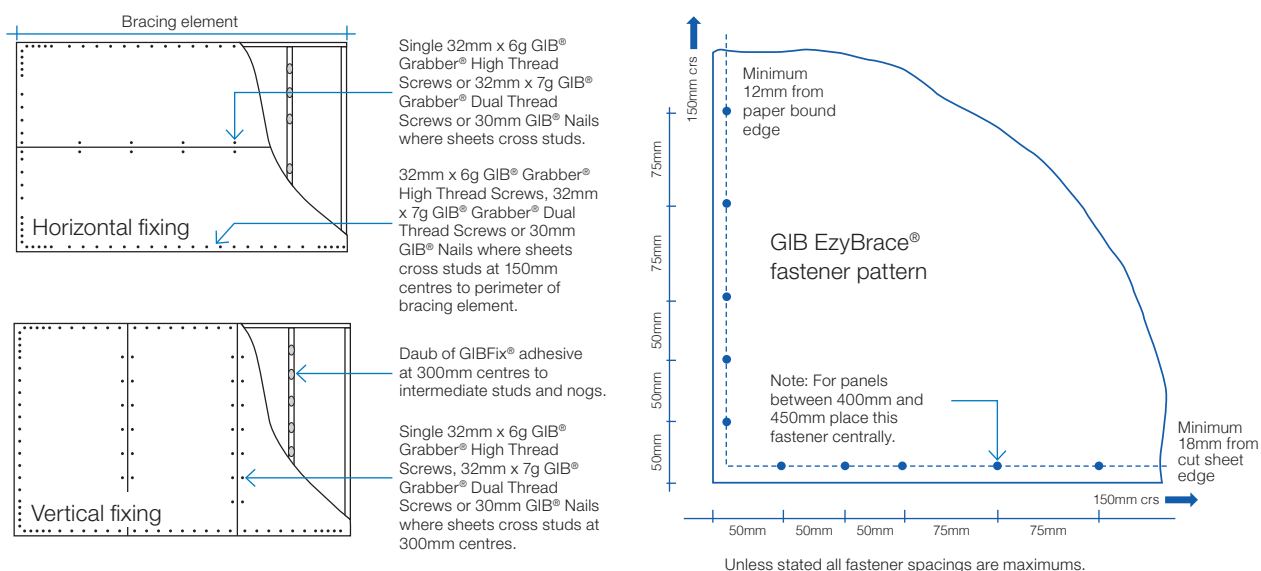
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100mm x 3.75mm nails at 600mm centres; or three power driven 90mm x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75mm x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

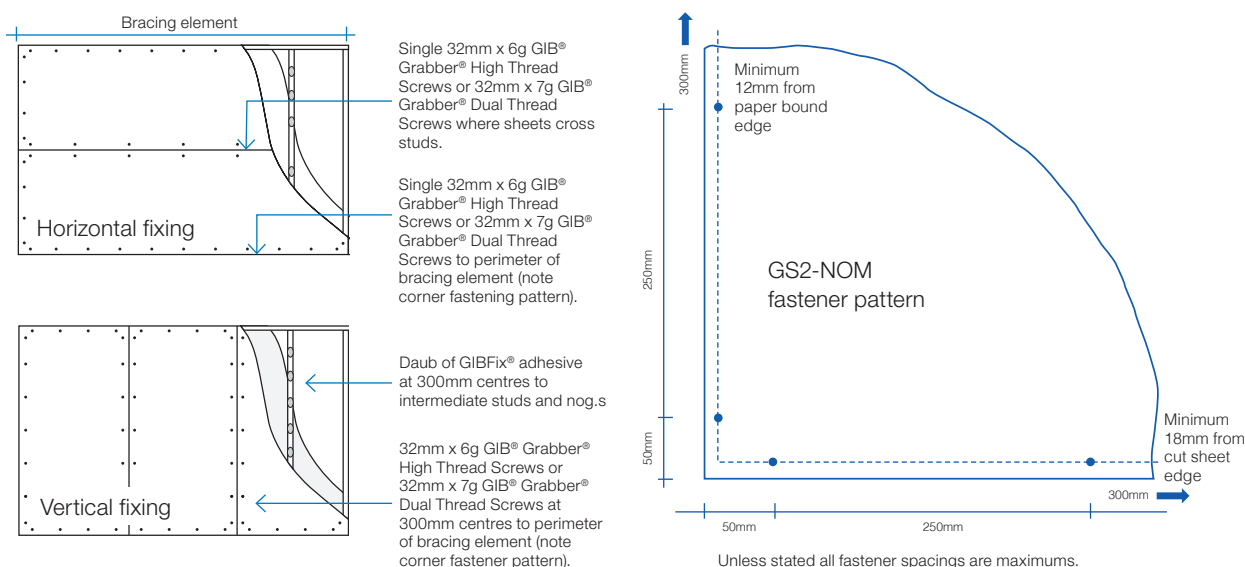
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

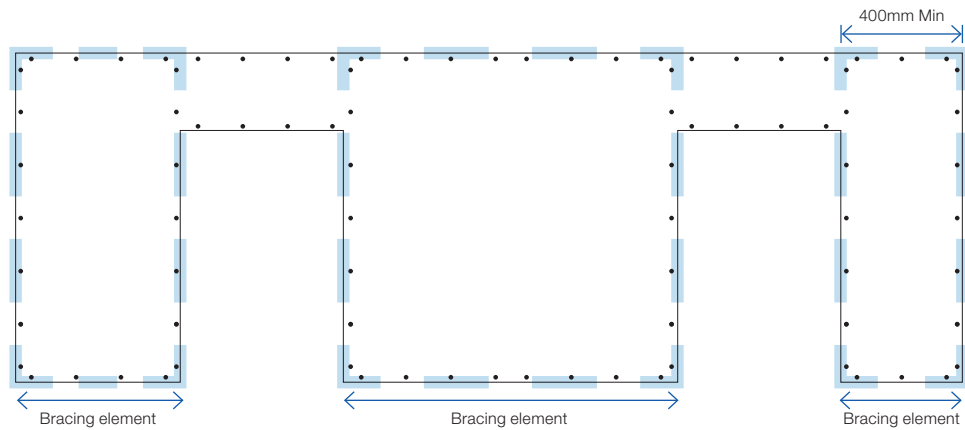
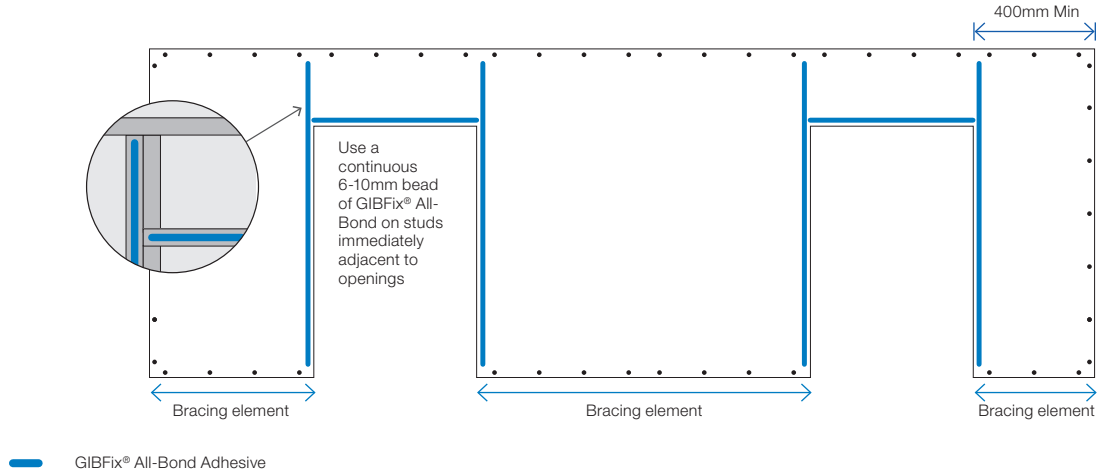
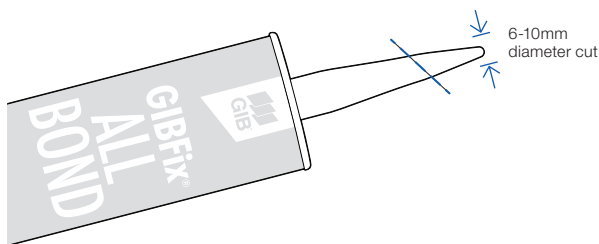


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to each side of the wall.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

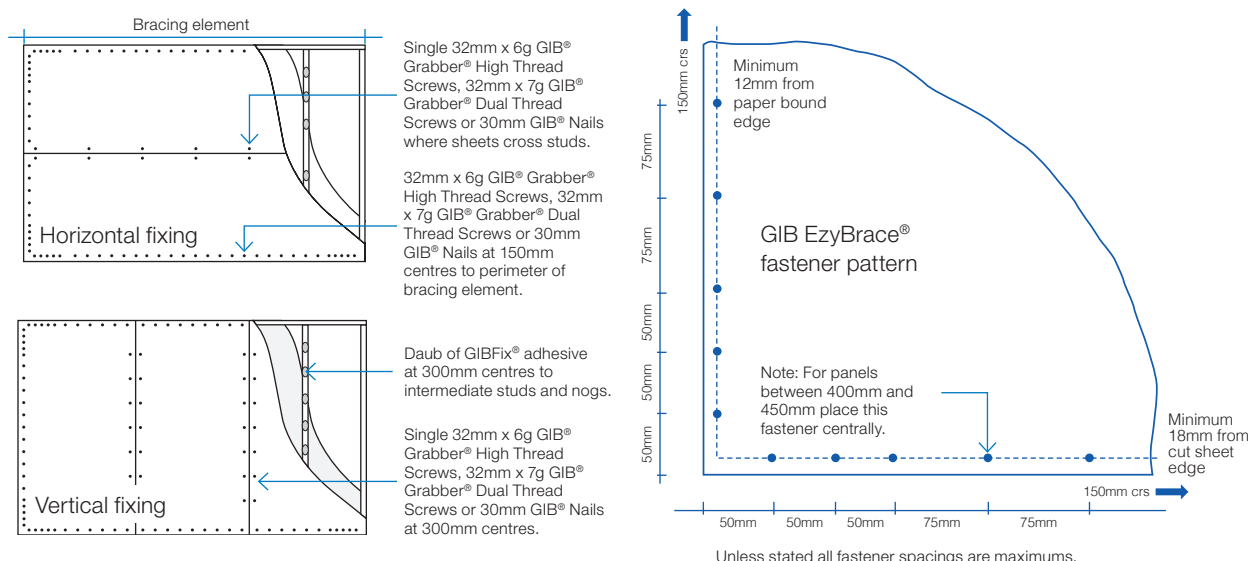
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

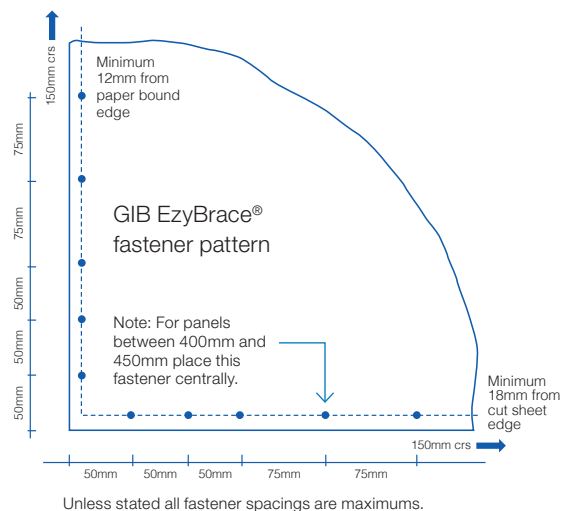
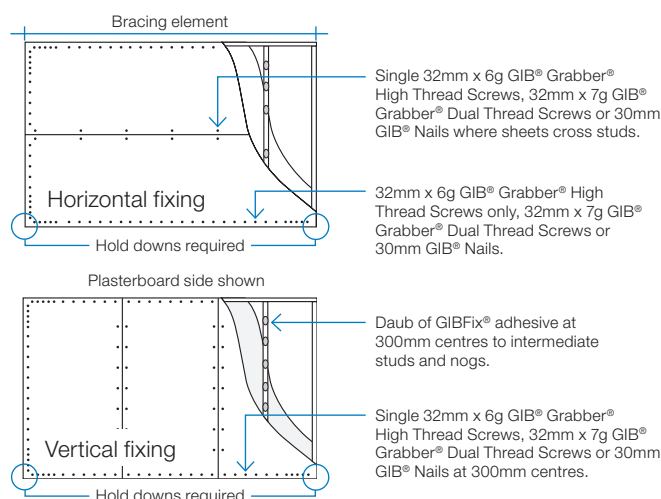
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BL1-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline®
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

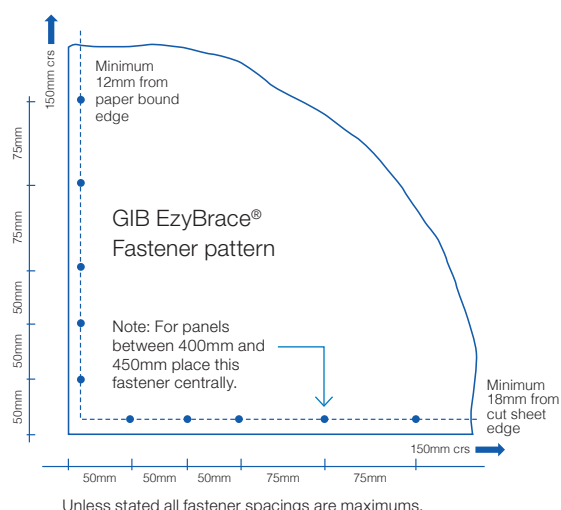
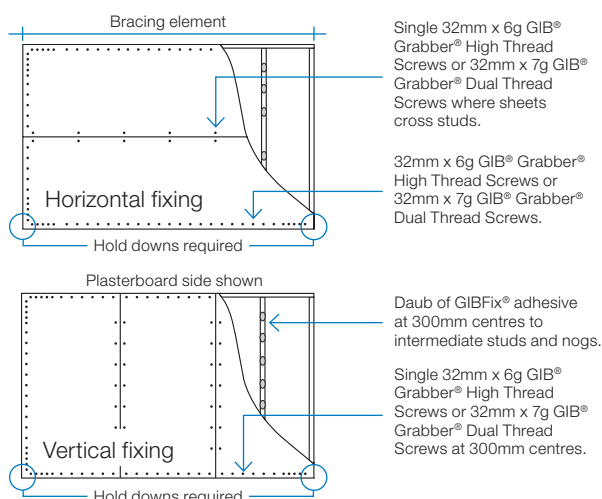
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm from maximum each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the sheet joint. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



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GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

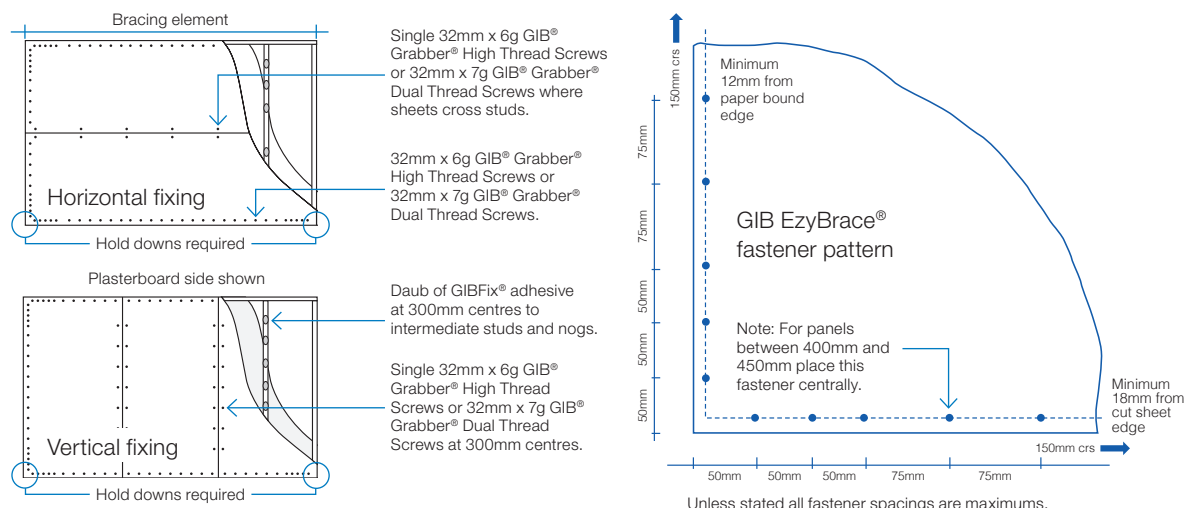
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

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GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure; B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

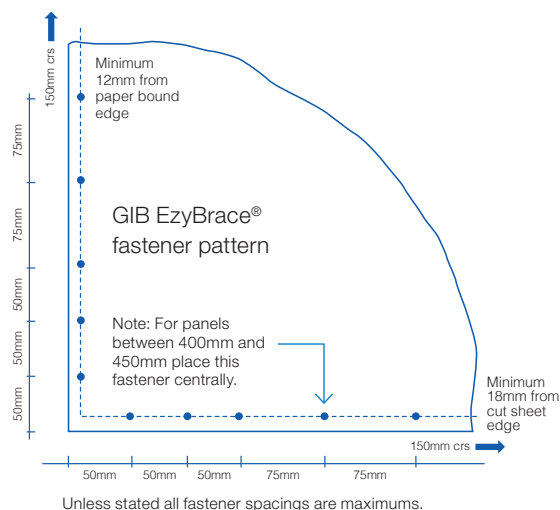
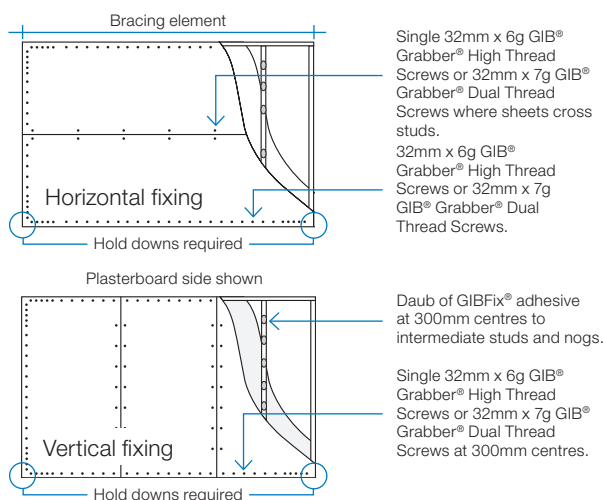
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Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems



Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERT}™

The Global GreenTag^{Cert}™ certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag^{Cert}™

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

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Winstone Wallboards asserts its moral rights and reserves all other intellectual property rights in the materials contained in this brochure and related to GIBFix® Framing System and GIB EzyBrace® Systems.

TRADEMARKS

The names GIB®, GIB Fyrelime®, GIB Ultraline®, GIB Braceline®, GIB Toughline®, GIB Noiseline®, GIB Aqualine®, GIB Nail®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, the colour mauve for GIB Toughline®, GIB HandiBrac®, GIB EzyBrace®, the colour blue for GIB Braceline®, the colour pink for GIB Fyrelime®, the colour green for GIB Aqualine®, and the shield device are registered trademarks of Fletcher Building Holdings Limited.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.

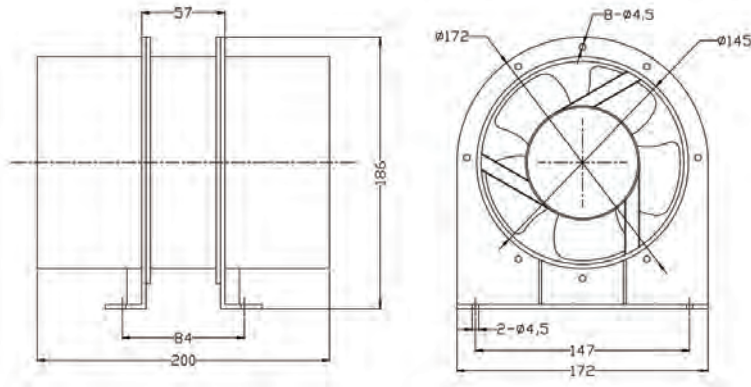


FOR MORE INFORMATION VISIT

gib.co.nz

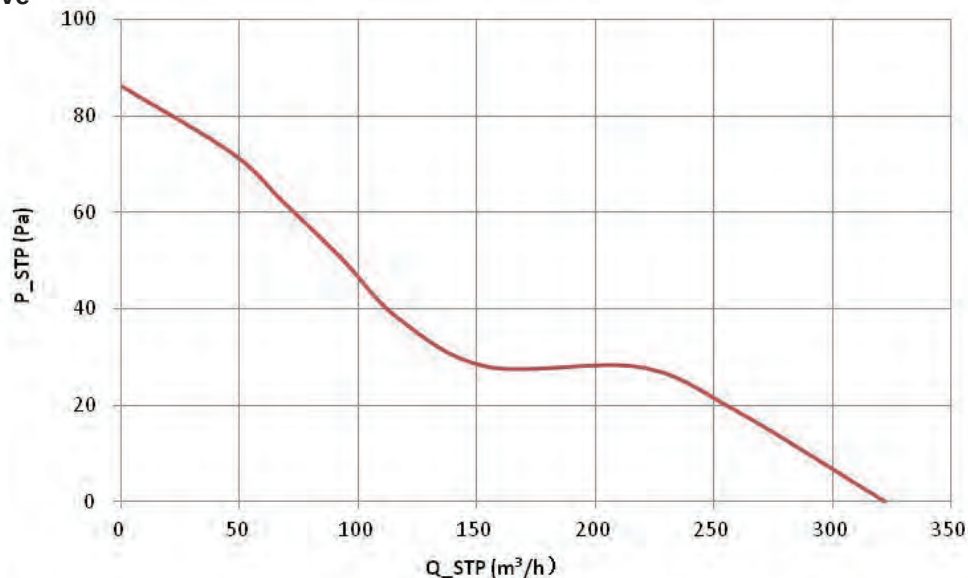
OR CALL THE GIB® HELPLINE

0800 100 442

Specification Sheet - VA150

Inline Fan Axial Fan

Designed for use in bathroom and laundry extraction and general air movement applications.

Motor Type	Shaded Pole
Net Weight	1300g
Rotation Direction	CW
Rated Voltage	220-240V 50Hz
Rated Current	0.26A
Rated Input Power	36W
Maximum Speed	2500R/min
Maximum Air Flow	323m ³ /h
Maximum Static Air Pressure	86Pa
Operating Temperature	-20 to +70°C
Environment Humidity	10%(RH)45°C for 24 hours & 98% (RH) 45°C
MTBF	30000H
Temperature Protection	Yes
Lock Rotor Protection	Manual Reset
Ingress Protection	IPX2
Climate Class	T
Soft Start	Yes
Dielectric Strength	500VAC/60Hz 1min ≥5mA
Sound Level @ 3m	45dB

Fan Pressure Curve




316581G
May 2018

INSTALLATION INSTRUCTIONS & OWNERS GUIDE

RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS

Congratulations for choosing a Rheem Water Heater

It is important that you take a few minutes
to read this booklet as it may save you
time and trouble later.

If you require any further information or your
water heater needs to be serviced, please contact the
Rheem Service Department on 0800 657 335,
or the nearest service centre
(look in the Yellow Pages under "Plumbers")
Or visit www.rheem.co.nz

Important to the Installer

Do not leave this booklet inside the element cover
after installation

Please leave the booklet with the water heater's owner

IMPORTANT INFORMATION

GENERAL

- The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.
- This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

ABOUT YOUR WATER HEATER

Q. DOES THE WATER QUALITY AFFECT THE WATER HEATER?

- A. Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please refer to page 6.**

Q. HOW HOT SHOULD THE WATER BE?

- A. All models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments. For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a stored temperature setting of not less than 60°C. A tempering valve set at a maximum of 55°C must be used on domestic wet areas.

Q. HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

- A. Refer to the installation requirements on page 4.

Q. HOW LONG WILL THE WATER HEATER LAST?

- A. There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 7).

The life of the water heater may be extended by arranging for an authorised person to inspect the anode and replace it, if required.

The suggested time after installation when the anode should be inspected is:

Vitreous Enamel 8 years

Optima 10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 6).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and, as a result, a small amount of water is discharged from the cold water expansion valve.

NON-SIMULTANEOUS ELEMENT MODELS

The two heating elements are wired for non-simultaneous operation, so that only one heating unit can operate at a time. The bottom heating unit is usually connected to an off-peak (overnight) supply and the top heating unit to a continuous supply. **The red link wire must be removed from the terminal block during installation if two separate power supplies are to be used.** Leaving the link in place ensures both elements operate correctly with a single power supply.

The basic operation is as follows: when the water temperature at the top of the water heater has reached the set temperature, the thermostat switches the top element off. This creates a circuit to the bottom heating element by switching the neutral.

SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be mounted on top of the water heater.

Also fitted to the water heater is a thermostat, which incorporates an over-temperature thermal cut-out device.

 **Warning:** The operation of the thermal cut-out indicates a possible dangerous situation. The thermostat and thermal cut-out is to only be adjusted or reset by an authorised service person.

These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

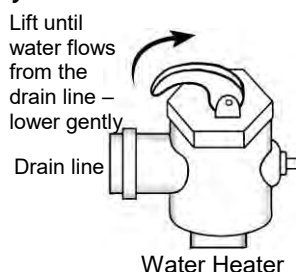
REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF (TPR) VALVE:

The easing lever (see diagram. 1) on the TPR valve should be operated regularly to remove lime deposits and verify that it is not blocked. **It is very important that you raise and lower the lever gently.**

⚠ Warning: To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater over-pressurising.

DIAGRAM 1



If water does not flow freely from the drain line or the valve fails to completely close and water continues to be discharged, contact the Rheem Service Department, phone **0800 657 335**, or the nearest Rheem Service Centre (look in the Yellow Pages under "Plumbers").

GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that 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 the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

SAVE A SERVICE CALL

CHECK THE ITEMS BELOW BEFORE MAKING A SERVICE CALL. YOU MAY BE CHARGED FOR SERVICE IF THE FAULT IS NOT RELATED TO THE WATER HEATER MANUFACTURE OR PARTS SUPPLIED WITH THE WATER HEATER BY RHEEM.

WATER DISCHARGING FROM EXPANSION CONTROL VALVES

It is normal for the cold water expansion valve and the temperature and pressure relief valve to discharge a small quantity of water during the heating cycle. If either of these valves discharge more than a bucket full of water in 24 hours, one of the following may be the cause.

- **Continuous dribble**

Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.

- **Heavy flow of hot water until the water is cold – then stops while the water reheats**

Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre or www.rheem.co.nz to arrange an inspection.

- **A steady flow of water (often at night)**

This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

- **Is the electricity turned on?**

Check the switch marked 'water heater' at the switchboard and the water heater isolating switch. Check the fuse or circuit breaker marked 'water heater'.

WHERE THE WATER HEATER IS CONNECTED TO AN OFF PEAK (NIGHT RATE) ELECTRICAL TARIFF, THE SUPPLY MAY NOT BE AVAILABLE AT CERTAIN TIMES OF THE DAY.

- **Do you have the correct size heater for your requirements?**

Refer to the sizing guide in the Rheem sales literature or the Rheem website.

- **Is one outlet (especially the shower) using more hot water than you think?**

Carefully review the family's hot water usage and if necessary, check the shower flow rate. For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute (mixed hot and cold). This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.

- **Ensure the thermostat setting is appropriate. Note, some models require an authorised person to make electrical thermostat adjustments.**

HIGH ELECTRICITY BILLS

- **Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.**

- **Is either of the expansion valves discharging too much water?**

- **Is one outlet (especially the shower) using more hot water than you think?**
- **Is there a leaking hot water pipe, dripping hot water tap, etc?**
Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply wiring to the water heater.

The water heater must be installed by a certified person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements. Note that no warranty costs will be payable where the water heater is located in a position that does not comply with the Rheem water heater installation instructions or relevant statutory requirements, where the unit is installed in a position that does not allow safe or ready access, the cost of that access shall not be payable (refer to "Rheem Warranty" on page 7).

- **WATER HEATER LOCATION**

Water heaters with a galvanised outer casing are only suitable for indoor installations, whereas water heaters with a painted casing are suitable for both indoor and outdoor installations.

Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. (Typical clearances are: TPR valve removal 135 mm, Element Cover and Element Removal 400 mm). Also, you must be able to read the information on the rating plate and if possible, leave headroom of one water heater length so the anode can be inspected or replaced.

- **CONNECTION SIZES**

- Hot and Cold water connections: RP $\frac{3}{4}$ / 20.
- Relief valve connection: RP $\frac{1}{2}$ / 15.

- **INLET/OUTLET CONNECTIONS**

A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. All connection sockets on the water heater are parallel threaded and therefore tapered brass nipples must be used to ensure watertight connections. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.

- **NON RETURN VALVE**

A non return valve must be installed on the cold water line to the water heater.

- **PIPE SIZES**

The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.

- **COLD WATER EXPANSION VALVE**

A cold water expansion valve must be fitted to the cold water line to the water heater.

- **TEMPERATURE AND PRESSURE RELIEF VALVE**

When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the off-centre socket. Do not use a wrench on the valve body – use the spanner flats provided. Drain the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, preferably over a gully trap.

In some setups or circumstances, such as if freezing could occur, an air break must be provided in the drain within 300 mm of the TPR valve, refer to the New Zealand Building Code - Clause G12 for requirements and acceptable solutions for the running of hot water drain line(s).

 **Warning:** *The drain line from the TPR valve must be in copper. A Rheem mains pressure water heater must not be installed and operated without a suitable (valve that complies with AS 1357.1) temperature and pressure relief valve. Under no circumstances block the outlet of this valve or its drain pipe.*

- **WATER SUPPLY PRESSURE**

Maximum permitted mains water pressure - refer product label and Table 5.2 AS/NZS 3500.4. Note inlet pressure control valve is required where maximum permitted mains pressure is likely to be exceeded.
Minimum inlet pressure: 60 kPa

- **PRESSURE LIMITING/REDUCING VALVE**

If the water supply pressure exceeds the requirements of Table 5.2 AS/NZS 3500.4, a pressure limiting valve with a maximum setting of 500 kPa is to be fitted in the installation.

- **SAFE TRAY AND SEISMIC RESTRAINTS**

The water heater must be installed with a properly drained safe tray where there is the possibility of water damage to furniture, carpets or building. All water heaters must be restrained to protect against seismic forces. (Refer to the Zealand Building Code for acceptable solutions.)

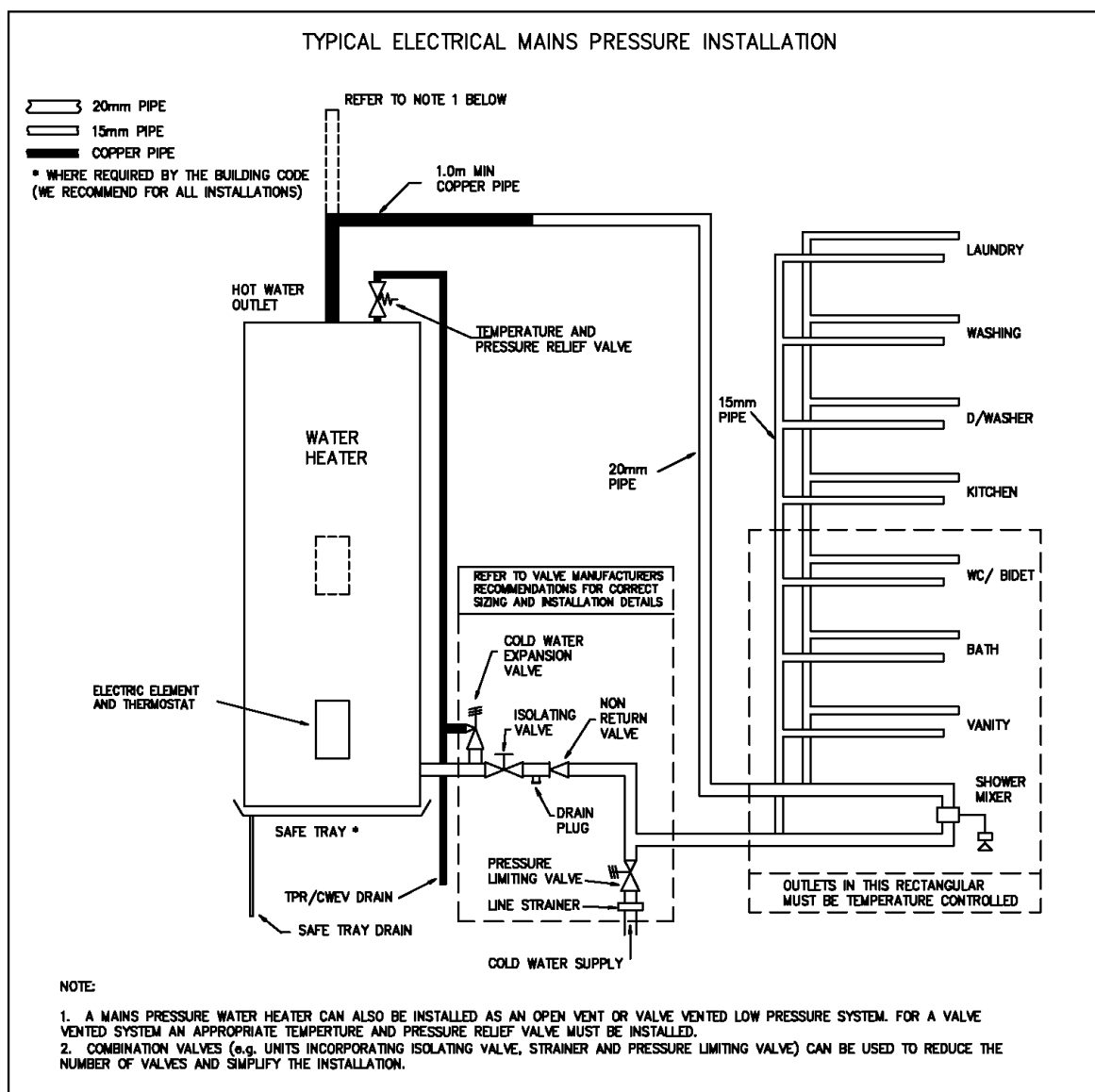


DIAGRAM 2:

CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

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 plain to screw adaptor. 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. For details, refer to the wiring diagram on the inside of the element cover. **A separate heating element earth wire is not required because the element earths by the thread of the element boss or the flange being in contact with the element socket.**

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

Warning: The power supply to the water heater must not be switched on until the water heater is filled with water and an "earth continuity test", as outlined in Annex A of AS/NZS 60335.1 has been carried out. Failure to do so will damage the element and shorten its life and may create a dangerous situation.

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

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 isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
 - Close the cold water isolation valve.
 - Operate the relief valve easing lever to release the pressure in the water heater.
 - Drain the water heater through the drain valve or plug.
 - Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain
-

WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

WATER SUPPLY CHEMISTRY

Water quality can have a detrimental effect on water heater operation, components and life expectancy and may affect the warranty.

 **Warning:** *This water heater must be installed in accordance with advice given to be covered by the Rheem warranty.*

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. This water heater must only be connected to a water supply which complies with these specifications for the Rheem warranty to apply. If you are unsure of your water chemistry you may be able to obtain information from your local water supply authority or you can contact Rheem and we will provide you with contact details of a suitable agency capable of testing your water for compliance with Rheem standards. Water quality tests must be carried out at the owner's cost.

HARSH WATER AREAS

Rheem water heaters are designed for use in areas where the Total Dissolved Solids (TDS) content of the water supply is less than 2500 mg/L.

In areas where the TDS exceeds 600 mg/L it is possible the standard magnesium anode fitted to the water heater, may be excessively active. To alleviate this, the magnesium anode should be replaced with an aluminium anode. Where the TDS of the water is less than 40 mg/L, such as when the water has been deionised or is from an alpine supply, a high potential anode should be used. The changing of anodes must be carried out by a plumber or qualified service person.

CAUTION

If your water supply has a TDS greater than 600 mg/L and the anode has not been changed, there is a possibility of hydrogen gas accumulating 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 (e.g. 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 flames near the tap whilst it is turned on. Any hydrogen gas will be dissipated as indicated by an unusual spurting of the water from the tap. Once the water runs freely again any hydrogen in the system will have been released.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating unit should be used (contact your local Rheem Service Department or an authorised service person).

Scaling water is water that containing levels of calcium carbonate (total hardness in excess of 200 mg/litre at any time when the water heater is operating) Scaling water can block and prevent the pressure & temperature relief valve from operating, resulting in damage to the water heater storage cylinder and water components. A cold water expansion control valve must be fitted where in all areas with scaling water to assist in preventing blockage of the pressure and temperature relief valve.

 **Warning:** *Failure to install an expansion control valve where scaling water conditions occur may result in the water storage cylinder failing or under certain circumstances over pressurising.*

To avoid damage to the storage cylinder and components Rheem strongly recommends scaling water be treated before entering the water heater by fitting appropriate water filters, conditioners, etc – refer to your local water authority for information on water in your area. A build up of white sediment on the hot taps or shower rose can be indicative of scaling water. Contact Rheem if this condition is observed.

 **Warning:** *Damage caused by scaling water can affect the Rheem warranty.*

The Rheem warranty of this water heater will not cover resultant faults on components, including storage tank, due to the effects of sludge and/or sediment as a result of connection to a water supply from silted or untreated sources, i.e. springs, dams, bores, rivers or town supplied from a bore.

WATER HEATERS NOT INSTALLED IN ACCORDANCE WITH THE ABOVE ADVICE WILL NOT BE COVERED BY THE RHEEM WARRANTY.

RHEEM WARRANTY

Mains Pressure Electric Water Heater Product Warranty New Zealand Only

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.
- 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 your Rheem Service Centre in New Zealand on 0800 657 335.
- 1.4 The terms of this warranty are set out in section 2 and apply to units manufactured after 1st July 2016.
- 1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to units manufactured after the date specified in the subsequent version.

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

- 2.1 The decision of whether to repair or replace a faulty component is at Rheem New Zealand Limited's sole discretion.
- 2.2 Where a failed component or unit is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem warranty.
- 2.3 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.
- 2.4 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.
- 2.5 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.
- 2.6 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.
- 2.7 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.
- 2.8 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.
- 2.9 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 1933 (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 UNITS DETAILED IN THIS DOCUMENT

3.1 The following Warranty terms apply for all Rheem Water Heaters manufactured after 1st June 2018. Rheem will repair or replace a faulty component of your unit if it fails to operate in accordance with its specifications as follows:

Warranty Cover	The period from date of installation, in which the fault must appear, in order to be covered		*Domestic use is defined as; when the appliance is installed in a single family domestic dwelling.
What components are covered	Domestic use*	Non-domestic use*	What coverage you receive

Low & Mains Pressure

Years

**(Excludes Optima)

All components	1	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only - Vitreous Enamel (Thermostat setting must be below 70°C)	10	3	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

Optima

Years

All components	3	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	12	5	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

4.1 To be entitled to make a claim under this warranty you need to:

- Be the owner of the unit or have consent of the owner to act on their behalf.
- Contact Rheem New Zealand Limited Service Department without undue delay after detection of the defect and, in any event, within the applicable warranty period.
- 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:

- Does not have its original serial numbers or rating labels.
- 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:

- Contact Rheem New Zealand on 0800 657 335 and provide 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).
- A Rheem service centre will arrange for the unit to be tested and assessed on-site.
- 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.

RHEEM SERVICE DEPARTMENT
475 Rosebank Road, Avondale, Auckland

www.rheem.co.nz

FOR SERVICE TELEPHONE
Phone: 0800 657 335

Fax: 09 829 0222

or refer to your local Yellow Pages under "Plumbers"
for your nearest Rheem Service Centre



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

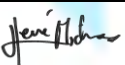


KEY INFORMATION

CERTIFICATE: GM-CM30018 RevM

1	SUMMARY OF DESCRIPTION OF BUILDING METHOD OR PRODUCT										
Linea™ Weatherboard is a 16 mm thick bevelback fibre cement weatherboard, which is designed to be used as part of an external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used. Linea™ Weatherboard Direct Fixed Cladding system consists of Linea™ Weatherboards applied direct to the external wall framing over a flexible underlay. Linea™ Weatherboard Cavity Cladding system consists of Linea™ Weatherboards fixed over timber battens to form the cavity. Both cladding methods (referenced as the system) incorporate secondary protection behind all internal and external corners, flashings for window, door and meter box penetrations as well as air seals to all wall penetrations.											
2	SUMMARY OF INTENDED USE OF BUILDING METHOD OR PRODUCT										
The system is designed to be used as part of an external cladding system on timber framed building.											
3	BUILDING CODE PROVISIONS										
The systems if designed, used, installed and maintained in accordance with this certificate will meet the following provisions of the NZBC: <table><tr><td>Clause B1 STRUCTURE:</td><td>Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).</td></tr><tr><td>Clause B2 DURABILITY:</td><td>Performance B2.3.1(b) 15 years and B2.3.2.</td></tr><tr><td>Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:</td><td>Performance C3.5, C3.7</td></tr><tr><td>Clause E2 EXTERNAL MOISTURE:</td><td>Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7</td></tr><tr><td>Clause F2 HAZARDOUS BUILDING MATERIALS:</td><td>Performance F2.3.1.</td></tr></table>		Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).	Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2.	Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:	Performance C3.5, C3.7	Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7	Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1.
Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).										
Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2.										
Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:	Performance C3.5, C3.7										
Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7										
Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1.										

4	CERTIFICATE HOLDER DETAILS
James Hardie New Zealand Limited Trading as James Hardie 1 O'Rorke Road, Penrose, Auckland 1061, New Zealand, TechnicalTeam@jameshardie.co.nz Tel: 0800 808 868, www.jameshardie.co.nz	

ISSUED	LAST UPDATE	RECERTIFICATION
26/05/2020	21/09/2022	03/07/2025
5 SIGNATURE		
		
Herve Michoux, Global Mark Managing Director		

6	PRODUCT CERTIFICATION BODY
Global-Mark Pty Ltd 57 Willis Street, Wellington, 6011 customer.service@global-mark.co.nz +64 9 889 0622 www.global-mark.co.nz	
The complaints process for this certificate can be found here: https://www.global-mark.com.au/?s=complaint	



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.

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CERTIFICATE V1.5

PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

7 CONDITIONS AND LIMITATIONS OF USE

1. The systems (respectively) are certified:
 - a. as a direct fixed external wall cladding for buildings:
 - i. within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 1.1, and
 - ii. with a risk score of 0-12, calculated in accordance with the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 2, and
 - iii. situated in NZS 3604:2011 Wind Zones up to, and including Very High, and
 - b. as a cavity fixed external wall cladding for buildings:
 - i. within the scope limitations of the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 1.1,
 - ii. with a risk score of up to 20, calculated in accordance with the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 2,
 - iii. situated in in NZS 3604:2011 Wind Zones up to, and including Extra High, and
 - c. as a cavity fixed external wall cladding for buildings specifically engineering designed (SED):
 - i. up to 25m in height, and
 - ii. with an inter-storey drift of span/180 maximum, and
 - iii. the design ultimate limit state (ULS) differential wind pressure does not exceed 3.2 kPa, and
 - iv. with the stud spacing no more than 600mm centres
 - d. located:
 - i. in all exposure zones (except microclimates) as defined in NZS 3604:2011 section 4.2, and
 - ii. located anywhere in relation to the relevant boundary for building within the scope of:
 - C/AS1, amendment 5, 5 November 2020 or
 - C/AS2, amendment 2, 5 November 2020
2. The system shall be specified, installed, inspected and maintained in accordance with the following sets of documents collectively referenced as the Applicable Technical Specification to the extent that their scope covers that for this Certificate:
 - a. For direct fixed external wall cladding application
 - i. James Hardie Linea™ Weatherboard Direct Fix Technical Specification (May 2020)
 - ii. James Hardie Fire & Acoustic Design Manual (November 2020) section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGL30 and JHETGL60. These details have only been assessed and certified with respect to external fire spread via Linea™ Weatherboard. For walls located within 1.0m of a relevant boundary, Linea™ Weatherboard may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate
 - iii. BRANZ Appraisal No 446 (2020) Linea™ Weatherboard Direct Fixed Cladding

PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

b. For cavity fixed external wall cladding applications:

- i. James Hardie Linea™ Weatherboard Cavity Fix Technical Specification (May 2020)
- ii. James Hardie Fire & Acoustic Design Manual (November 2020) section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGL30 and JHETGL60. These details have only been assessed and certified with respect to external fire spread via Linea™ Weatherboard. For walls located within 1.0m of a relevant boundary, Linea™ Weatherboard may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate
- iii. BRANZ Appraisal No 447 (2020) Linea™ Weatherboard Cavity Cladding

(Note: Provisions within the documents above related to the use of the systems with steel-frame construction are outside the scope of this certification).

3. In wind zones greater than Very High a rigid air barrier which complies with Table 23 of E2/AS1 shall be used. In Buildings exceeding 10 m in height RAB™ Board must be used including horizontal control joints in accordance with the requirements of the CodeMark certificate for RAB™ Board. (Refer to GM-CM30130)
4. The system is certified for use:
 - a. with the ancillary components as described in this certificate,
 - b. with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. Only joinery compliant with the requirements of NZS 4211:2008 including amendment 1 for the relevant Wind Zone or wind pressure shall be used or have a current CodeMark
5. The weatherboards must only be installed horizontally on vertical surfaces. .
6. All exposed faces, including top edges at sills and all bottom edges of Linea™ Weatherboard and fibre cement ancillary components must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730
7. E2.3.5 and E2.3.6 compliance is limited to cavities created between the internal surface of the panels and the underlay or RAB™ Boards.

8 HEALTH AND SAFETY INFORMATION

Standard industry safety practices and manufacturer safety requirement as detailed in the technical literature including the applicable SDS must be observed at all time. Please refer to James Hardie SDS Fibre Cement Products June 2020

9 SUPPORTING INFORMATION ABOUT DESCRIPTION

Linea™ Weatherboard cladding is finished with a latex paint system

Linea™ Weatherboards are bevel-back profile weatherboards with tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and edges. Linea™ Weatherboards are 16 mm thick and are available 150mm and 180 mm wide. The boards are supplied 4200 mm long.

Linea™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a reuel profile is machined on the back face of the weatherboard, the bottom of the board is chamfered and the tongue and groove are machined on the ends. Linea™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

James Hardie supplies the following ancillary components:

PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

- Hardie™ Axent™ Trim - a 19mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Hardie™ Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 70 mm and 89mm wide by 3000 mm long.
- External and internal corner mouldings - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2,700 mm and 4,000 mm lengths.
- Corner soakers - 90° soakers are available for 150 mm and 180 mm Linea™ Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- Cavity vent strip - uPVC, available in 3,000 mm lengths.
- Rigid wall underlay – HomeRAB™ Pre-Cladding, RAB™ Board or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.

Other components not supplied by James Hardie must meet the following requirements

- Flexible wall underlay – building paper complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 23, or breather-type membranes covered by a valid CodeMark certificate for use as wall underlays.
- Flexible building underlay support – polypropylene strap at 300 mm centres fixed horizontally and drawn taut, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. (Note: Mesh and wire galvanising must comply with AS/NZS 4534. Additional vertical battens may also be installed to provide support.)
- Flexible sill, head and jamb flashing tape - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- Cavity battens - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- Cavity batten fixings - 40 x 2.8 mm flathead hot-dip galvanised nails.
- Joinery sill and head flashings - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 20 for durability requirements.
- Planted sill and scribes - timber treated to Hazard Class H3.1, pre-primed before installation.
- Window and door trim cavity air seal - air seals complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 9.1.6, or self-expanding, moisture-cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- Flexible sealant - sealant complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- Linea™ Weatherboard fixings
 - Direct fix cladding method:- 40 x 2.8 mm flathead hot-dip galvanised Hardie™ Flex nails or stainless steel ring shank Hardie™ Flex nails (for concealed nailing), and 60 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing).
 - Cavity cladding method - 60 x 3.15 mm flathead hot-dip galvanised Hardie™ Flex nails or stainless steel ring shank Hardie™ Flex nails (for concealed nailing in NZS 3604 Wind Zones up to, and including, Very High), 75 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 Wind Zones up to, and including, Very

PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

High), and 90 x 3.55 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 3.2 kPa).

- Hardie™ Axent™ Trim fixings - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolthead nails and stainless steel ring shank jolthead nails.
(Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680).
- Flashings - balustrade and parapet cap flashings and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 20 for durability requirements.
- Aluminium joinery head flashing - as supplied by the joinery manufacturer or the contractor

10 SUPPORTING INFORMATION ABOUT INTENDED USE

Nil

11 SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE

Linea™ Weatherboard Cavity Cladding can be used to provide fire resistance rated construction, but this aspect has not been assessed and is outside the scope of this certificate.

12 BASIS FOR CERTIFICATION

The certification decision is based on independent technical review(s) of test report(s), engineering opinion(s) and other documented evidence(s), factory audit(s) and site review(s)

Code Clause	Compliance pathway	Evidence
B1 STRUCTURE	Alternative solution -Expert judgement	001, 002, 003, 021 and 022
B2 DURABILITY	Alternative solution -Expert judgement	001, 002, 003, 021 and 022
C3 FIRE AFFECTING AREAS BEYOND THE SOURCE	Alternative solution -Expert judgement	001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 021, 022 and 023
E2 EXTERNAL MOISTURE	Alternative solution -Expert judgement	001, 002, 003, 013, 014, 015, 016, 017, 018, 019, 020, 021 and 022
F2 HAZARDOUS BUILDING MATERIALS	Alternative solution -Expert judgement	001, 002, 003, 021, 022 and 024

13 SUPPORTING DOCUMENTATION FOR CERTIFICATION

Ref	Author	Title	Date and/or revision
001	BRANZ	LINEA™ - WEATHERBOARD CAVITY CLADDING - Appraisal No. 447 [2020]	02 September 2020
002	BRANZ	LINEA™ - WEATHERBOARD DIRECT FIXED CLADDING - Appraisal No. 446 [2020]	02 September 2020
003*	BRANZ	BRANZ Appraisals Means of Compliance - Basis of Appraisal - LINEA™ WEATHERBOARD DIRECT FIXED AND CAVITY CLADDING - Appraisal No 446 and 447 (2020)	TV10686-001 21/08/2020
004*	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH3182 21 November 2002



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005*	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH 2976 15 May 2001
006*	BRANZ	Fire Assessment Report based Cone calorimeter test (BRANZ Project No. FC10254-001).	FSR 4206 Issue2 7 November 2018
007*	BRANZ	Fire technical Opinion: Technical opinion based on NFPA 285 Compliance with NZBC C/AS2, clause 5.8.2 (b) and C/VM2 Part A (a).	FC12172-001 1 November 2019
008*	BRANZ	Fire Assessment Report Review of James Hardie Fire and Acoustic Manual	FAR 4620 – 04 November 2016
009*	BRANZ	Fire technical Opinion: Fire resistance of James Hardie Wall Systems with Service Penetrations	FC12040-004 -03 december2019
010*	BRANZ	Technical Assessment “Fire Resistance of External Wall and Soffit” _Various JH Products	FAR 2597- 5th October 2005
011*	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6706.01-121-24 - 20th August 2019
012*	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6707.01-121-24 - 21st August 2019
013*	Clarkson Consulting Services	JH NZ_RAB_Weathertightness Assessment_200626_R1.5	26 June 2020
014*	James Hardie Building Product	Weathertightness Testing of Residential Façade Fibre Cement Cladding System On Cavity Battens to the requirement of Verification Method E2/VM1	TS061-05, dated 15 February 2006
015*	James Hardie Building Product	TESTING OF A TITAN RESIDENTIAL FIBRE CEMENT CLAD FAÇADE FOR COMPLIANCE WITH THE REQUIREMENTS OF AS/NZS 4284:1985 “TESTING OF BUILDING FACADES”	TS010-06, dated 14 November 2006
016*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS003-13, dated 4 December 2013
017*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS022-13, dated 12 November 2013
018*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS033-13, dated 8 January 2014
019*	James Hardie Technical Support group	Weathertightness & Façade System (E2/VM1)	TS009-15, dated 14 October 2015
020*	James Hardie Technical Support group	Testing of James Hardie NZ ExoTec Façade panel top hat rainscreen façade system in accordance with AS/NZS 4284:2008	FT-R1005, dated May 2017
021	James Hardie New Zealand Limited	James Hardie Linea™ Weatherboard Direct Fix Technical Specification (May 2020)	May 2020
022	James Hardie New Zealand Limited	James Hardie Linea™ Weatherboard Cavity Fix Technical Specification (May 2020)	May 2020
023	James Hardie New Zealand Limited	James Hardie Fire & Acoustic Design Manual. Section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGL30, JHETGL60 and JHETLL60	November 2020



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.

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>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.



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Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems



024	James Hardie New Zealand Limited	LQA8N - SAFETY DATA SHEET- JAMES HARDIE FIBRE CEMENT SHEETS PRODUCTS	Version No.: 1.0 ISSUED Date : 18/06/2020
* These documents were provided commercial in confidence and are not publicly available			
14 CONDITIONS RELATING TO NOTIFICATION			
(a) the certificate holder notifies the product certification body in writing of any intended change to any of the following particulars: (i) the name, address, or contact details of the certificate holder: (ii) any address of a location where a certified product is produced or manufactured: (b) the certificate holder notifies the product certification body in writing of any intended change, modification, or alteration to any of the following: (i) the certified building method or product: (ii) the method of its production or manufacture: (iii) the product quality plan prepared in respect of the certified building method or product: (iv) the application or installation instructions for the certified building method or product: (v) any documentation relating to the use and maintenance of the certified building method or product: (c) if the certificate holder has any reason to suspect that the certified building method or product does not comply with the Building Code, the certificate holder notifies the product certification body in writing of the reason for that suspicion: (d) if the certificate holder or the product certification body finds that a certified building method or product that has been released on the market does not comply with the Building Code, the certificate holder discloses that fact in disclosure statements published in a form that is acceptable to the product certification body and to the chief executive: (e) if the certificate is suspended or revoked, the certificate holder— (i) notifies all customers to whom the building method or product is regularly supplied; and (ii) immediately ceases using the certificate, the mark of conformity, and any reference to the number of the certificate.			
End of the document			



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Cavity Fix

Technical Specification

May 2020 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 James Hardie 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.

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1 Product Overview

1.1 Product Information

Linea™ Weatherboard is an external cladding.

Linea Weatherboard is a 16mm thick, pre-primed bevel back fibre cement weatherboard. The bottom front edge of Linea Weatherboard is chamfered. It has tongue and groove ends for jointing and is classified as lightweight wall cladding for use in residential and light commercial buildings using timber or lightweight steel framed external walls. Linea Weatherboard is available in 135mm, 150mm and 180mm widths.

James Hardie also has available:

- Axent™ Fascia is a 16mm thick, pre-primed fibre cement product available in two widths. It's designed to accommodate James Hardie soffit linings.
- Axent™ Trim is a 16mm thick, pre-primed fibre cement product available in two widths. For use as decorative trims around openings and external corners.

For fixing to a steel frame. Ask James Hardie™ on 0800 808 868 for specific requirements. Or refer to the James Hardie cladding to steel framing technical supplement about the installation of Linea Weatherboard to steel frame.

Table 1

Linea Weatherboard and Axent Trim sizes									
							Coverage Information		
Product	Code	Length (mm)	Width (mm)	Thickness (mm)	End details	Effective cover (mm)	No. of planks/ metre height (approx.)	Mass kg/ lineal m (approx. at EMC)	Mass kg/m ² (approx. at EMC)
Linea Weatherboard 135	401844	4200	135	16	T & G	105	9.5	2.62	25.70
Linea Weatherboard 150	402533	4200	150	16	T & G	120	8.3	3.1	24.93
Linea Weatherboard 180	401847	4200	180	16	T & G	150	6.7	3.57	23.92
Axent Trim 84mm	401943	2600	84	16	Square	N/A	N/A	1.6	N/A
Axent Trim 100mm	401930	2600	100	16	Square	N/A	N/A	1.9	N/A

The effective thickness of finished Linea Weatherboard on the wall at the lap is approximately 33 to 35mm

All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Linea Weatherboard is categorised as a Light Weight Wall Cladding as described in the NZS 3604.

1.2 Manufacturing and Classification

The manufacturing process of Linea Weatherboard by James Hardie is ISO 9001 Certified.

Linea Weatherboard is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Linea' printed on the back.

Axent Trim is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Axent' printed on the back. The trims are factory sealed and primed.

Linea Weatherboard and Axent Trim products are manufactured to Australian/New Zealand Standard AS/NZS 2908.2 'Cellulose-Cement Products' (ISO 8336 'Fibre-Cement Flat Sheet').

Linea Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 "Cellulose-Cement Products".

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz and view them in the technical literature section or Ask James Hardie on **0800 808 868**.

1.3 Components and Accessories

Table 2

Accessories/tools supplied by James Hardie			
Accessories	Description	Size (mm)	Code
	External corner soaker 90° for Linea Weatherboards 180mm - Aluminium - Copper - Stainless Steel	200 long	301186 301188 301197
	External corner soaker 135° for Linea Weatherboards 180mm Aluminium	200 long	301178
	External corner soaker 90° for Linea Weatherboards 150mm - Aluminium - Stainless Steel	170 long	302820 302821
	External corner soaker 90° for Linea Weatherboards 135mm - Aluminium - Stainless Steel	155 long	301185 301196
	External Slimline Box Corner Mould Etched primed aluminium extrusion used to create external corner	2700 long 4000 long	301195 305809
	Linea 35mm Cavity Closer	3000 long	306035
	Internal 'W' Mould 90° Etched primed aluminium extrusion used to create 90° internal corner	2700 long 4000 long	301184 305807
	Internal 'W' Mould 135° Etched primed aluminium extrusion used to create 135° internal corner	2700 long	301183
Accessories/tools supplied by James Hardie			

Table 2 contd.

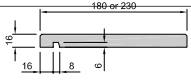
Accessories	Description	Size (mm)	Code
	JH Corner Under Flashing 50 x 50mm PVC moulding used as under fashing for internal and external corners	3000 long	303745
	Axent Trim 84mm	84 x 2600 long	401943
	Axent Trim 100mm	100 x 2600 long	401930
	Axent Fascia - 180mm - 230mm	4200 long	401843 402230
	HardieFlex™ Galvanised nail - 5kg	60 x 3.15mm	302784
	HardieFlex™ Stainless steel nail - 5kg	60 x 3.15mm	302782
	HardieBlade™ Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included	4 tooth - 184mm	300660
	HardieBlade™ Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included	6 tooth - 254mm	303375
	Gecko Gauge This easy to use tool gauges and supports the weatherboard for a one person install.		305941

Table 3

Accessories not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with its Linea Weatherboard and Axent Trim. James Hardie does not supply these products. There may also be some other accessories required depending upon the application. Please contact component manufacturer for information on their warranties and further information on their products.

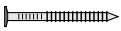
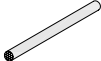
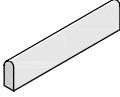
Accessories	Description	Size (mm)	Material/ appearance
	Flexible Underlay To comply with Table 23 of E2/AS1		
	D head or RounDrive Nail Gun nail for concealed fixing Linea Weatherboard.	60 x 2.87	Hot Dip Galvanised/ Stainless Steel
	HardieFlex™ Hot Dip Galv. Nails For concealed fixing by hand nail	60 x 3.15mm 75 x 3.15mm	Hot Dip Galvanised/ Stainless Steel
	Jolt Head Nail for face fixing Linea Weatherboard	75 x 3.15mm 90 x 3.55mm	Hot Dip Galvanised/ Stainless Steel
	Titanium Coated High Speed Drill Bit. For pre-drilling prior to face fixing with jolt head.	3.0mm 3.5mm	
	Brad Nail To tie boards together	32mm	
	Joint sealant Paintable flexible sealants are recommended for filling the joints. Refer to Section 7.2 for information.	Tube	Sika, Bostik or similar Holdfast
	CRC ADOS Builders Fill Two part exterior grade fill to finish over jolt head nails.		
	PEF Rod	Polyethylene foam	Sika or similar
	Flexible tape A flexible self-adhesive tape used in preparation of a window. Refer to the Window installation section in this manual for more information.	Proprietary tape to adhere to flexible underlay	Tyvek, Marshall Innovations or similar
	Flashing Material as per Table 20, 'E2/AS1'		Flashing Fabricator
Dimension to suit 	Planted Sill		H3.1 minimum Treated Timber Timber Merchant or cut on site

Table 3 contd.

Accessories not supplied by James Hardie			
Accessories	Description	Size (mm)	Material/ appearance
	Timber Scribe To scribe beside window, site cut to suit.	As required	H3.1 minimum Treated Timber Timber Merchant or cut on site
	Fibre Cement Cutting Blade Diamond tip 305mm diameter circular saw blade to fit drop saw.	305mm	Diamond Tipped
	Cavity Closer - aluminium Used in walls taller than 10m for inter-tenancy fire separation.		
	Primers. Dulux 1-Step Prep, Resene Quick Dry etc.		

2 Application and Scope

2.1 Application

This specification includes the installation of Linea Weatherboard cavity construction where risk matrix is 13 or more and must be read in conjunction with the current CodeMark Certificate and BRANZ Appraisal. This installation method can also be used for buildings where the risk matrix score is 0 - 12 if desired.

This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Linea Weatherboard. The document also serves the purpose of an installation manual for this product.

For use of Linea Weatherboard outside this published scope, 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.

Refer to the Linea Weatherboard Direct Fixed Technical Specification when installing Linea Weatherboard without a cavity.

2.2 Scope

Linea Weatherboard cavity construction is suitable for use in timber framed buildings that fall within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

Linea Weatherboard cavity construction is also suitable for use in specific engineering design projects (SED) subject to a wind pressure of 2.5kPa (ULS) maximum for building heights upto 25m.

2.3 Limitations

- Linea Weatherboard cladding must not be used on curved wall applications
- Linea Weatherboard cladding must not be installed vertically or angled
- The minimum ground clearances specified must be maintained
- Timber window joinery/recessed openings is subject to an alternative design by the designer
- Maximum SLS inter-story seismic deflections up to span/180 when used in specific design buildings (SED) buildings above 10m height. To accommodate higher inter-story drifts, a deflection should be used.

2.4 Details

Various typical Linea Weatherboard details are provided within this document. In addition to these, the construction details with HomeRAB™ Pre-Cladding/RAB™ Board have also been developed and are available on our website. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded at **www.jameshardie.co.nz**.

All dimensions shown are in millimetres unless noted otherwise.

3 Compliance

3.1 NZBC Compliance

When installed in accordance with the conditions of CodeMark number GM-CM30018 Linea Weatherboard complies with all relevant requirements of the NZBC.



Please refer to www.building.govt.nz for a copy of the certificate.

Linea Weatherboard cavity fixed cladding also has a BRANZ Appraisal number 447 (2010) available at www.branz.co.nz or www.jameshardie.co.nz.



4 Design

4.1 Responsibility

The specifier or other party responsible for the project must ensure that the information and details 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 technical specification.

All New Zealand Standards referenced in this manual are current edition and must be complied with.

Specifier

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.

Installer

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this James Hardie Technical Specification. All the details provided in this document must be read in conjunction with the project specification.

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 their aesthetic expectations before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation. James Hardie will only offer a replacement product if Linea Weatherboard or Axent Trim supplied are found to be out of its manufacturing specification.

4.2 Clearances

The clearance between the bottom edge of cladding and the paved/unpaved ground must comply with section 9.1.3 of E2/AS1. On the roofs and decks the minimum clearance must be 50mm. These clearances must be maintained throughout the life of the building.

Linea Weatherboard must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by the NZBC Acceptable Solution, E2/AS1 Table 18.

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'.

Do not install cladding such that it may remain in contact with water or ground, refer to figures in section 9 of this manual.

4.3 Structure

4.3.1 Timber Framing

Timber framing must be in accordance with NZS 3604 (Timber-framed buildings) or designed as for specific engineering design (SED) in accordance with NZS 3603 and AS/NZS 1170 where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604.

The stud spacing must not exceed 600mm centres maximum for buildings within the scope of NZS 3604 and 400mm centres maximum for wind pressures more than 1.5kPa (ULS).

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.

4.3.2 Durability

Timber framing must be treated to a minimum H1.2 treatment requirements and comply with Acceptable Solution B2/AS1 'Durability' of the NZBC. For further timber treatment information refer to the NZS 3602 (Timber and Wood-Based Products for use in Buildings) for minimum timber treatment selection and treatment requirements. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers. Refer to the NZS 3602 for information about the allowable moisture content in timber framing.

4.4 Structural Bracing

Bracing can be achieved by using HomeRAB™ Pre-Cladding or RAB™ Board installed direct to framing instead of a flexible underlay or by using Villaboard™ Lining bracing system on the internal face.

4.5 Energy Efficiency

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

4.6 Fire Rated Walls

External walls with Linea Weatherboard cavity fix construction method can achieve fire ratings up to 60/60/60 when constructed in accordance with the James Hardie Fire and Acoustic Design Manual. Linea Weatherboard must be face fixed for fire rated applications.

Refer to the Fire and Acoustic Design Manual for further information about fire rated systems.

4.7 Control of External Fire Spread

External spread of fire (clause C3.5 and C3.7) apply where:

- Building height is greater than 10m and upper floors have sleeping uses or are different property (C3.5), and
- Where the building is located within 1m of a relevant boundary (C3.7)

Refer to Table 5.1 of Section 5.4 of C/AS1 for group SH or table 5.5 of Section 5.8.1 of C/AS2 for the other risk groups to identify the external fire spread requirement applicable to the external cladding material and surface finish.

For the other situations where 'no requirement' is listed, Linea Weatherboard installed as per the details published in this specification complies.

For buildings that are >10m high and contain tenancies above as per Table 5.5. of C/AS2, Linea Weatherboard installed over timber cavity battens in conjunction with RAB™ Board with R2.2 fibreglass/James Hardie mineral insulation complies. Refer to Figure 38 and 39 for RAB™ Board and cavity batten layout. For the complete set of suitable Linea Weatherboard cavity construction details with RAB™ Board for this application, refer to www.jameshardie.co.nz.

4.8 Alpine regions

In regions subject to freeze/thaw conditions, Linea Weatherboard must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions subject to snow drifts over winter.

The Linea Weatherboard has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

5 Safe Working Practices

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

James Hardie 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/NZS1716 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 and when cleaning up
- 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 HardieBlade™ logo 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.

When cutting

- ✓ Work outdoors only
- ✓ 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
- ✓ Rotate employees across cutting task over duration of shift
- ✓ Cut products with a HardieBlade 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 (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
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

Working Instructions

HardieBlade™ Saw Blade

The HardieBlade Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James 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

5.1 Storage and delivery

Keeping products and people safe

Off loading

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

Storage

James Hardie 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

James Hardie 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.

5.2 Tips for safe and easy handling of weatherboard products

Weatherboard products

- ✗ Do not lift planked products flat and in the middle
- ✓ Carry the products on the edge
- ✓ If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- ✓ If two people are carrying the plank, hold it near each end and on edge
- ✓ Exercise care when handling weatherboard products to avoid damaging the edges/corners

6 Installation

The horizontal lap between the two Linea Weatherboard must be 30mm minimum. In certain scenarios you may require to creep up the lap, this must not exceed 33mm.

Linea Weatherboard must be kept dry whilst in storage prior to and during fixing. Site cut ends that are exposed such as slimline box corners, internal corners etc. and any sanded patches on the boards surface must be primed prior to installation. Dust and loose material must be removed before priming.

6.1 Fastener

6.1.1 Fastener – Size and Method

Linea Weatherboard and Axent Trim must be fixed to timber with the types of nails specified in Tables 4 and 5, in accordance with the following requirements:

- Linea Weatherboard can either be face/exposed fixed or concealed fixed
- Linea Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing, refer to figures in section 9 of this manual
- All concealed nails must be driven flush with the board surface
- When concealed fixing Linea Weatherboard, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Linea Weatherboard must be face fixed, refer to figures in section 9 of this manual
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 6.1.2
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised by fixing a jolt head nail through the lap as per the exposed nailing method. Refer to figures in section 9 of this manual
- When using concealed fixing method, Linea Weatherboard may be tied together by face fixing through the lap using a 32mm brad nail if desired.
- When face fixing Linea Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail

Table 4

Wind pressure (kPa)	Underlay	Fixing method	Fixing type	Instructions
Up to 1.5 (up to and including VH Wind Zone)	Flexible underlay	Concealed nailing	60 x 3.15mm HardieFlex™ nail or a 60 x 2.87mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	75 x 3.15mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3mm drill bit.
	Rigid air barrier	Concealed nailing	75 x 3.15mm HardieFlex™ nail or a 75 x 3.06mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	90 x 3.55mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.
1.5 to 2.5 (EH Wind Zone and SED projects)	RAB™ Board	Face nailing	90 x 3.55mm jolt head nail	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.

Table 5

Nail requirements for Axent Trim	
Single thickness	60mm jolt head nails. If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit.
Single thickness plus packer	If fixing over Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit. When fixing to timber support use 60mm jolt head nails.

For fire rated wall applications the Linea Weatherboards must be face fixed. For more information Ask James Hardie on 0800 808 868.

6.1.2 Gun Nailing

Linea Weatherboard can be gun nailed with a D-Head or RounDrive nail when concealed fixing method is used.

- Nails must be no closer than 50mm from the ends of boards when gun nailing is used, double studs will be required.
- Be minimum length and nearest gauge as per Table 4.
- Be finished flush with surface of board.

6.1.3 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. Refer to Table 6 for fixing materials requirements to be used in relation to the exposure conditions.

Table 6

Exposure conditions and nail selection prescribed by NZS 3604		
Zone	Application	
D (sea spray) and geothermal hot spots	General	Stainless steel 304/316
	Fire	
*C and B	General	Hot dip galvanised**
	Fire	

* Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made. Microclimatic 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.

6.2 Framing

Framing to be in accordance with the NZS 3604. The following must be provided for fixing Linea Weatherboard:

- Studs at 600mm centres maximum for all wind speed zones up to and including very high (VH)
- Studs at 400mm centres maximum for wind pressures more than 1.5 kPa (ULS)
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.1 Specific Engineering Design (SED)

For EH wind zone and specific engineering design projects the timber framing is required to be designed in accordance with NZS 3603 and AS/NZS 1170. The minimum framing sizes and layout must comply with this specification:

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.2 Gable Ends

In case of gable end trusses sitting on top plates of the 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 independent design producer statement.

6.2.3 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 and the manufacturer's specifications. All framing must be made flush. The visual aspects of the finished cladding can differ between two different sites or the builders installing the product. It is recommended that you also refer to a building guidance document published by MBIE to understand an acceptable level of tolerances allowed in building materials and workmanship. www.building.govt.nz Guide to tolerances, materials and workmanship in new residential construction 2015

6.3 Flexible Underlay or HomeRAB™ Pre-Cladding

Flexible underlay or HomeRAB™ Pre-Cladding must be provided to comply with the requirements of E2/AS1 up to and including very high wind zone.

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. HomeRAB™ Pre-Cladding is suitable for use as an air barrier and must be installed in accordance with HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

6.4 Intermediate Support

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity must be installed. An acceptable method to achieve this is using one of the following:

- Intermediate cavity batten between the studs; or
- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut.

No intermediate supports are required:

- Where studs are at maximum 400mm centres; or,
- When rigid sheathings instead of flexible underlays are used.

6.5 Rigid Air Barrier

In EH wind zone or for specific design wind zone, a rigid air barrier i.e. RAB™ Board, must be used instead of flexible underlay.

For buildings more than 10m, RAB™ Board must be used. To achieve the temporary weathertightness using HomeRAB™ Pre-Cladding and RAB™ Board, windows/doors need to be installed with required flashing tapes and seals etc. Refer to HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual for information regarding its installation and to achieve temporary weathertightness.

6.6 Vent Strip

Linea 35mm cavity closer vent strip (uPVC) must be installed at the bottom of all walls constructed using the drained and ventilated for cavity construction method. James Hardie Linea 35mm cavity closer vent strip has an opening area of 1000mm²/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Alternate cavity closer can be used ensuring compliance of E2 and may need to be used with a cant strip.

6.7 Cavity Battens

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

The timber battens must be minimum H3.1 treated to comply with the durability requirements of B2/AS1.

Cavity battens must comply with E2/AS1 and:

- Be minimum 18mm thick
- Be minimum 45mm wide
- Until claddings are fixed the battens need only to be tacked to framing with 40 x 2.8mm nails at 800mm centres maximum (batten fixing is required temporarily to keep them straight on the wall during construction)

6.8 Joints

6.8.1 Jointing

The ends of Linea Weatherboard are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Flexible sealant must be applied to the front of tongue before pushing into the groove at the time of installation. From a visual perspective, the joint line will be visible and must not be hard filled.

6.8.2 Drainage Joint

After every two floors a horizontal drainage joint flashing is required, refer to figures Figure 29 in section 9 of this manual.

6.8.3 External Corner Joint

There are a number of options to select from when detailing external corners:

- 90° corner soaker in aluminium, copper or stainless steel
- 135° corner soaker 180mm aluminium
- Aluminium boxed corners
- Box corners using Axent Trim
- Mitred corners to weatherboards

Refer to figures in section 9 of this manual.

6.8.4 Internal Corner Joint

There are a number of options to select from when detailing internal corners:

- 90° or 135° Aluminium W-mould
- Scribed corner

Refer to figures in section 9 of this manual.

6.9 Junctions and Penetrations

All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea Weatherboard which meet the performance requirements of E2 'External Moisture', an approved document of the NZBC, refer to figures in section 9 of this manual.

7 Finishes

Protective coating of Linea Weatherboard and Axent Trim is required in order to meet the durability requirements of the NZBC.

7.1 Preparation and Priming

The Linea Weatherboard and Axent Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade 2 part builders fill, eg CRC ADOS Builders Fill, allow to cure and using 60 grit sand paper smooth ready for painting. Prime any sanded patch on board surface or the site cut edges that will be exposed.

It is not recommended to seal gap under the lap of weatherboards as it helps in circulation of air behind the weatherboard cladding. However if sealing of the gap is undertaken, the product warranty still applies.

7.2 Sealants

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 Painting

All Linea Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat.

Linea Weatherboard and Axent Trim must be painted within 90 days of installation. Dark coloured paints can be used, i.e. there is no restriction on the Light Reflectance Value (LRV) of paint to be applied. All exposed faces, including the top edges under the sills and bottom edges of Linea Weatherboard, Axent Trim and accessories must be finished with an exterior paint system.

For best aesthetic results a low sheen paint is recommended.

The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

Stainless steel soakers are generally left natural. For painting over stainless steel soakers, refer to paint manufacturer as special preparation and paints are required.

Paint selection and the preparation required is dependent on paint chosen. Refer to the paint manufacturer for information before starting painting.

8 Care and 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 requirements 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 junctions, penetrations, flashings and sealants
- Cleaning out gutters, blocked pipes and overflow pipes as required
- Pruning back vegetation close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned
- The clearances between the bottom edge of Linea Weatherboard and the finished/unfinished ground must always be maintained
- Stainless steel soakers used in extreme coastal conditions or in sea spray zones may show some signs of 'tea staining'. It is an aesthetic issue and to minimise staining soaker must be washed/polished frequently

*Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.

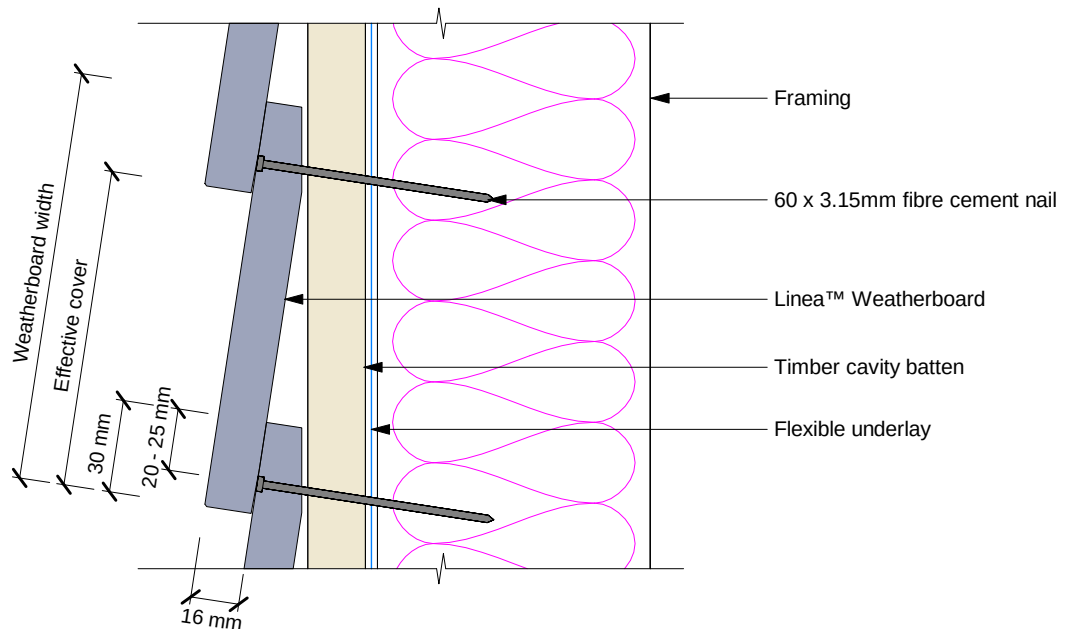
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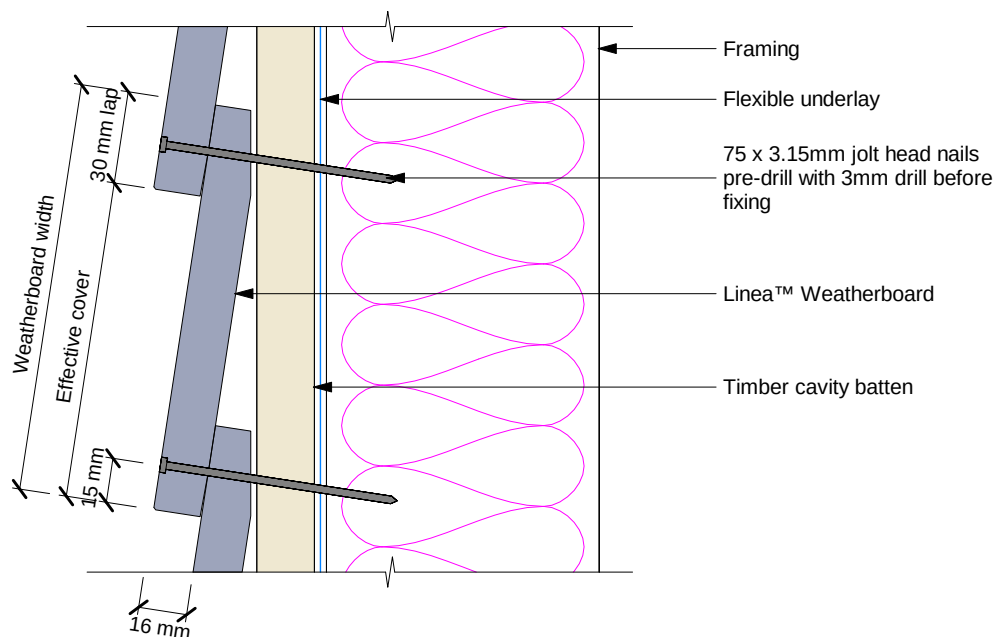
For all meter box details please visit our website at **www.jameshardie.co.nz** or Ask James Hardie on **0800 808 868**.

Figure 1: Weatherboard fixing



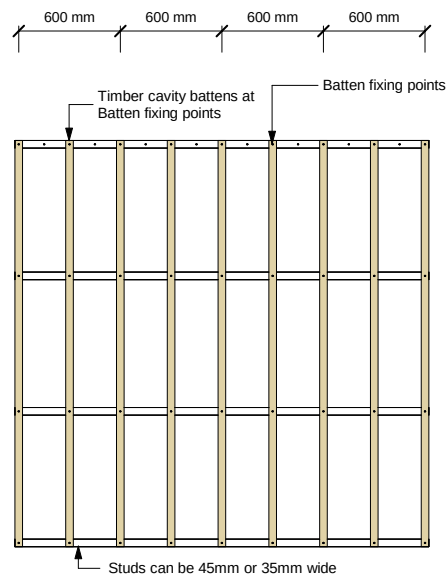
Concealed Nailing

Linea™ Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 4



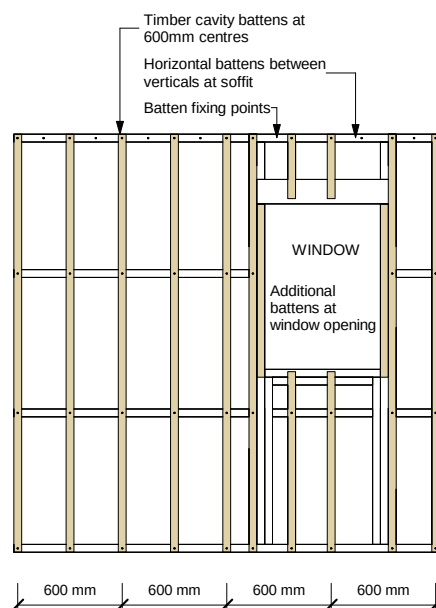
Exposed Nailing

Figure 2: Batten fixing



The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 3: Batten layout at window opening



- Studs can be 45mm or 35mm wide

-The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 4: Foundation detail

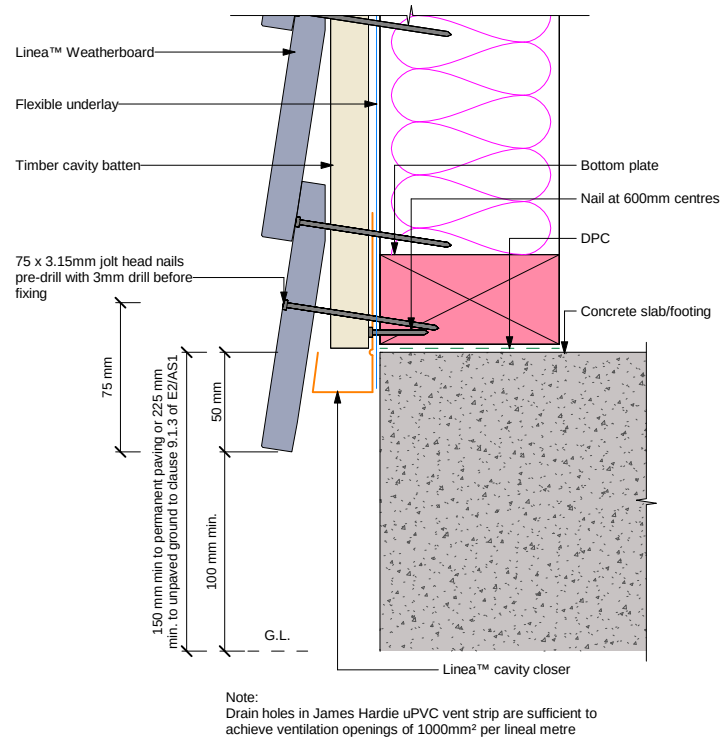


Figure 5: Enclosed Deck

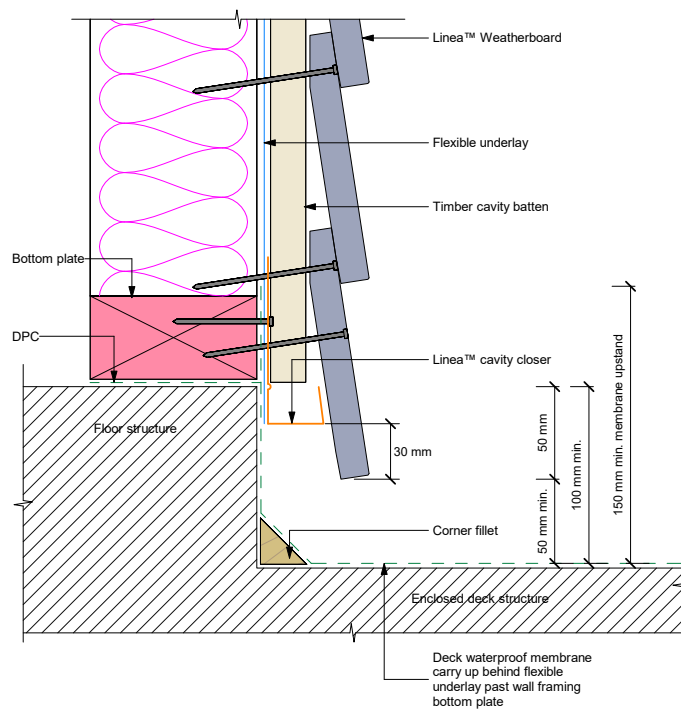


Figure 6: Jointing off stud

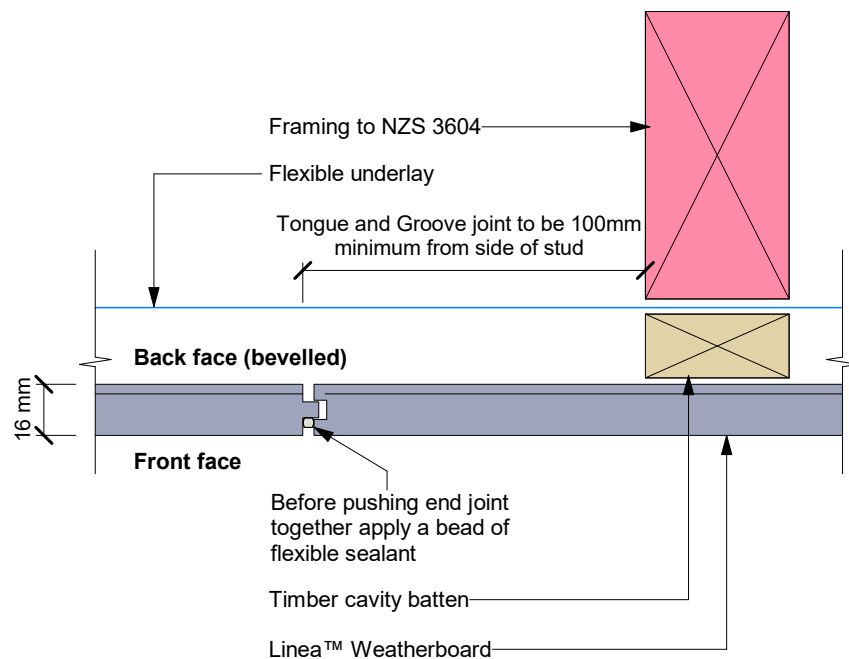
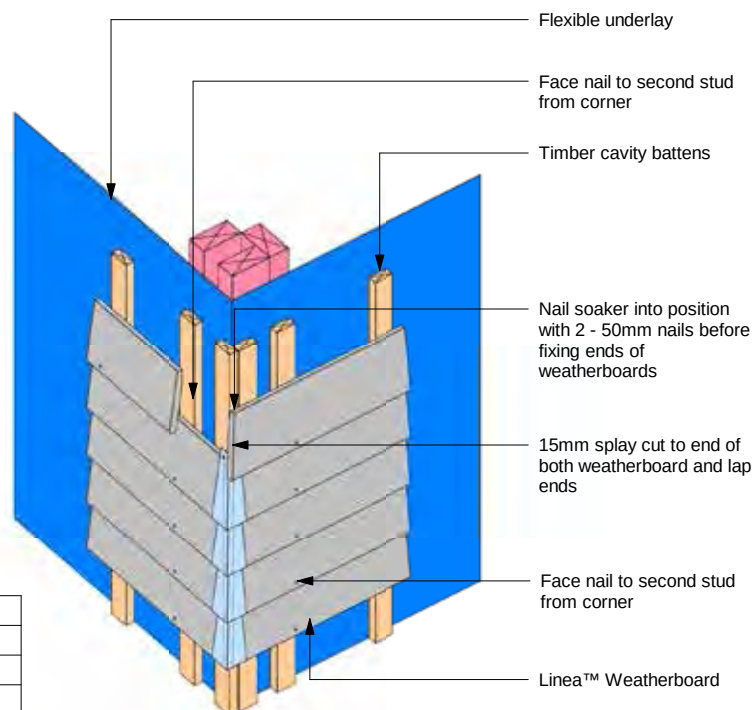


Figure 7: External corner soaker



Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel

Figure 8: Aluminium box corner

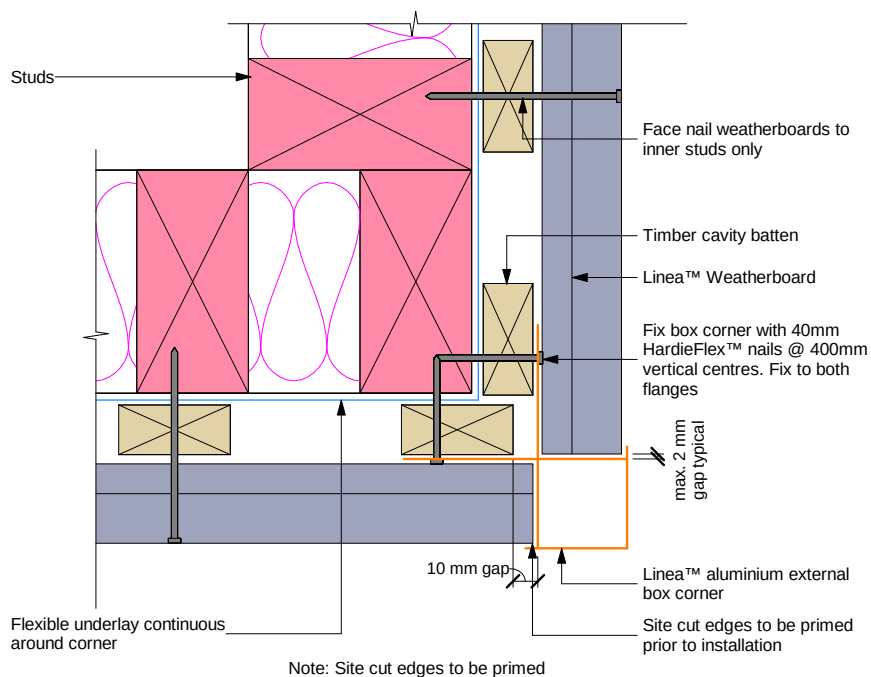


Figure 9: Boxed corner

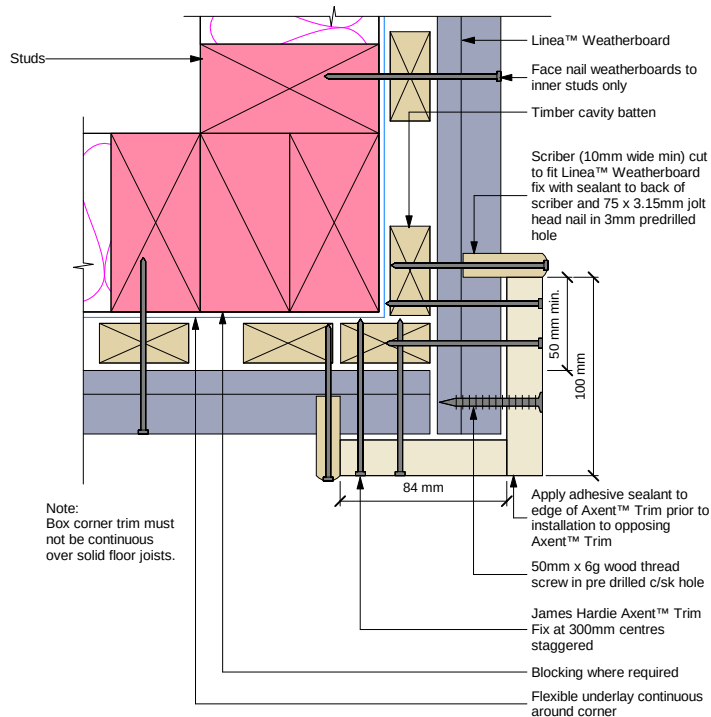
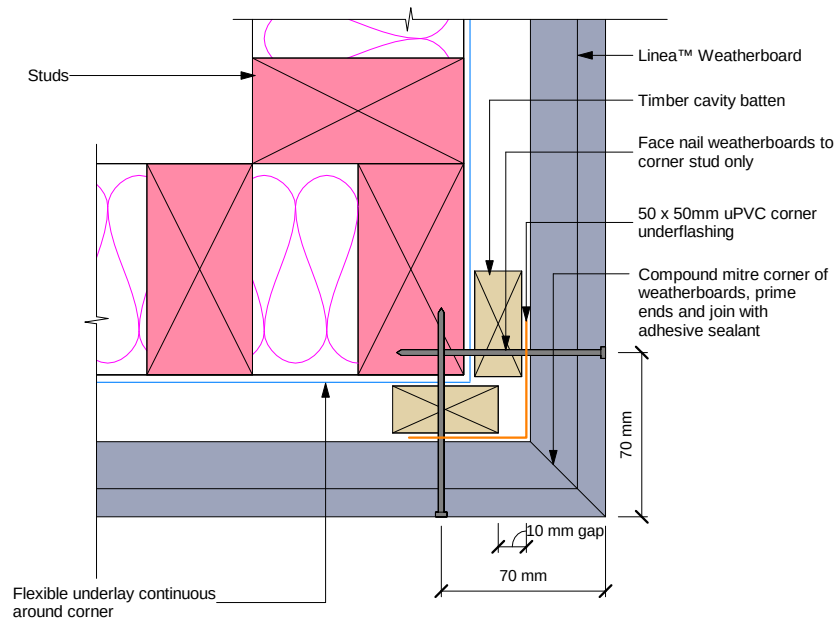


Figure 10: Mitre corner



Note: Adhesive sealant must be used on the full end face of both weatherboards. Push lightly together

Figure 11: Internal 90 ° aluminium 'W' mould corner

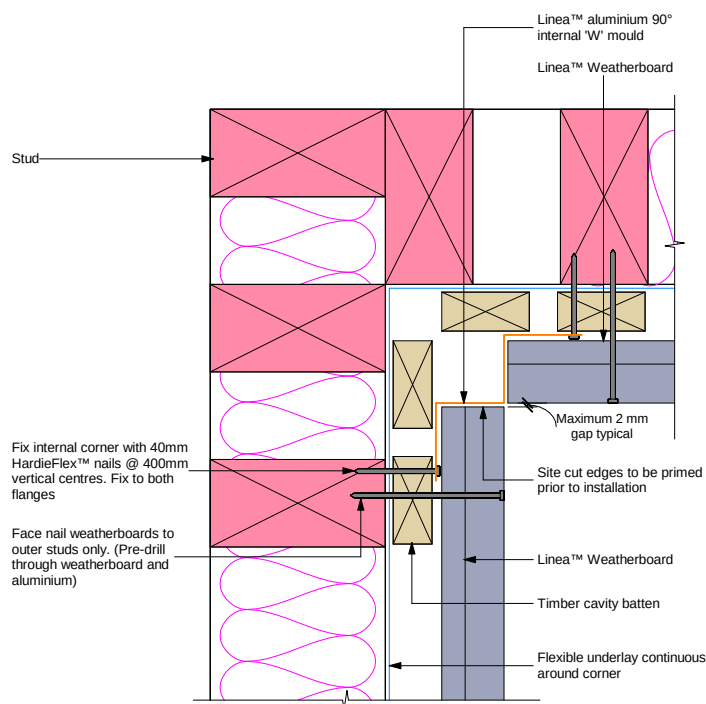


Figure 12: Internal 135 ° aluminium 'W' mould corner

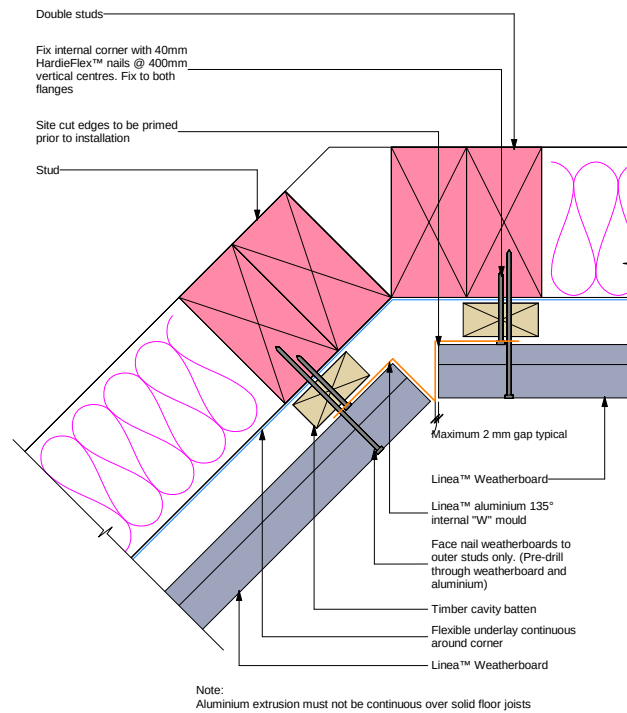


Figure 13: Internal corner joint flashing

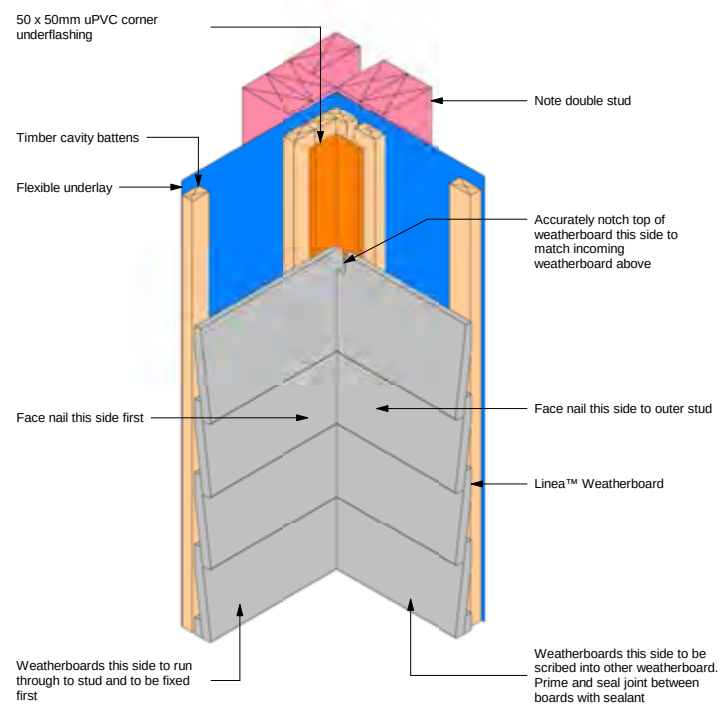


Figure 14: Wall to soffit junction 'X'

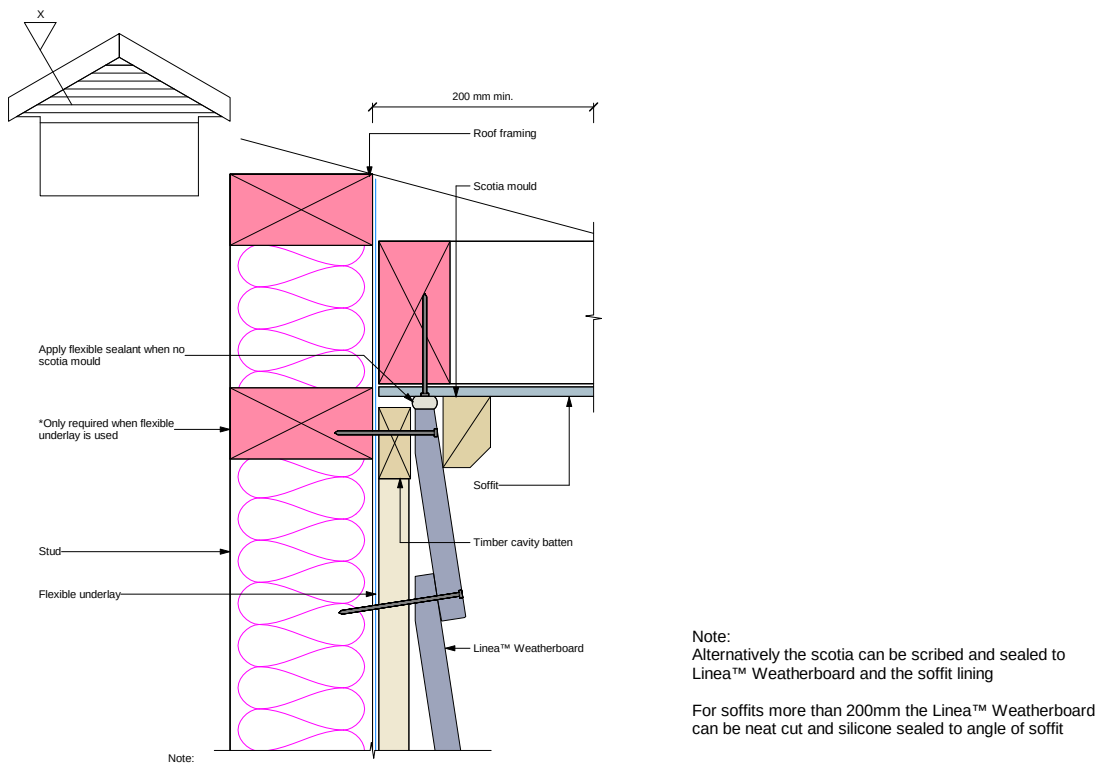


Figure 15: Nil soffit detail

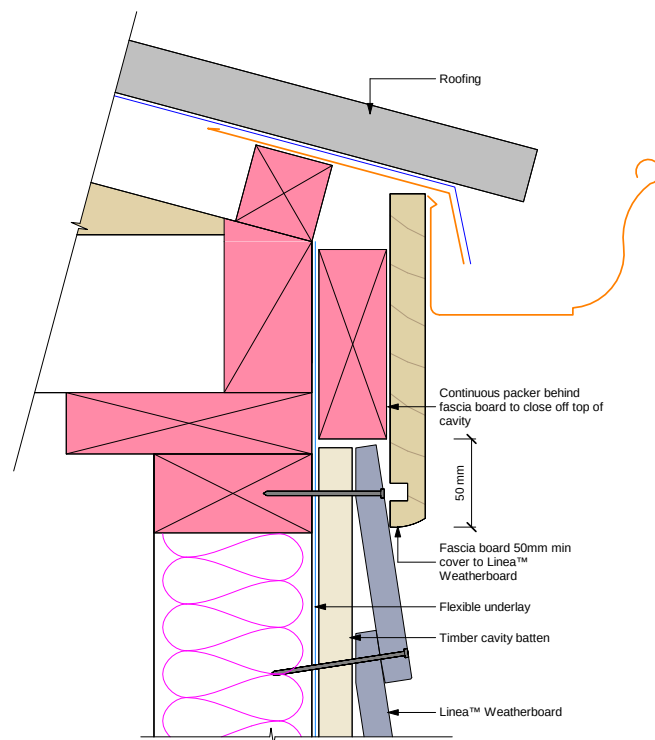


Figure 16: Sloping soffit and wall junction

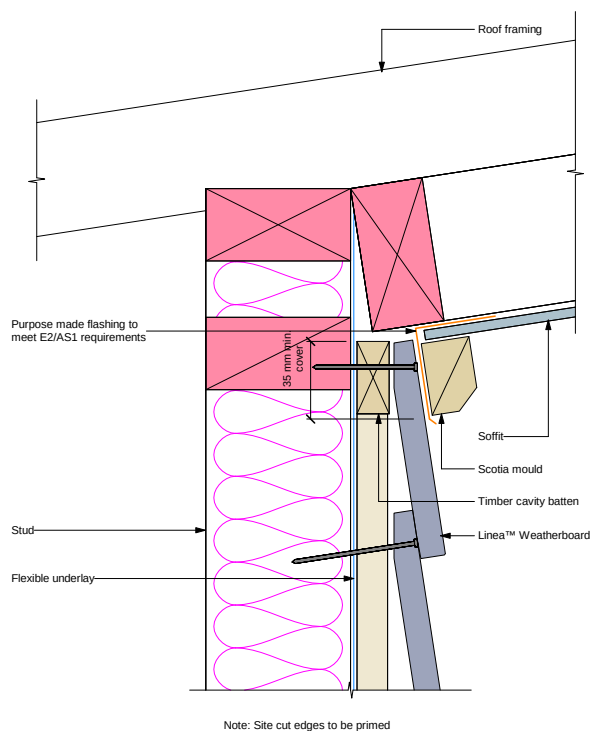
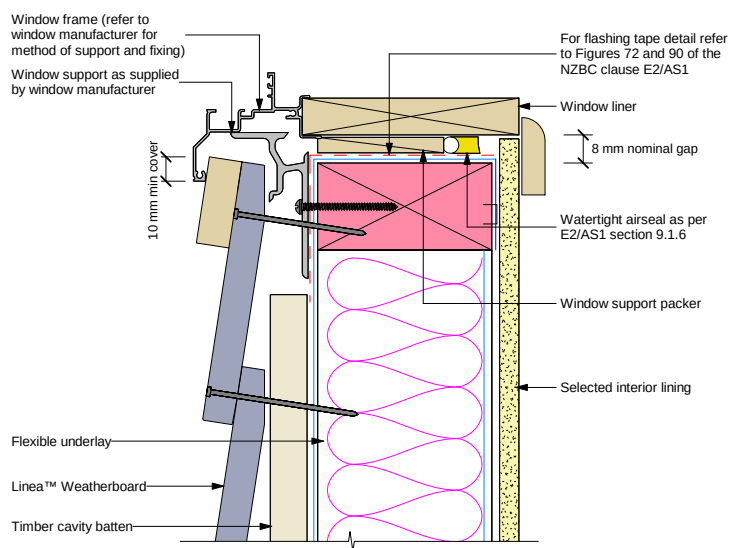


Figure 17: Window and door sill

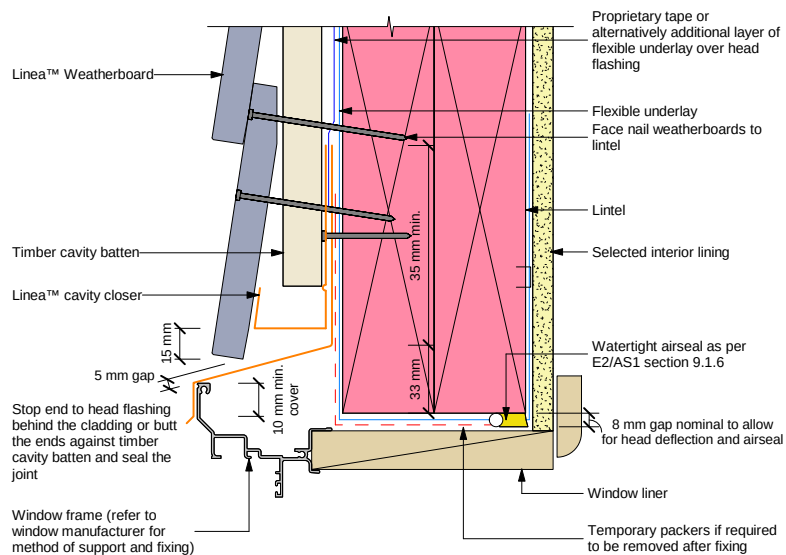


General notes for materials selection

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
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

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

Figure 18: Window head



Note:

- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing
- Site cut edges to be primed

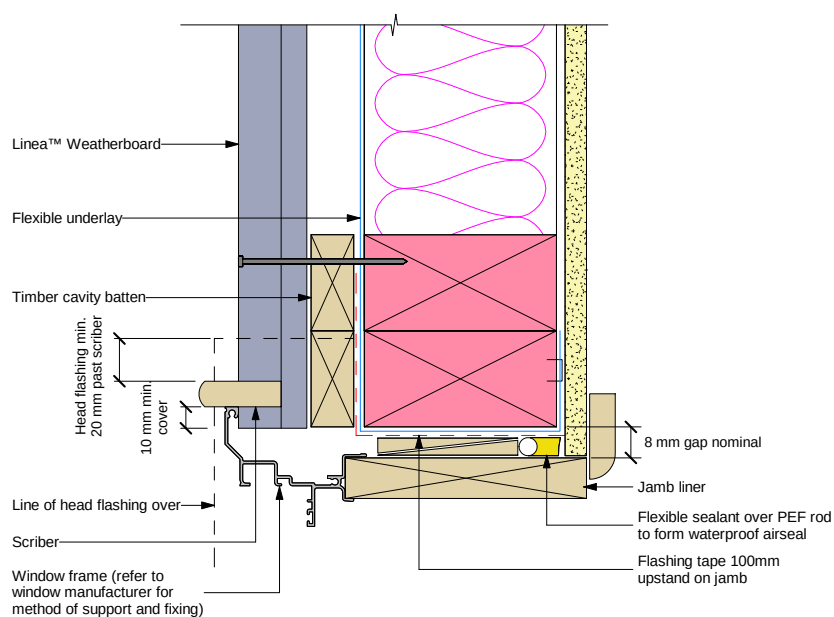
interactive assembly instructions available

<http://wksp.nz/jh-lin-win>



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Figure 19: Window jamb



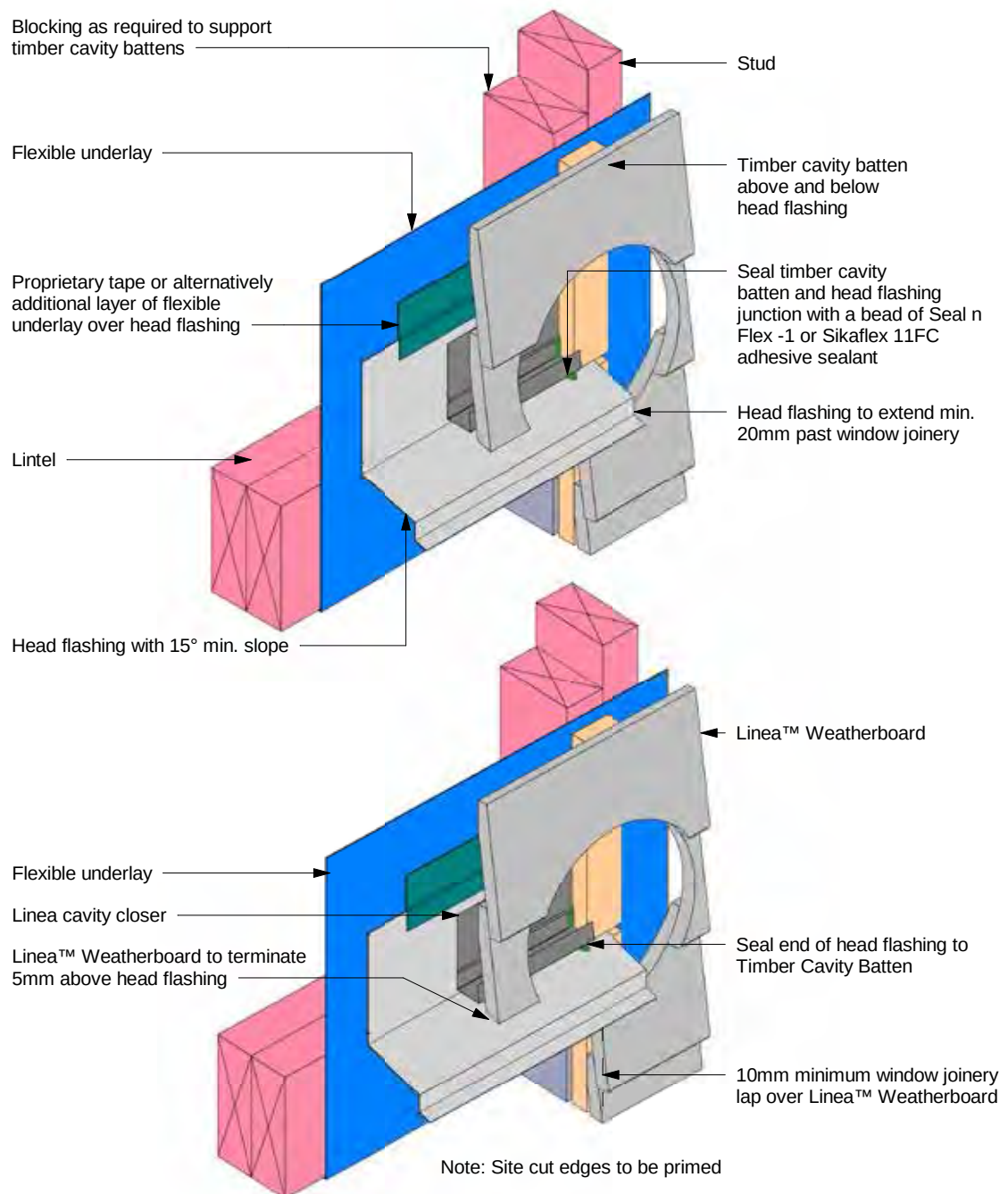
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Figure 20: Window head stop end



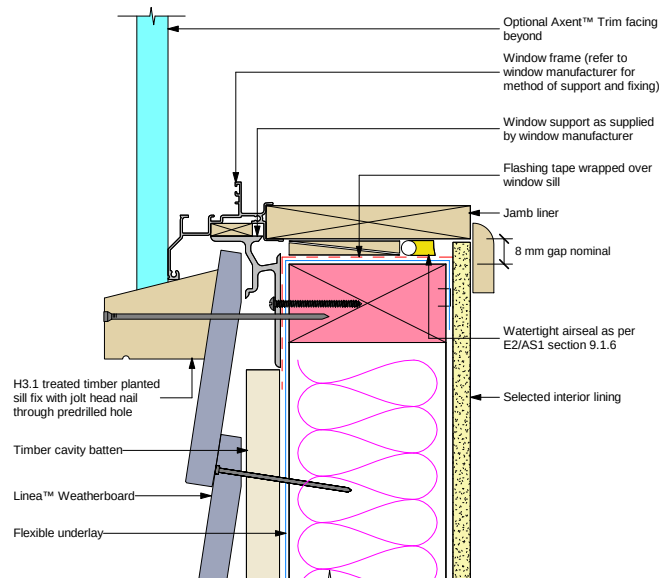
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instructions available

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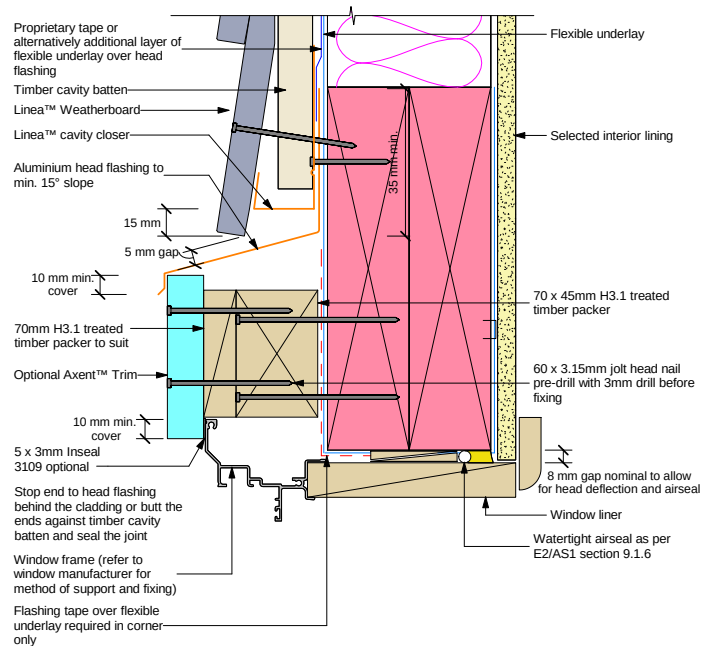
Figure 21: Window sill with facing



- 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
 3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

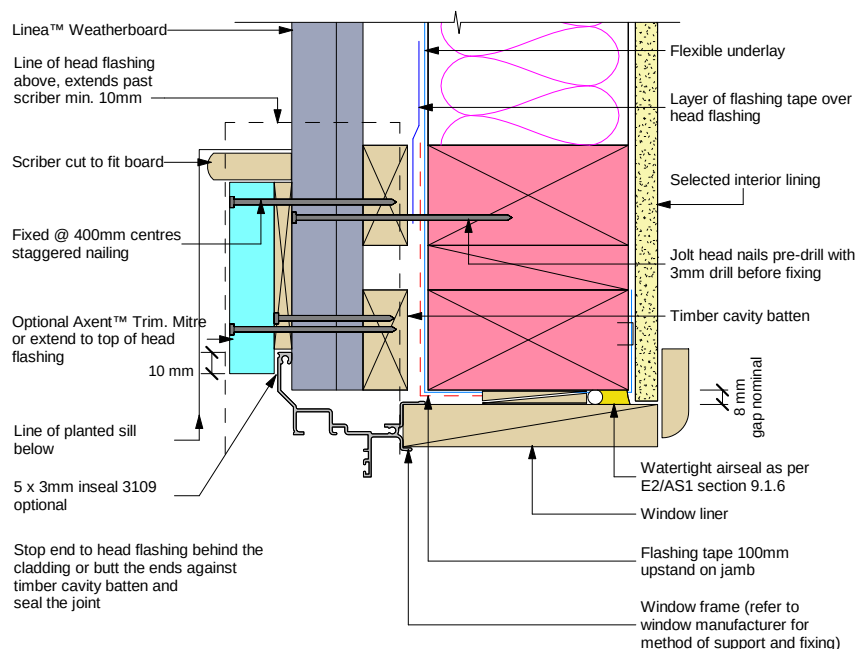
Refer to the manufacturer or supplier for technical information for these materials

Figure 22: Window head with facings



- Note:
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
 - Alternatively, the head flashings can be formed with stop ends as per E2/AS1
 - Refer to Figure 22 for sealing end battens to head flashing

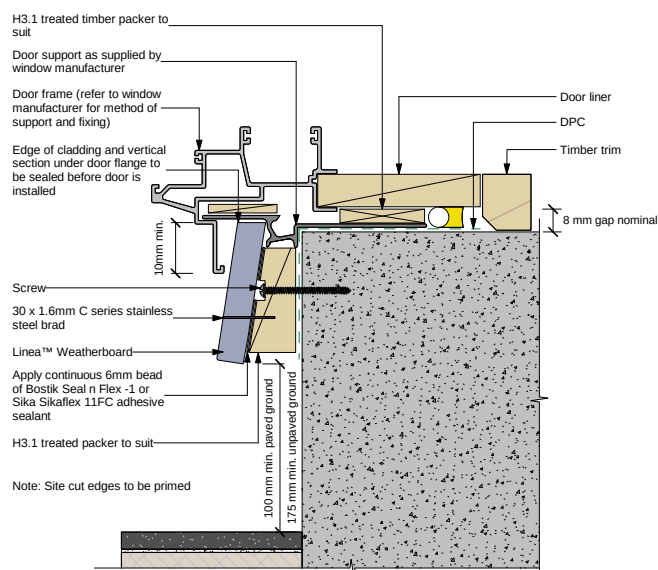
Figure 23: Window jamb with facings



Note:

- Site cut edges to be primed

Figure 24: Door sill support detail



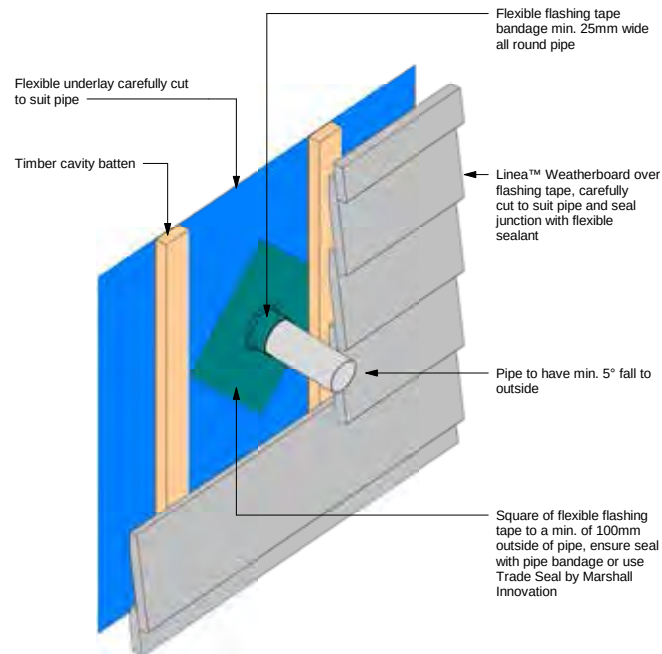
Note: Site cut edges to be primed

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

General notes for materials selection

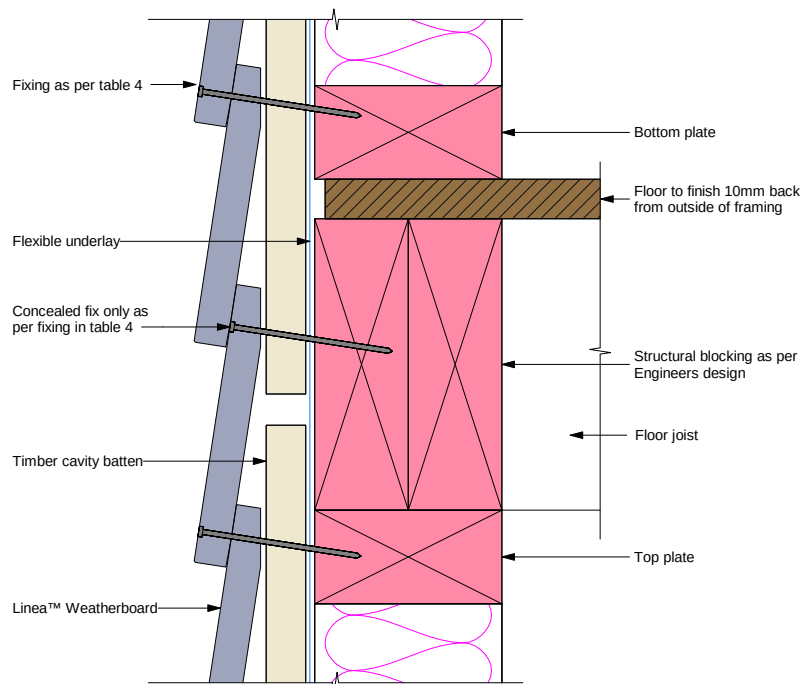
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of the NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. Linea™ Weatherboard to have sealed butt joint over batten at each corner of opening

Figure 25: Pipe penetration



Note: Site cut edges to be primed

Figure 26: Continous cladding over joist

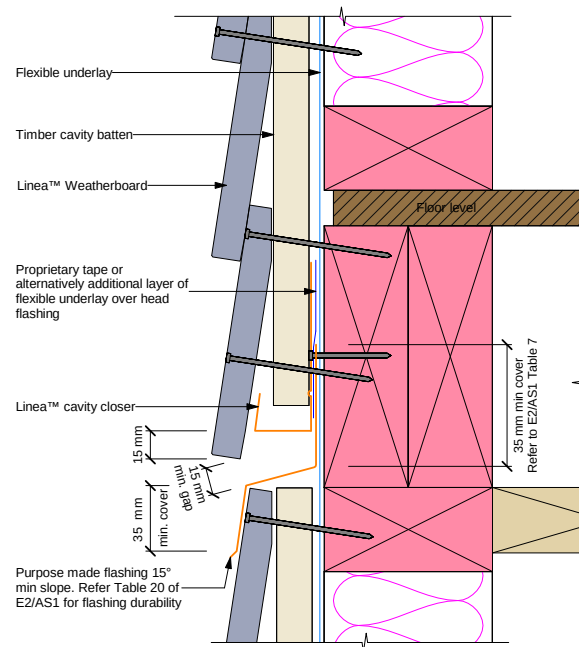


interactive assembly
instructions available
<http://wksp.nz/jh-lin-flj>



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Figure 27: Drained flashing joint at floor level



Note:
This detail is required to limit cavities to a maximum of 2 stories or 7 metres. Refer E2/AS1 clause 9.1.9.4.

Figure 28: Timber deck junction

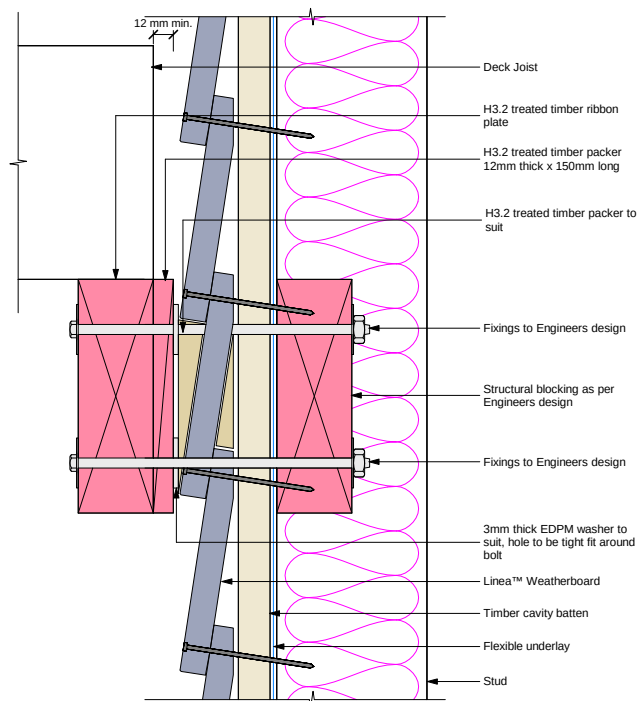


Figure 29: One piece apron flashing joint

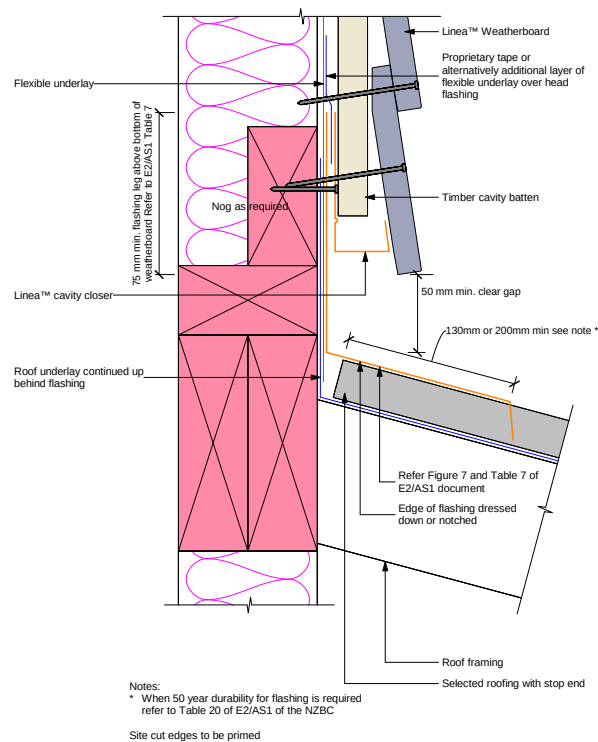


Figure 30: Roof to wall junction detail

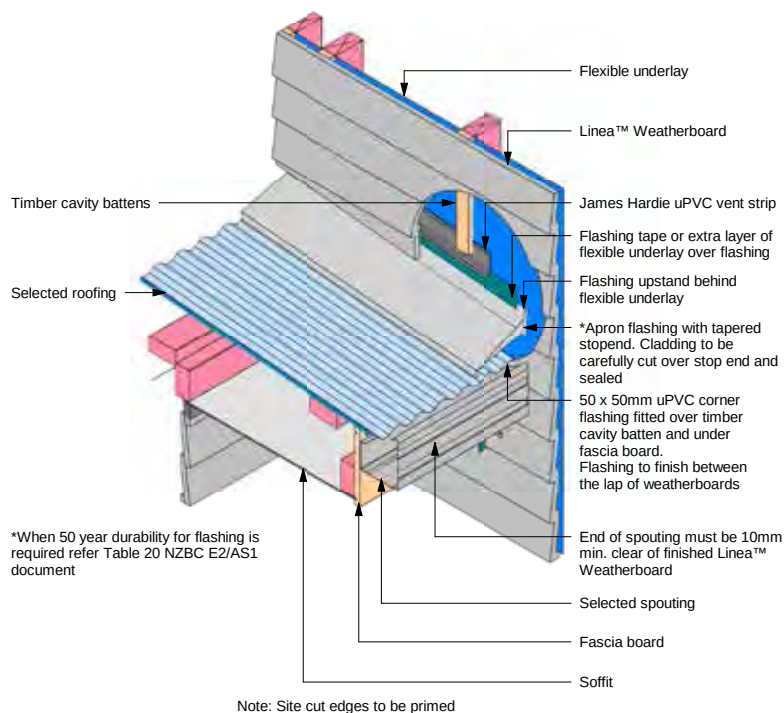


Figure 31: Parapet flashing

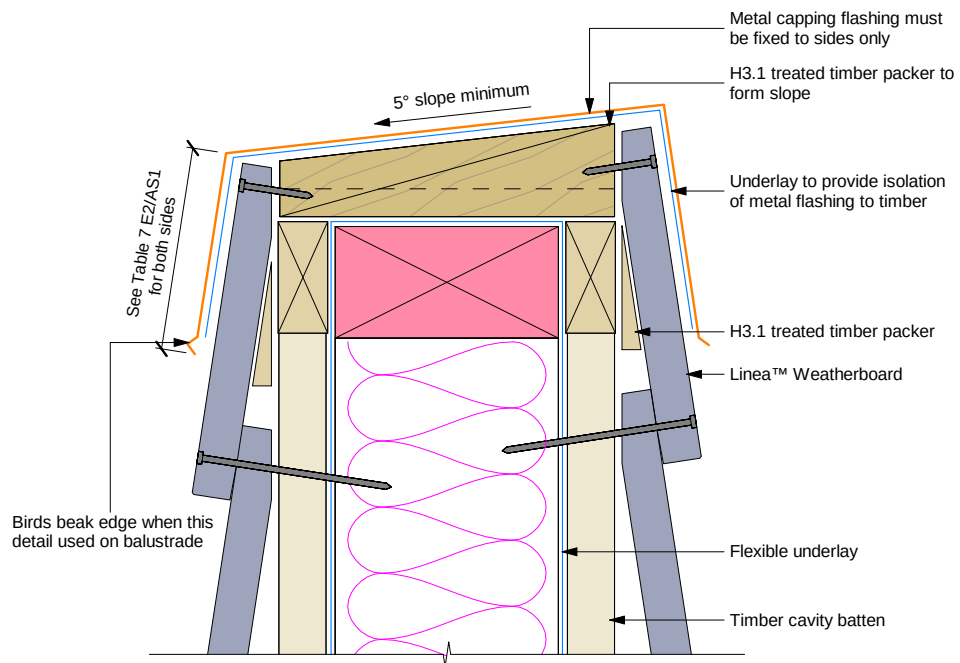


Figure 32: Enclosed deck balustrade to wall

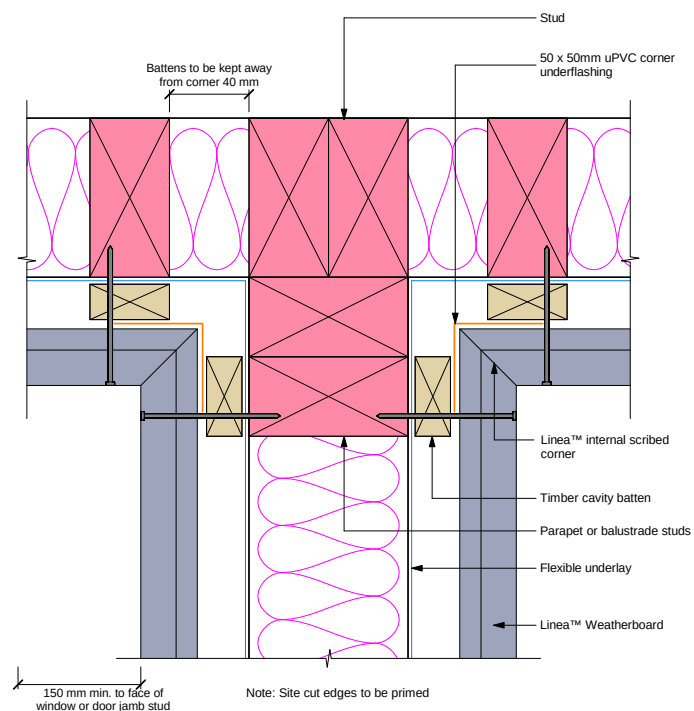


Figure 33: Enclosed balustrade to wall

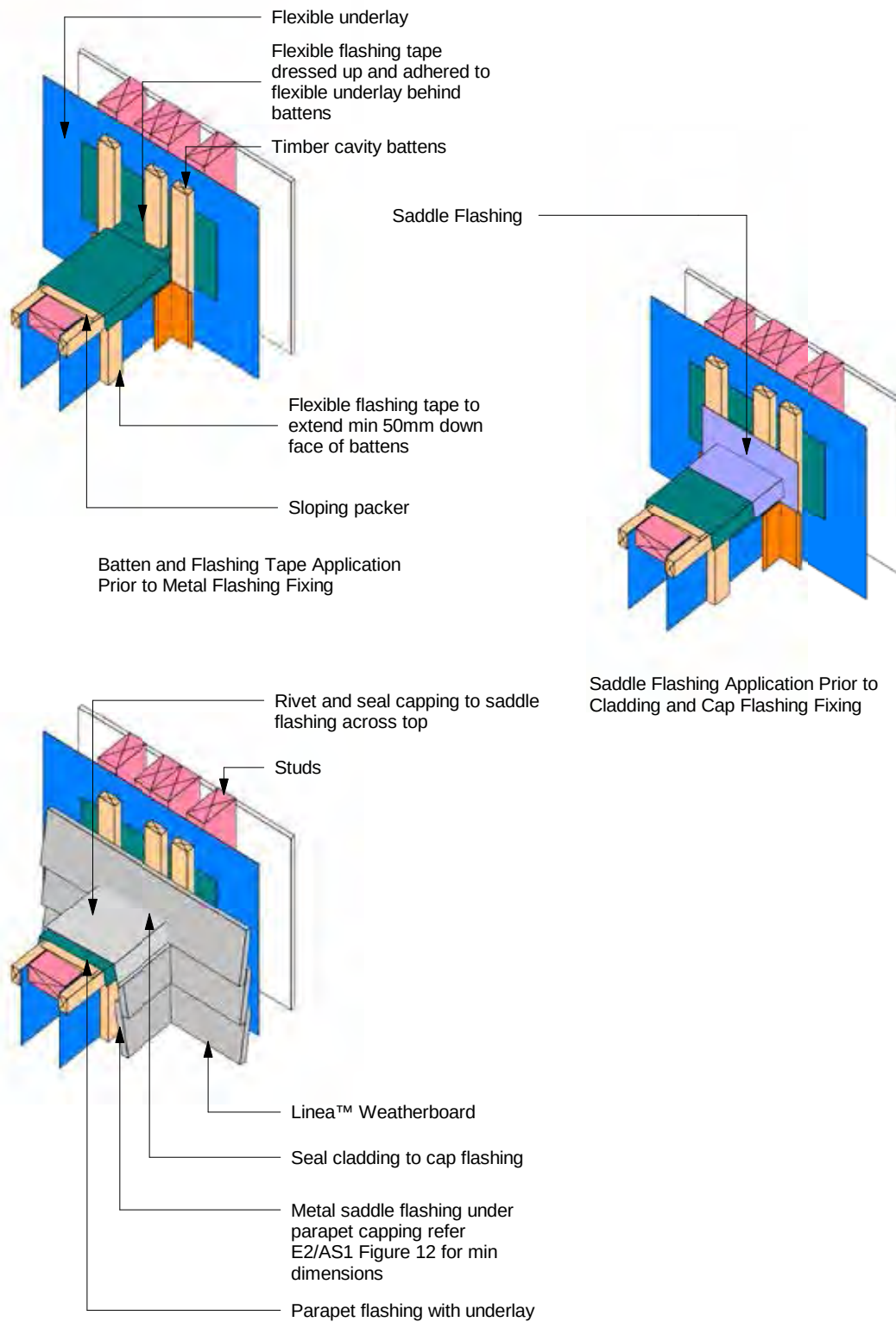
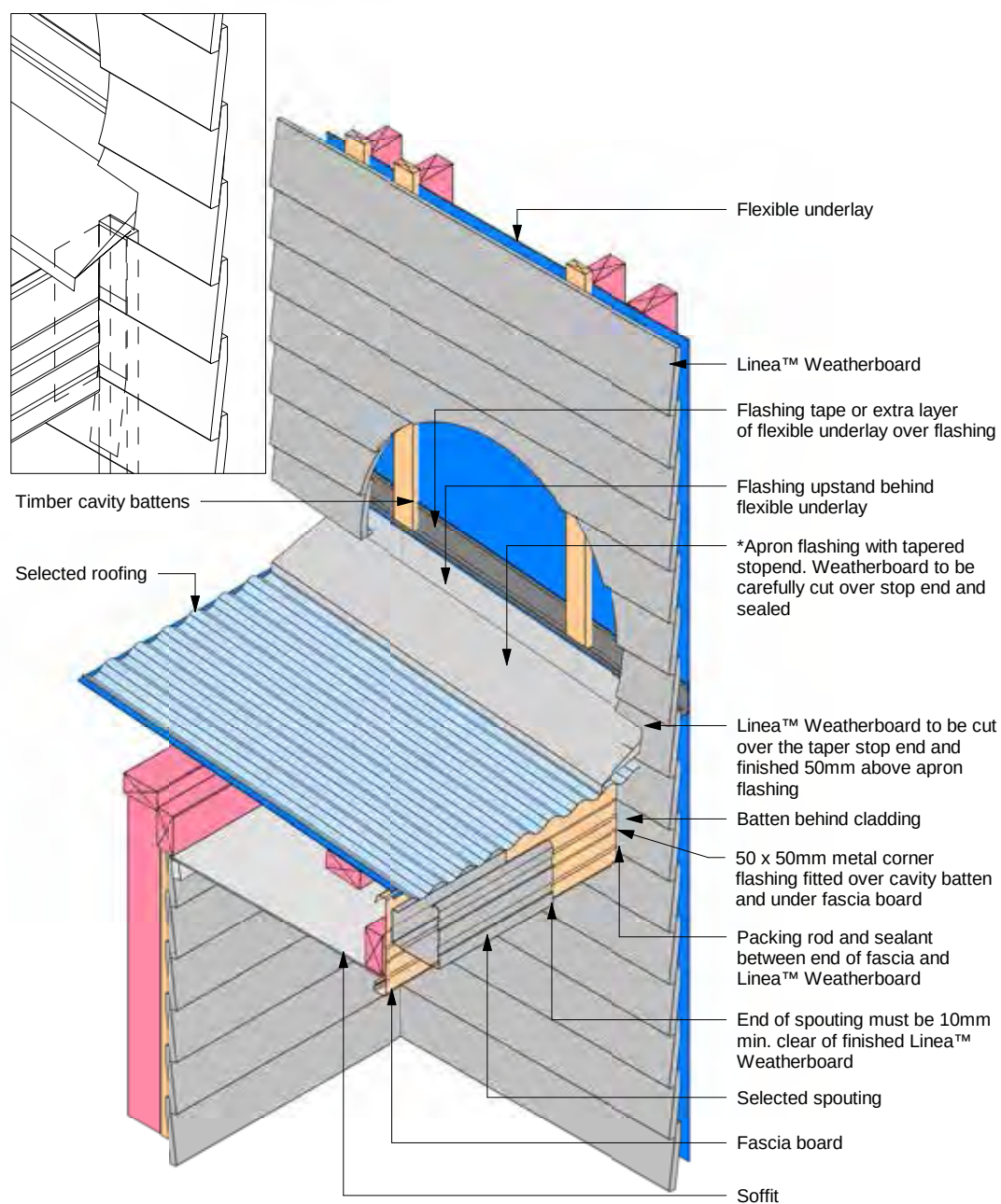


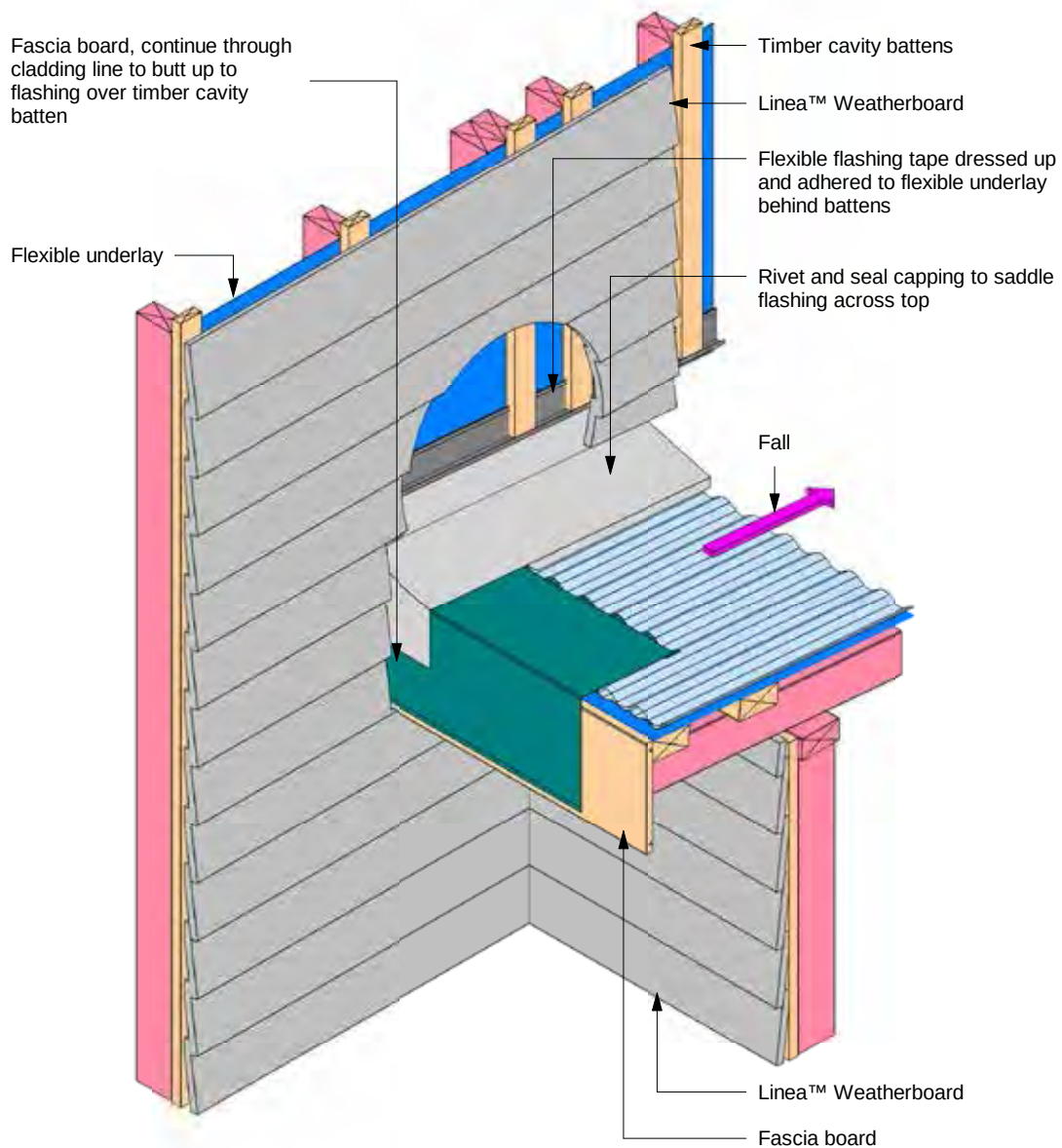
Figure 34: Junction Linea™ Weatherboard and fascia board



*When 50 year durability for flashing is required refer Table 20 NZBC E2/AS1 document

Note: Site cut edges to be primed

Figure 35: Enclosed roof to wall intersection



50mm wide flashing welded to apron flashing

Back flashing

50 x 50mm corner flashing

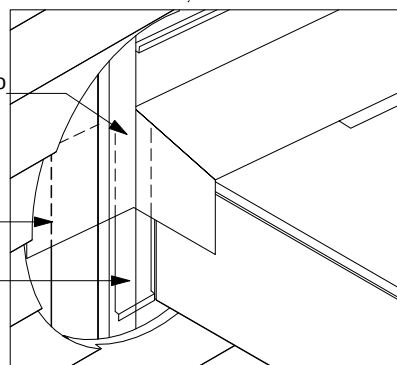
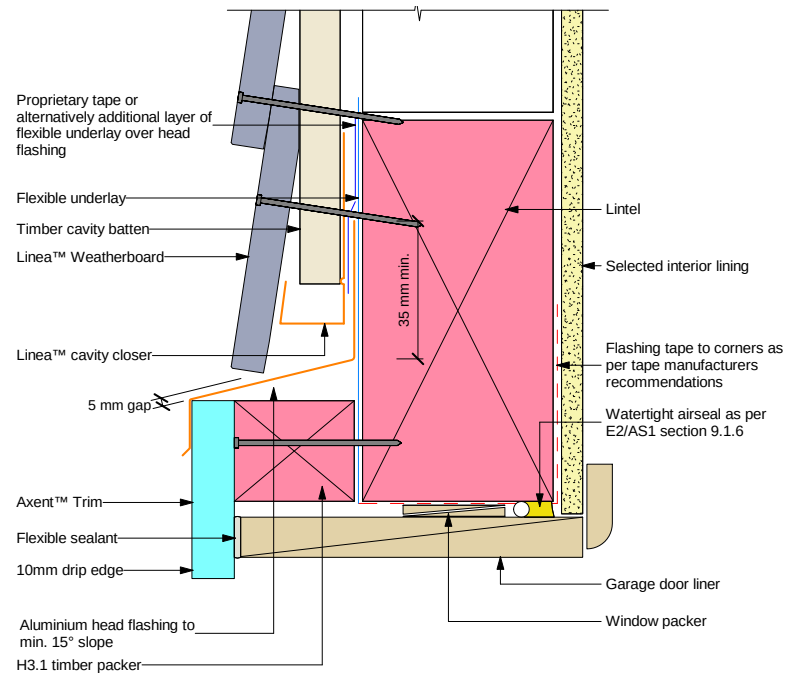


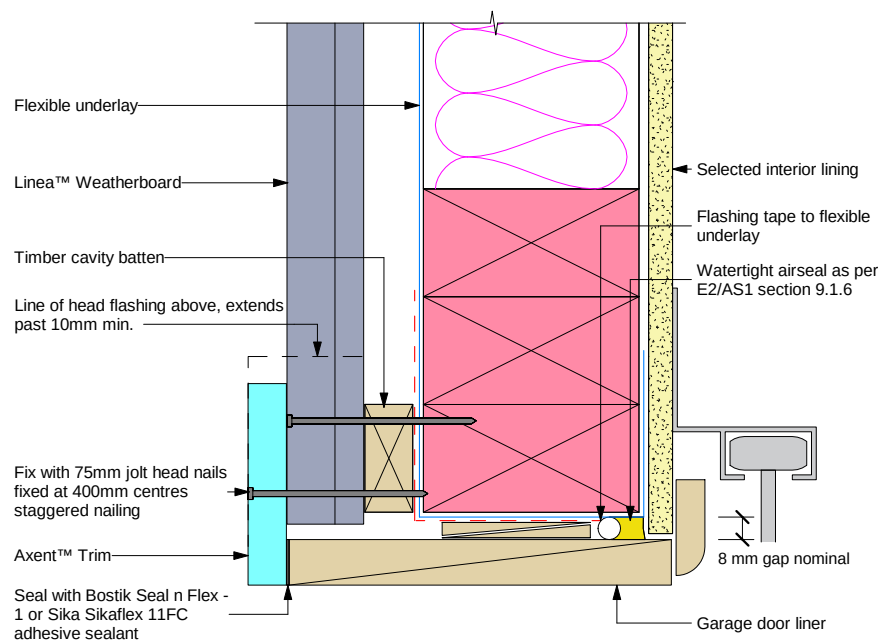
Figure 36: Garage door head



Note:

- Sealant must be applied between head flashing and liner in VH and EH wind zones and SED wind pressures
- Site cut edges to be primed

Figure 37: Garage door jamb



Note: Site cut edges to be primed

Figure 38: Framing setout building height over 10m

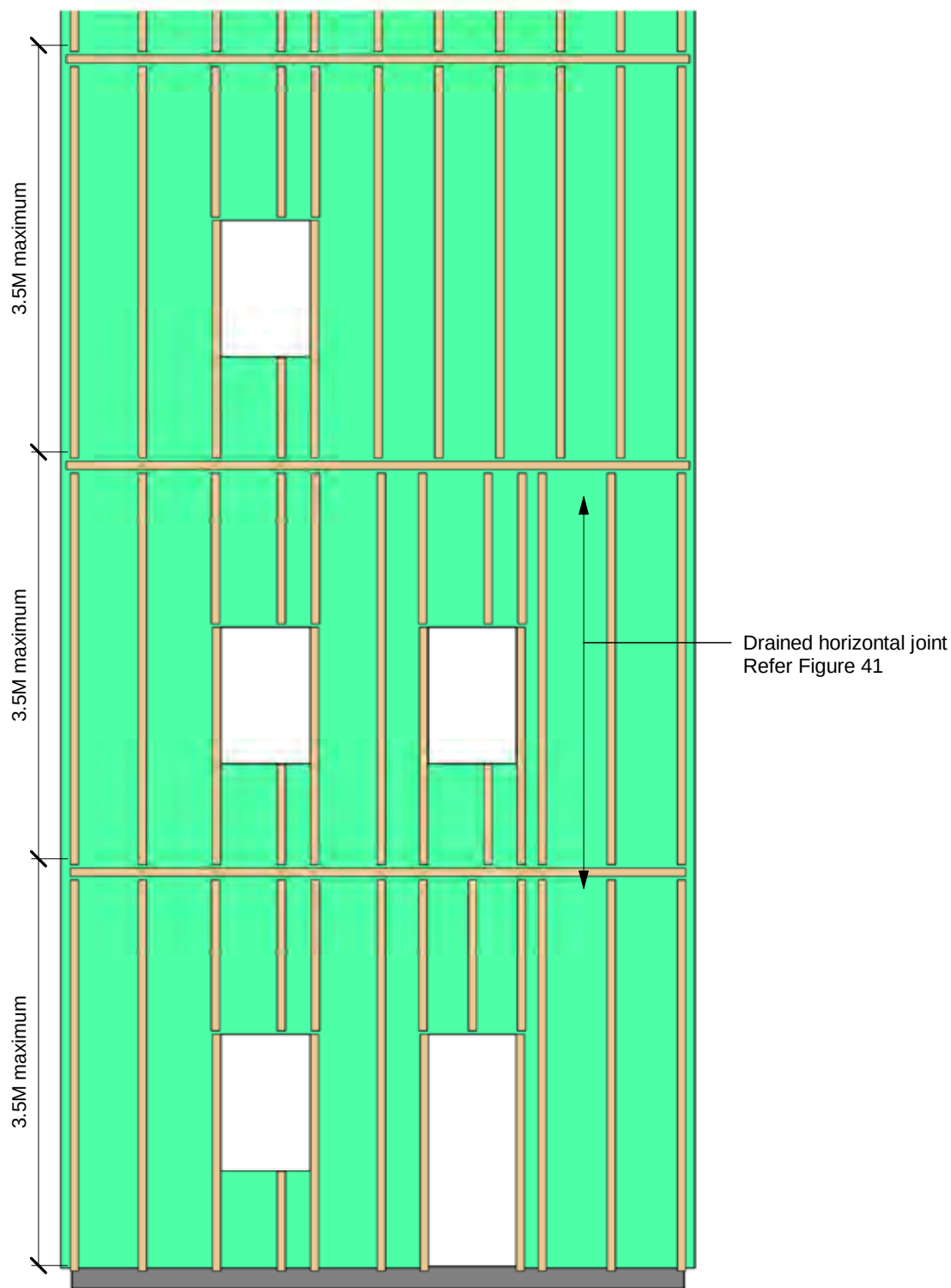
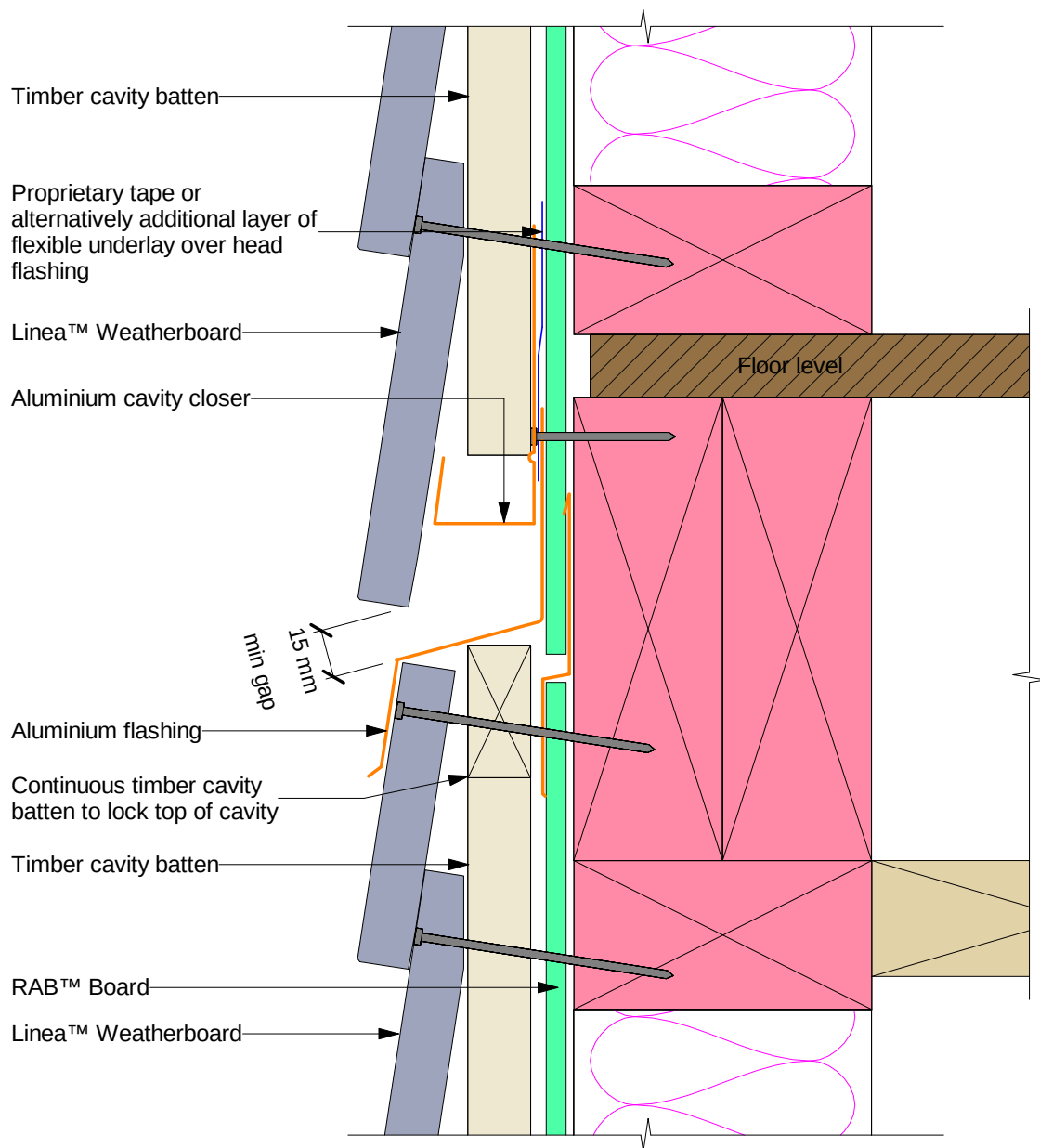


Figure 39: Intertenancy vertical fire separation



Notes

Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Weatherboard (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 Axent™ Trim and 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 ("The 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 Linea™ Weatherboard when installed in accordance with the appropriate Linea Weatherboard (cavity or direct fixed) technical specifications, 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.

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Linea™
WEATHERBOARD





BRANZ Appraised
Appraisal No. 1232 [2022]

OBLIQUE™ WEATHERBOARD [VERTICAL] CAVITY CLADDING

Appraisal No. 1232 [2022]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Oblique™ Weatherboard [Vertical] Cavity Cladding is a cavity-based fibre cement weatherboard wall cladding. It is designed to be used as an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 Oblique™ Weatherboard [Vertical] Cavity Cladding consists of Oblique™ rusticated profile fibre cement weatherboards fixed vertically over ventilated timber battens to form the cavity. The cladding is finished with a latex paint system.

Scope

- 2.1 Oblique™ Weatherboard [Vertical] Cavity Cladding installed over 40 mm structural cavity battens has been appraised as an external wall cladding for buildings between 0 and 10 m high within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Oblique™ Weatherboard [Vertical] Cavity Cladding installed over 20 mm timber cavity battens has also been appraised for weathertightness and structural wind loading when used as an external vertically fixed wall cladding for buildings between 0 and 25 m high within the following scope:
 - buildings with a building height not exceeding 25 m; and,
 - constructed with timber framing complying with the NZBC; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 3.2 kPa where studs are at maximum 400 mm centres; and,
 - with inter-storey deflections designed for and up to height/180 of horizontal in-plane movement during seismic serviceable limit state (SLS) events (based on a 3 m inter-storey height); and,
 - constructed with timber framing subject to specific engineering design; and,
 - when fixed over RAB™ Board by James Hardie New Zealand Limited.
- 2.3 Oblique™ Weatherboard [Vertical] Cavity Cladding must only be installed vertically on vertical, flat surfaces.
- 2.4 Oblique™ Weatherboard [Vertical] Cavity Cladding has been appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[Note: The Appraisal of Oblique™ Weatherboard [Vertical] Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.]*

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Oblique™ Weatherboard [Vertical] Cavity Cladding, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Oblique™ Weatherboard [Vertical] Cavity Cladding meets the requirements for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (h), (j) and (q)]. See Paragraphs 9.1-9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years, B2.3.1 (c) 5 years and B2.3.2. Oblique™ Weatherboard [Vertical] Cavity Cladding meets these requirements. See Paragraphs 10.1-10.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Oblique™ Weatherboard [Vertical] Cavity Cladding meets this requirement. See Paragraphs 14.1-14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Oblique™ Weatherboard [Vertical] Cavity Cladding meets this requirement.

Technical Specification

Oblique™ Weatherboards

- 4.1 Oblique™ Weatherboards are 14 mm thick rusticated profile weatherboards, available 200 or 300 mm wide and 2,750 or 4,200 mm long. They are factory sealed on all sides and pre-primed with a manila white acrylic primer on the front face.
- 4.2 Oblique™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a rusticated profile is machined on the top edge of the front face, and a rebated lap is machined on the bottom of the back face of the weatherboard. The front edge at the bottom of the board and the board ends are finished square. Oblique™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- 4.3 Accessories used with Oblique™ Weatherboard [Vertical] Cavity Cladding, which are supplied by James Hardie New Zealand Limited are:
- **Hardie™ 20 mm horizontal cavity battens** – 45 x 20 mm thick radiata pine battens treated to Hazard Class H3.1 and available in 2,700 mm lengths. The top edge is bevelled with an 18° slope. The back face is grooved with 22 mm wide x 5 mm deep rebates at 50 mm centres, and the front face is grooved with 6 mm wide x 6 mm deep rebates at 150 mm centres. The grooves are offset on each face.
 - **Hardie™ 40 mm structural horizontal cavity battens** – 45 x 40 mm thick radiata pine battens treated to Hazard Class H3.1 and available in 2,700 mm lengths. The top edge is bevelled with an 18° slope. The back face is grooved with 22 mm wide x 5 mm deep rebates at 50 mm centres, and the front face is grooved with 6 mm wide x 6 mm deep rebates at 150 mm centres. The grooves are offset on each face.
 - **Hardie™ Axent™ Trim** – a 19 mm thick fibre cement trim pre-primed with an acrylic primer, available 70 and 89 mm wide and in 3,000 mm lengths.
 - **Hardie™ 14 mm Trimline joint flashing** – an etch-primed aluminium extrusion used behind the cladding at vertical joints, available in 3,000 mm lengths.
 - **Weatherboard Internal 'W' Corner** – an aluminium extrusion used to create internal corners, available in 2,700 and 4,000 mm lengths.
 - **Hardie™ 14 mm internal corner flashing** – a 90° anodised aluminium extrusion available in 3,000 mm lengths.
 - **Hardie™ 14 mm external box corner** – an anodised aluminium extrusion used to create external corners, available in 2,700 and 4,000 mm lengths.
 - **uPVC vent strip** – a uPVC moulding used as vermin proofing, available in 3,000 mm lengths.

- **Trimline horizontal jointer** – an aluminium jointer used to cover the butt joint of Hardie™ 14 mm Trimline joint flashing, available in 100 mm lengths.
- **Trimline external corner jointer** – 55 x 55 mm aluminium extrusion which joins Trimline joint flashings at an external corner.
- **Trimline internal corner jointer** – 60 x 60 mm aluminium extrusion which joins Trimline joint flashings at an internal corner.
- **Oblique™ 14 mm Plug** – a PVC plug to fill the recess in the Oblique™ Weatherboards, available in bags of 200.
- **HomeRAB™ Pre-Cladding** – 4.5 mm thick fibre cement rigid wall underlay, 1,200 mm wide and available in 2,450 or 2,750 mm lengths.
- **RAB™ Board** – 6 or 9 mm thick fibre cement rigid wall underlay, 1,200 mm wide and available in 2,450, 2,750 or 3,000 mm lengths.

4.4 Accessories used with Oblique™ Weatherboard [Vertical] Cavity Cladding, which are supplied by the building contractor are:

- **Fixings for 20 mm timber cavity battens to timber frame** – 40 x 2.8 mm or longer Hardie™ Flex nail.
- **Fixings for Oblique™ Weatherboard to 20 mm cavity battens over flexible wall underlay** – 65 x 2.87 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails.
- **Fixings for Oblique™ Weatherboard to 20 mm cavity battens over rigid wall underlay** – 75 x 3.06 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails.
- **Fixings for Hardie™ 40 mm structural horizontal cavity battens to timber frame** – 75 x 3.06 mm 'D' round head stainless steel or hot-dip galvanised nail or 80 mm x 10 g wood screws.
- **Fixings for Oblique™ Weatherboard to Hardie™ 40 mm structural horizontal cavity battens** – 50 x 2.87 mm 'D' head or RounDrive ring shank stainless steel or hot-dip galvanised nails.

[Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680].

- **40 mm vent strip** – uPVC moulding used as vermin proofing.
- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible wall underlay support** – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible wall underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: Mesh and wire galvanising must comply with AS/NZS 4534.]*
- **Rigid wall underlay** – plywood or fibre cement panel complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal or CodeMark for use as a rigid air barrier system.
- **RAB™ Board vertical joint sealing tape** – Thermakraft™ Premium Joining Tape, Thermaflash® Self-Adhesive Window Flashing Tape, Super-Stick Building Tape® or 3M™ All Weather Flashing Tape 8067.
- **Flexible sill, head and jamb flashing tape** – flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Joinery head flashings** – extruded or folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Window and door trim cavity air seal** – air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** – sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.

Paint System Specification

- 4.5 Paint systems are not supplied by James Hardie New Zealand Limited and have not been assessed, therefore they are outside the scope of this Appraisal.
- 4.6 All exposed faces, including top edges at sills and all bottom edges of Oblique™ Weatherboard and accessories must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730 within 90 days of installation.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by James Hardie New Zealand Limited or the building contractor, whether on-site or off-site, is under the control of the building contractor. Oblique™ Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.
- 5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Oblique™ Weatherboard 14 mm Vertical Installation Technical Specification, October 2022.
 - Oblique™ Weatherboard 14 mm Vertical Installation to Hardie™ 40 mm structural cavity batten Technical Specification, October 2022.
- 6.2 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

Framing

Timber Treatment

- 7.1 Timber wall framing behind Oblique™ Weatherboard [Vertical] Cavity Cladding must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

- 7.2 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604.
- 7.3 Studs must be at maximum 600 mm centres. Nogs/dwangs must be in a continuous line and be fitted flush between the studs. When 200 mm wide Oblique™ Weatherboards are installed over 20 mm timber cavity battens, nogs/dwangs must be spaced at maximum 600 mm centres in NZS 3604 Wind Zones up to, and including, Extra High. When 300 mm wide Oblique™ Weatherboards are installed over 20 mm timber cavity battens, nogs/dwangs must be at 400 mm centres, or double fixings must be used if nogs/dwangs are at 600 mm centres, in areas subject to wind pressures above 1.5 kPa. When Oblique™ Weatherboards are installed over 40 mm structural cavity battens, nogs/dwangs must be spaced at maximum 400 mm centres when installed in areas subject to wind pressures over 1.5 kPa.
- 7.4 The moisture content of the timber framing must not exceed 24% at the time of the cladding installation. *[Note: If Oblique™ Weatherboard [Vertical] Cavity Cladding is fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.]*

General

- 8.1 When Oblique™ Weatherboard [Vertical] Cavity Cladding is used for specifically designed buildings up to 3.2 kPa ULS wind pressure, only the weathertightness and structural aspects of the cladding are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.
- 8.2 Punchings in the cavity vent strip and rebates in the cavity batten provide a minimum ventilation opening area of 1,000 mm² per lineal metre of wall. *[Note: Hardie™ horizontal cavity battens do not provide vermin proofing to the bottom of the cavity and an additional cavity vent strip must be used.]*
- 8.3 At ground level the bottom edge of Oblique™ weatherboards must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.
- 8.4 At balcony, deck or low pitch roof/wall junctions, the bottom edge of Oblique™ weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.
- 8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for Wind Zones up to, and including, Very High, and rigid underlays for buildings in the Extra High Wind Zone and specifically designed buildings up to 3.2 kPa design differential ULS wind pressure.
- 8.6 All external walls of buildings must have barriers to airflow in the form of 9 mm thick RAB™ Board when between 10-25 m high or situated in specific design wind pressures over a maximum design differential ULS of 1.5 kPa.
- 8.7 Unlined gables and walls must incorporate RAB™ Board, a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.
- 8.8 Where Oblique™ Weatherboard [Vertical] Cavity Cladding abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

- 8.9 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 m in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 b). For buildings more than 10 m high, a drained horizontal joint must be provided at each floor to accommodate the inter-storey deflections.

Structure

Mass

- 9.1 The mass of the 200 mm wide Oblique™ Weatherboard when installed on the wall is 20.6 kg/m² at equilibrium moisture content (EMC) and the mass of the 300 mm wide board is 19.7 kg/m² at EMC. Oblique™ Weatherboard [Vertical] Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

- 9.2 Oblique™ Weatherboard [Vertical] Cavity Cladding will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

- 9.3 Oblique™ Weatherboard [Vertical] Cavity Cladding, when installed over 40 mm structural cavity battens, is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa ULS wind pressure where buildings are specifically designed.
- 9.4 Oblique™ Weatherboard [Vertical] Cavity Cladding, when installed over 20 mm timber cavity battens, is suitable for use in buildings up to 25 m high, situated in specific design wind pressures up to a maximum design differential ULS of 3.2 kPa, where studs are at maximum 400 mm centres. The spacing of nogs/dwangs must be in accordance with Paragraph 7.3.

Inter-storey Deflections

- 9.5 Oblique™ Weatherboard [Vertical] Cavity Cladding, installed in conjunction with RAB™ Board, is suitable to resist inter-storey deflections. When installed in accordance with the Technical Literature, Oblique™ Weatherboard [Vertical] Cavity Cladding, in conjunction with RAB™ Board, is capable of withstanding SLS deflections up to height/180.

Durability

- 10.1 Oblique™ Weatherboard [Vertical] Cavity Cladding meets the performance requirements of NZBC Clause B2.3.1 [b] 15 years for the Oblique™ Weatherboards, flashings and cavity system, and the performance requirements of NZBC Clause B2.3.1 [c] 5 years for the exterior paint system.

Serviceable Life

- 10.2 Oblique™ Weatherboard [Vertical] Cavity Cladding installations are expected to have a serviceable life of at least 50 years provided the paint coating system is maintained in accordance with this Appraisal to ensure the Oblique™ Weatherboards and fixings remain dry in service. Oblique™ Weatherboards must be painted within 90 days of fixing.
- 10.3 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 m from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604, Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Oblique™ Weatherboard [Vertical] Cavity Cladding must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.
- 10.4 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmospheres into aggressive environments for fasteners. The fixing of Oblique™ Weatherboard [Vertical] Cavity Cladding in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

- 11.1 Regular maintenance is essential for Oblique™ Weatherboard [Vertical] Cavity Cladding installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.
- 11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the sealant or paint coating manufacturer's instructions.
- 11.3 Regular cleaning [at least annually] of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be recoated at approximately 7-15 yearly intervals in accordance with the paint manufacturer's instructions.

- 11.4 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding. *[Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Oblique™ Weatherboard [Vertical] Cavity Cladding.]*

Prevention of Fire Occurring

- 12.1 Oblique™ Weatherboards are considered a non-combustible material and need not be separated from heat sources such as fireplaces, heating appliances and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fireplaces, heating appliances and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Vertical Fire Spread - Buildings 10 m in height or less

- 13.1 When the system is used in buildings 10 m or less in height, NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10 m.

Vertical Fire Spread - Buildings greater than 10 m in height

- 13.2 Oblique™ Weatherboard [Vertical] Cavity Cladding can form part of an external wall cladding system designed to meet Vertical Fire Spread requirements. This has not been assessed by this Appraisal and is outside its scope. Specific Fire Engineering Design is required for each building over 10 m in height to ensure the Oblique™ Weatherboard [Vertical] Cavity Cladding and the External Wall Cladding System will meet the requirements of NZBC Acceptable Solution C/AS2, Section 5.8 or NZBC Verification Method C/VM2, Section 4.6. The following information is provided to support the Specific Engineering Design.
- 13.3 Oblique™ Weatherboard [Vertical] Cavity Cladding, as part of the James Hardie External Cladding System, has been tested to NFPA 285 and has passed the test criteria.
- 13.4 The components listed in Table 1 form a part of the James Hardie External Cladding System and have been tested and achieved the listed classifications.

Table 1: Components of the Oblique™ Weatherboard [Vertical] Cavity Cladding system

Component	Test Method	Result
Oblique™ Weatherboards	AS/NZS 3837:1998	Pass Type A
Hardie™ Axent™ Trim	AS/NZS 3837:1998	Pass Type A
Joinery and joint flashings and mouldings	Aluminium as defined in C/AS2 definitions	Non-combustible
Cavity vent strip	-	-
Oblique™ Plug	-	-
Flexible wall underlay	-	-
James Hardie Rigid Air Barrier [RAB™ Board]	AS/NZS 3837:1998	Pass Type A
Flexible sill, head and jamb flashing tape	-	-
Cavity batten	Component of NFPA 285 test	Pass
Cavity batten and Oblique™ fixings	Steel as defined in C/AS2 definitions	Non-combustible
Air seals and sealant	-	-

Horizontal Fire Spread

- 13.5 Oblique™ weatherboards have a peak heat release rate of less than 100 kW/m² and a total heat released of less than 25 MJ/m². Testing was carried out as per Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of NZBC Acceptable Solution C/AS2, achieving a Type A performance.

External Moisture

- 14.1 Oblique™ Weatherboard [Vertical] Cavity Cladding, when installed in accordance with this Appraisal and the Technical Literature, will prevent the penetration of moisture that could cause undue dampness or damage to building elements.
- 14.2 The cavity must be sealed off from the roof and subfloor space to meet code compliance with NZBC Clause E2.3.5.
- 14.3 Oblique™ Weatherboard [Vertical] Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.
- 14.4 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.
- 14.5 The use of Oblique™ Weatherboard [Vertical] Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc. to remain weather-resistant.

Internal Moisture

- 15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

- 15.2 Oblique™ Weatherboard [Vertical] Cavity Cladding is not a barrier to the passage of water vapour, and when installed in accordance with the Technical Literature and this Appraisal will not create or increase the risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirement

- 16.1 All design and building work must be carried out in accordance with the Oblique™ Weatherboard [Vertical] Cavity Cladding Technical Literature and this Appraisal by competent and experienced tradespersons conversant with Oblique™ Weatherboard [Vertical] Cavity Cladding. Where the work involves Restricted Building Work [RBW], this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

System Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

- 17.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Oblique™ Weatherboard [Vertical] Cavity Cladding system. Flexible wall underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Rigid wall underlays must be installed in accordance with the instructions of the manufacturer and the Technical Literature. Particular attention must be paid to the installation of the wall underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.
- 17.2 Where studs are at greater than 400 mm centres and a flexible wall underlay is being used, a building underlay support must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

RAB™ Board

- 17.3 RAB™ Board must be installed in accordance with the Technical Literature and BRANZ Appraisal No. 611 James Hardie Rigid Air Barriers.

Hardie™ Horizontal Cavity Battens

- 17.4 Hardie™ horizontal cavity battens must be installed over the wall underlay to the wall framing [nogs/dwangs] at maximum 600 mm centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the Oblique™ Weatherboards. The 20 mm cavity battens must be fixed by the cladding fixings through the timber battens to the timber framing. Oblique™ Weatherboards must be fixed vertically to Hardie™ 40 mm structural horizontal cavity battens using fixings as specified in the Technical Literature.

Oblique™ Weatherboard Installation

- 17.5 Oblique™ Weatherboards may be cut on-site by power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.
- 17.6 Oblique™ Weatherboards must be dry prior to installation. Before the weatherboards are installed, cut ends exposed to the exterior such as at aluminium box corners or internal corners must be sealed with an acrylic sealer to reduce the absorbency of the fibre cement.
- 17.7 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing and the cavity vent strip must be installed continuously around the bottom of the cavity.
- 17.8 Oblique™ Weatherboards must be installed starting at the corner of the wall being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50 mm. The weatherboards should be installed with the lap facing away from the prevailing winds.
- 17.9 Oblique™ Weatherboard laps are pre-determined by the machined joint detail.
- 17.10 Fixings for Oblique™ Weatherboard [Vertical] Cavity Cladding must be in accordance with Paragraph 10.3 and the Technical Literature. The 'D' head nails must be punched a maximum of 2 mm below the surface of the panel and be no closer than 12 mm to the end of the panel.

Aluminium Joinery Installation

- 17.11 Aluminium joinery and associated head and sill flashings must be installed by the building contractor in accordance with the Technical Literature. An 8 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

Finishing

- 17.12 All punched fixings must be filled. The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Oblique™ Weatherboards and trim must be clean and dry before commencing painting.

Inspections

- 17.13 The Technical Literature must be referred to during the inspection of Oblique™ Weatherboard [Vertical] Cavity Cladding installations.

Health and Safety

- 18.1 Cutting of Oblique™ Weatherboards must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.
- 18.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Technical Literature must be observed to minimise the amount of dust generated.
- 18.3 Safe use and handling procedures for Oblique™ Weatherboards and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

- 19.1 Uniform wind face load tests to simulate wind pressures on Oblique™ Weatherboards were carried out by a James Hardie Australia Pty Ltd NATA accredited laboratory. The testing determined design wind suction pressures, and by comparing these pressures with the NZS 3604 and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber-framed walls. The test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 19.2 Oblique™ Weatherboards have been tested by a James Hardie Australia Pty Ltd NATA accredited laboratory in accordance with AS/NZS 2908.2 and ISO 8336. The testing covered: soak-dry, bending strength, warm water soaking, heat/rain, freeze/thaw and apparent density. The test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 19.3 Cone calorimeter testing to determine the peak rate of heat release and total heat release of Oblique™ Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.
- 19.4 BRANZ expert opinion on NZBC C3 code compliance for Oblique™ Weatherboard [Vertical] Cavity Cladding was based on NFPA 285 testing by Intertek Group plc on specimens assembled comprising the James Hardie External Cladding System.
- 19.5 BRANZ expert opinion on NZBC E2 code compliance for Oblique™ Weatherboard [Vertical] Cavity Cladding was based on NZBC E2/VM2 [BRANZ EM7] testing and evaluation of all details within the scope and as stated within this Appraisal.

Other Investigations

- 20.1 Weathertightness, structural, fire and durability opinions have been provided by BRANZ technical experts.
- 20.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.3 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of Oblique™ Weatherboard has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of CodeMark Certificate GM-CM30059 RevE covering quality aspects with the cladding.
- 21.2 The quality of materials, components and accessories supplied by James Hardie New Zealand Limited is the responsibility of James Hardie New Zealand Limited.
- 21.3 Quality on-site is the responsibility of the installer.
- 21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the Oblique™ Weatherboard [Vertical] Cavity Cladding in accordance with the instructions of James Hardie New Zealand Limited.
- 21.5 Building owners are responsible for the maintenance of Oblique™ Weatherboard [Vertical] Cavity Cladding in accordance with the instructions of James Hardie New Zealand Limited.

Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2908.2:2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534:1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680:2006 Hot-dip galvanized [zinc] coatings on fabricated ferrous articles.
- BRANZ Appraisal No. 611 James Hardie Rigid Air Barriers.
- BRANZ EM7 Performance of mid-rise cladding systems.
- ISO 5660.1:2002 Heat release rate [cone calorimeter method].
- ISO 8336:2009 Fibre-cement flat sheets - Product specification and test methods.
- NFPA 285:2012 Standard method of test for the evaluation of flammability characteristics of exterior non-loadbearing wall assemblies containing components using the intermediate scale, multi-storey test apparatus.
- NZS 3603:1993 Timber Structures Standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4211:2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



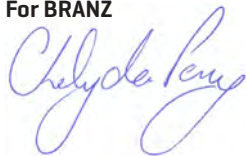
In the opinion of BRANZ, **Oblique™ Weatherboard [Vertical] Cavity Cladding** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **James Hardie New Zealand Limited**, 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. **James Hardie New Zealand Limited:**
 - 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 **James Hardie New Zealand Limited**.
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 **James Hardie New Zealand Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

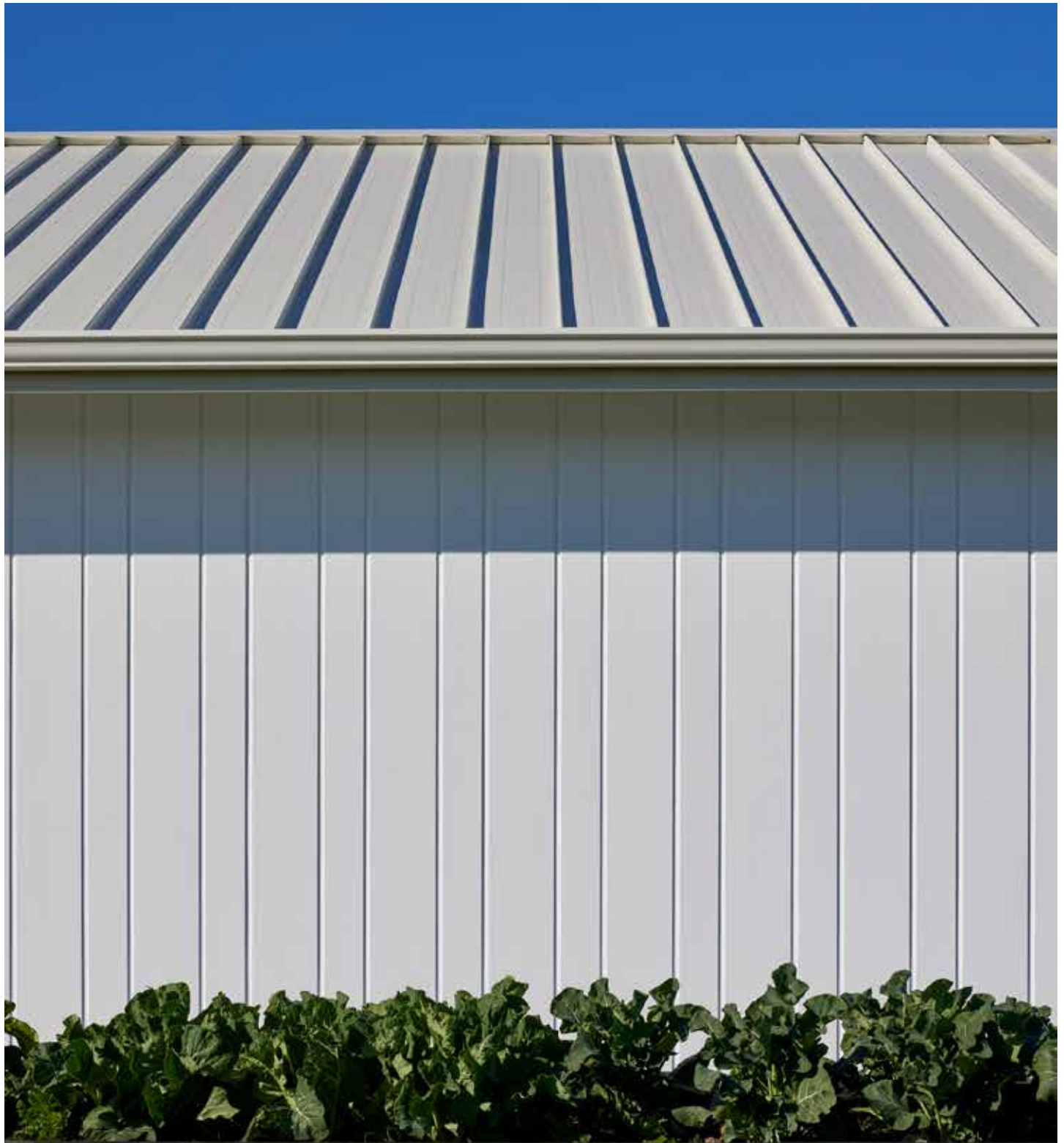
26 October 2022

Oblique™ Weatherboard 14mm Vertical Installation

Technical Specification

October 2022 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.**

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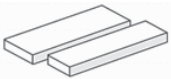
1 Product Overview

1.1 Production Information

Oblique™ Weatherboard installed as per this specification gives a vertical rusticated profile weatherboard appearance. Oblique™ Weatherboard can be fixed to timber-framed external walls.

A wide range of colours can be used varying from light to dark. Oblique™ Weatherboard is available in 200mm or 300mm wide x 4200mm or 2750mm lengths and is 14mm thick.

Table 1

Oblique™ Weatherboard information					
Product	Description	Size (mm)			Code
		Thickness	Length	Width	
	Oblique™ Weatherboard A 14mm profiled weatherboard for residential cladding. Factory sealed on all six sides. Each weatherboard has a manila white colour primer applied on its face, which accepts a wide range of paint finishes.	14	2750	200 300	405322 405323
			4200	200 300	405320 405321
	Hardie™ Axent™ Trim Hardie™ Axent™ Trim is a 19mm thick, pre-primed fibre cement product available in two widths. For use as decorative trims around openings and external corners.	19	3000	70 89	405257 405258

Note: All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Oblique™ Weatherboard is manufactured in 14mm thickness and has a mass of 16kg/m . Oblique™ Weatherboard is defined as a Light Weight Wall Cladding (not exceeding 30kg/m²) as per NZS 3604.

1.2 Manufacturing and Classification

Oblique™ Weatherboard is an advanced lightweight cement composite cladding, manufactured using James Hardie formulation. Basic composition is Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Oblique™ Weatherboard'.

Hardie™ Axent™ Trim is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Hardie Axent' printed on the back.

Oblique™ Weatherboard and Hardie™ Axent™ Trim products are manufactured in Australia to Australian/New Zealand Standard AS/NZS 2908.2 'Cellulose-Cement Products' (ISO 8336 'Fibre-Cement Flat Sheet').

Oblique™ Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 "Cellulose-Cement Products".

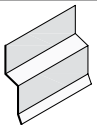
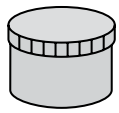
For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or **Ask James Hardie™** on **0800 808 868**.

1.3 Components and Accessories

Table 2

Accessories/tools supplied by James Hardie			
Accessories	Description	Size	Code
	Hardie™ Horizontal Cavity Batten 20mm H3.1 Timber treated batten the cladding is fixed over	2700mm long	305862
	Hardie™ 14mm Aluminium Trimline Joint Flashing Aluminium extrusion used behind cladding at horizontal joints.	3000mm long	305827
	Weatherboard Internal 'W' Corner Anodised aluminium extrusion used to create internal corners.	2700mm long 4000mm long	300386 306180
	Hardie™ 14mm Aluminium Internal Corner Anodised aluminium extrusion used to create internal corners.	3000mm long	304871
	Hardie™ 14mm Aluminium Weatherboard External Box Corner Anodised aluminium extrusion used to create external corners.	2750mm long 4000mm long	306160 305823
	uPVC Vent Strip PVC moulding used as vermin proofing.	3000mm long	302490
	Trimline Horizontal Jointer A jointer to cover the butt joint of Oblique™ Trimline Joint Flashing	100mm long	305871
	Trimline External Corner Jointer Joins Trimline Joint Flashing at an external corner		305870
	Trimline Internal Corner Jointer Joins Trimline Joint Flashing at an internal corner		305872
	Oblique™ 14mm Plug To fill recess in Oblique™ Weatherboard 14mm		306154
Tools			
	Hardie™ Blade Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included.	184mm 254mm	300660 303375

Table 3

Accessories/tools not supplied by James Hardie	
James Hardie recommends the following products for use in conjunction with Oblique™ Weatherboard and HomeRAB™ Pre-Cladding/RAB™ Board. James Hardie does not supply these products and does not provide a warranty for their use. Please contact component manufacturer for information on their warranties and further information on their products.	
Product	Description
	Flexible underlay Must comply with Table 23 of E2/AS1.
	Flexible window opening flashing tape A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this manual for more information. e.g. Protecto® or Super-Stick Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787
	Rigid air barrier vertical joint sealing tape The tape to be used to seal HomeRAB™ Pre-Cladding/RAB™ Board vertical joints. Thermakraft™ Premium Joining Tape, Thermaflash® Self Adhesive Window Flashing tape by Thermakraft™ Ltd or Super-Stick Building Tape® by Marshall Innovations or 3M™ All Weather Flashing Tape 8067 by 3M™ Marshall Innovations: 0800 776 9727 3M™: 0800 474 787 Thermakraft™ Ltd 0800 806 595
	Flexible Sealant Bostik® Seal N Flex-1™, Sikaflex® AT Facade, Sikaflex® MS or similar.
	65 x 2.87mm 'D' head nail or 65 x 2.87 RoundDrive nail (ring shank hot dipped galvanised/stainless steel) For fixing Oblique™ Weatherboard.
	75 x 3.06mm 'D' head nail or 75 x 3.15 RoundDrive nail (hot dipped galvanised or ring shank stainless steel) For fixing Oblique™ Weatherboard.
	40 x 2.8mm or longer Hardie™ Flex nail. For fixing timber cavity battens and aluminium flashings.
	Meter box Refer electrical suppliers.
	Head flashing Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.
	Exterior grade filler CRC® ADOS® Builders Fill or similar two part filler to fill over nail holes

2 Application and Scope

2.1 Application

Oblique™ Weatherboard can be installed vertically to timber frame or steel frame.

For fixing to steel frame, Ask James Hardie™ on 0800 808 868 for specific requirements. You can also refer to Steel Frame Technical Supplement by James Hardie for more information.

Specifiers

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.

Installers

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this Technical Specification. All of the details provided in this document must be read in conjunction with the project specification.

2.2 Scope

This specification covers the installation of Oblique™ Weatherboard within the following scope:

- The Oblique™ Weatherboard must be installed vertically.
- An external wall structure that complies with the NZBC for an existing building or new building where the designer and/or installer has established that the external wall frame is suitable for the cladding installation.
- In all wind zones up to a design wind pressure of 3.2kPa (ULS) up to 25m of building height. In wind zones greater than Very High (VH), a rigid air barrier must be used.

Refer to Oblique™ Weatherboard Horizontal Installation technical specification when installing horizontally.

2.3 Details

Various typical Oblique™ Weatherboard vertical construction details are provided in the Details section of this document. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded from our website at www.jameshardie.co.nz.

All dimensions shown are in millimetres unless noted otherwise.

2.4 Specific Design

For use of Oblique™ Weatherboard in a specific engineering design (SED) project that is outside the scope of this literature, the designer, architect or engineer must ensure that applicable clauses of the NZBC have been considered and a specific design has been undertaken.

3 Compliance

3.1 Compliance

Oblique™ Weatherboard installed in accordance with this specification has been tested to demonstrate compliance with clauses E2, B1, B2 and F2 of the NZBC.

When installed in accordance with the conditions of CodeMark number GM-CM30147 Oblique™ Weatherboard complies with all relevant requirements of the NZBC. Please refer to www.building.govt.nz or www.jameshardie.co.nz for a copy of the certificate.



Oblique™ Weatherboard Vertical Installation has a BRANZ Appraisal number 1232 (2022) to demonstrate compliance with the requirements of the NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the BRANZ appraisal.

4 Design

4.1 Responsibility

The specifier or other party responsible for the project must ensure that the information and details 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 technical specification. For applications outside the scope of this literature and details, which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All New Zealand Standards referenced in this document are current editions and must be complied with.

Make sure your information is up to date

When specifying or installing products by James Hardie, 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.

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.

4.2 Site and Foundation

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'. Foundation 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 the NZBC requirements.

4.3 Clearances

The clearance between the bottom edge of the 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.

Oblique™ Weatherboard must overhang the bottom plate by a minimum of 50mm, as required by E2/AS1.

Oblique™ Weatherboard must maintain 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 6 and 7.

4.4 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 interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration. The building should also be ventilated sufficiently to control moisture accumulation due to condensation, especially in artificially cooled/heated buildings.

Walls must include those provisions as required by the NZBC Acceptable Solution Clause E2/AS1. 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 guidance 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.

In addition, the following issues must also be considered:

- Sealant must be installed where detailed in this literature
- Where the walls are higher than two storeys, it is necessary to provide a horizontal flashing at the second floor level to drain the cavity
- The installation of smoke chimneys, pipe penetrations and other fixtures etc. must not track moisture into the wall or restrict the drainage of moisture to the exterior

4.5 Structure

4.5.1 Timber Framing

Timber-framed buildings must either be in accordance with NZS 3604 (Timber-framed Buildings) or designed as per specific engineering design (SED).

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 generated by loadings etc.

4.5.2 Dimensions

A 90 x 45mm minimum framing size is required.

4.5.3 Structural Grade

Timber grade used must be in accordance with timber grades specified in NZS 3604.

4.5.4 Durability

The external framing timber must be treated to a minimum H1.2 treatment. Higher treatment levels may be used, but check for the compatibility of treatment chemicals with other materials. 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 the framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at the site in accordance with the framing manufacturer's recommendations.

4.6 Wind Pressures

Oblique™ Weatherboard is suitable for use in wind zones up to and including EH as defined in NZS 3604.

Oblique™ Weatherboard is also suitable for use in specific design projects up to wind pressures of 3.2kPa (ULS).

4.7 Structural Bracing

Oblique™ Weatherboard installed as per this specification cannot be used to achieve structural bracing. However, bracing can be achieved by using a HomeRAB™ Pre-Cladding/RAB™ Board installed direct to framing instead of a flexible underlay or by using the Villaboard™ Lining bracing system on the internal face of the wall. Refer to the Bracing Design Manual by James Hardie for further information.

4.8 Energy Efficiency

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

4.9 Fire Rated Walls

Oblique™ Weatherboard when fixed over timber cavity battens to external walls can achieve fire ratings up to 60/60/60 to comply with Clause C/AS1 and C/AS2 of the NZBC, when the walls are constructed in accordance with the current Fire and Acoustic Design Manual by James Hardie.

Oblique™ Weatherboard is classified as a 'non-combustible' material suitable for use on walls close to a boundary.

4.10 Control of External Fire Spread

Oblique™ Weatherboard material is classified as 'Type-A' as per Table C1.3 when tested to the requirements of Appendix C7.1.1 (b) of C/AS2 of NZBC and is suitable for use where 'Non Combustible Material' or 'Limited Combustibility Material' is required for use in buildings located anywhere in relation to the relevant boundary for building within the scope of C/AS1 or C/AS2.

- At intervals of no greater than 3.5m vertical height where the upper floors contain sleeping uses or other property, a horizontal flashed joint must be provided to block the top of lower cavity. Refer to Figure 39.
- On buildings greater than 10m in height a RAB™ Board must be used.

4.11 Durability

Oblique™ Weatherboard and HomeRAB™ Pre-Cladding/RAB™ Board installed and maintained as per this technical specification will meet the durability requirement for cladding as per the NZBC clause B2 Durability.

Oblique™ Weatherboard is resistant to permanent moisture induced deterioration (rotting) and meets the requirements of the following tests in accordance with the 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)

4.12 Alpine Regions

In regions subject to freeze/thaw conditions, Oblique™ Weatherboard and HomeRAB™ Pre-Cladding/RAB™ Board 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 snowdrifts over winter are expected.

These products meet the requirements of the AS/NZS 2908.2 Clause 8.2.3.

5 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/NZS1716 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 and when cleaning up
- 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.

When cutting

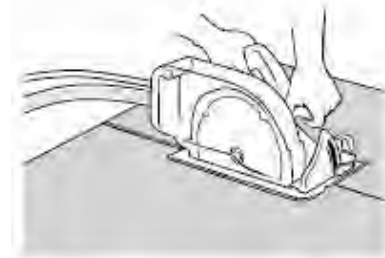
- ✓ Work outdoors only
- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Rotate employees across cutting task over duration of shift
- ✓ Cut products with a Hardie™ Blade Saw Blade (or equivalent) 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 (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
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

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

5.1 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.

5.2 Tips for Safe and Easy Handling of Oblique™ Weatherboard

- ✗ Do not lift planked products flat and in the middle
- ✓ Carry the products on the edge
- ✓ If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- ✓ If two people are carrying the plank, hold it near each end and on edge
- ✓ Exercise care when handling weatherboard products to avoid damaging the edges/corners

6 Installation

Oblique™ Weatherboard must be installed vertically using the cavity construction method as per the details and information published in this manual.

The two widths of Oblique™ Weatherboard can be mixed to create the desired look.

Oblique™ Weatherboard must be kept under cover whilst in storage or at sites and they must be dry at the time of their installation. All site-cut board edges must be sealed with Dulux® Acraprime® 501/1, Dulux® 1 Step, Resene® Quick Dry or a similar sealer compatible with the finish coat before installation.

Oblique™ Weatherboard must be fully supported and fixed through Hardie™ horizontal cavity battens. Ensure that cladding is hard against the battens to avoid drumminess.

This technical specification only covers the vertical installation of Oblique™ Weatherboard. Refer to the Oblique™ Weatherboard horizontal installation technical specification for horizontal installation.

6.1 Fastener

6.1.1 Fastener – Size and Layout

Oblique™ Weatherboard must be fixed vertically to framing using fixings as specified in Tables 4 and 5 on the next page and follow the edge distance required for nails as shown in the details.

Table 4

Oblique™ Weatherboard 200mm			
Cavity Construction	Wind Zone	Fixing	Fastener Type
Over flexible underlay	Up to and including VH wind zone	Fix one nail 100mm from bottom edge of board per nog/plate. Refer to Figure 4	65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails or 75 x 3.15mm Hardie™ Flex nails
Over HomeRAB™ Pre-Cladding	Up to and including VH wind zone	Fix one nail 100mm from bottom edge of board per nog/plate. Refer to Figure 4	75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails or 75 x 3.15mm Hardie™ Flex nails
Over RAB™ Board	Up to and including EH wind zone and SED projects	Fix one nail 100mm from bottom edge of board per nog/plate. Refer to Figure 4	75 x 3.06mm D head nails or 75 x 3.15mm RounDrive ring shank nails

- The loose 75 x 3.15mm Hardie™ Flex nail is only suitable for use up to VH wind zone

Table 5

Oblique™ Weatherboard 300mm			
Cavity Construction	Wind Zone	Fixing	Fastener Type
Over flexible underlay	Up to and including VH wind zone	Fix one nail 150mm from bottom edge of board per nog/plate. Refer to Figure 4	65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails
Over HomeRAB™ Pre-Cladding	Up to and including VH wind zone	Fix one nail 150mm from bottom edge of board per nog/plate. Refer to Figure 4	75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails
Over RAB™ Board	Up to and including EH wind zone and SED projects with nogs at 400mm centres maximum	Fix one nail 150mm from bottom edge of board per nog/plate. Refer to Figure 4	75 x 3.06mm D head nails or 75 x 3.15mm RounDrive ring shank nails
Over RAB™ Board	Up to and including EH wind zone and SED projects with nogs at 600mm centres maximum	Fix two nails 80mm from bottom and top edge of board per nog/plate. Refer to Figure 5	75 x 3.06mm D head nails or 75 x 3.15mm RounDrive ring shank nails

For other fixing options Ask James Hardie™ on 0800 808 868.

- When fixing the weatherboards using nail guns, refer to the nail gun manufacturer for information about nails and the type of nail gun to be used
- D head nails - finish nails 2mm below weatherboard surface
- RounDrive nails - finish nails flush with weatherboard surface
- Hardie™ Flex nails - finish nails flush with weatherboard surface

6.1.2 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing materials to be used in relation to exposure conditions and are summarised in Table 6.

Fasteners must be fully compatible with the other materials that they are to be in contact with, to ensure the durability of the complete assembly.

Table 6

Exposure conditions and nail selection prescribed by NZS 3604		
Zone	Application	
D (sea spray) and geothermal hot spots	General	Stainless steel 304/316
	Fire	
*C and B	General	Hot dip galvanised**
	Fire	

* Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made Microclimatic 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.

6.2 Framing

Oblique™ Weatherboard can be fixed either to a timber-frame or steel-frame.

For fixing to a steel frame Ask James Hardie™ on 0800 808 868 for specific requirements.

6.2.1 Special Framing Requirements

The following are special framing requirements for both timber and steel framing:

- Double studs are required at internal corners, refer to Figures 10 and 11
- Extra packers may be required at external corners

6.2.2 Tolerances

In order to achieve the required performance and an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with Table 2.1 of NZS 3604 and the manufacturer's specifications. All framing shall be made flush. Also refer to MBIE guidance to tolerances, materials and workmanships etc.

6.2.3 Frame Construction

Use of timber framing must be in accordance with NZS 3604 and the framing manufacturer's specifications. The framing must be rigid and must not rely on the cladding for stability. Timber framing sizes and its set-out must comply with NZS 3604 and as specified in this technical specification.

The following framing is required for Oblique™ vertical Installation:

- Studs must be provided at 600mm centres maximum
- Nogs must be provided at 600mm centres maximum
- An extra stud is required in internal corners
- For specific design projects exposed to wind speeds higher than 55m/sec, the stud size and spacing must be as per the project specific engineering design requirements
- The nog spacing must be closed to 400mm centres for EH and SED wind zones.

In case of gable end trusses sitting on top plates of the 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.

6.3 Flexible Underlay/HomeRAB™ Pre-Cladding

Flexible underlay/HomeRAB™ Pre-Cladding must be provided as per the requirements of External Moisture Clause E2 of the NZBC. The flexible underlay selected for use must comply with Table 23 of E2/AS1.

The flexible underlay must be fixed in accordance with section 9.1.7 of E2/AS1 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 Table 23 of E2/AS1. For attached garages, flexible underlays must be selected in accordance with the NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. HomeRAB™ Pre-Cladding by James Hardie complies with these requirements and is suitable for use in this situation. It must be installed in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

6.4 Intermediate Support

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following options:

- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut

No intermediate supports are required:

- When studs are spaced at 400mm centres; or
- When rigid air barriers are used

6.5 Rigid Air Barrier

In EH wind zone or for specific design wind zone, a rigid air barrier i.e. RAB™ Board, must be used instead of flexible underlay.

For buildings more than 10m, RAB™ Board must be used. To achieve the temporary weathertightness using HomeRAB™ Pre-Cladding and RAB™ Board, windows/doors need to be installed with required flashing tapes and seals etc. Refer to HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual for information regarding its installation and to achieve temporary weathertightness.

6.6 Flashings

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to Oblique™ Weatherboard installation. Refer to moisture management requirements in Clause 2.5. The flexible underlay/rigid air barrier must be appropriately incorporated with penetration and junction flashings using flashing tapes. Materials must be lapped in such a way that water tracks down to the exterior on the face of the flexible underlay or rigid air barrier board.

The selected flashing materials must comply with the durability requirements of the NZBC. For information refer to Table 20 of E2/AS1.

When using HomeRAB™ Pre-Cladding/RAB™ Board the entire framing around openings must be protected with a flashing tape. The tape must be finished over the face of the rigid air barrier. Ensure to check the compatibility of flashing tapes and sealants with their manufacturers. Refer to the HomeRAB™ Pre-Cladding/RAB™ Board Installation Manual by James Hardie for further information.

6.7 Cavity Closure/Vent Strip

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

6.8 Cavity Battens

Oblique™ Weatherboard must be installed on a cavity. The battens provide ventilation and drainage between the frame and the weatherboard and are considered a “packer” only in this specification.

The Hardie™ horizontal cavity battens are H3.1 treated in accordance with NZS 3640 (Chemical preservation of rough and sawn timber) to comply with the durability requirements of B2/AS1.

Hardie™ horizontal cavity battens meet the requirements of E2/AS1 and:

- Are minimum 20mm thick and 45mm wide
- Fixed horizontally to nogs
- Fixed vertically to studs at corners and openings
- Must be fixed by the cladding fixings to the main framing over the flexible underlay. Therefore until claddings are fixed the battens only need to be tacked to framing by 40 x 2.8mm or longer nails at 800mm centres
- Permit air circulation and water drainage

6.9 Joints

6.9.1 Vertical Joint

Oblique™ Weatherboard vertical joints shall be formed using the ship lap edge of the Oblique™ Weatherboard. Ensure that the Oblique™ Weatherboards are securely interlocked before nailing, refer to Figures 3 to 5.

6.9.2 Horizontal Joint

Oblique™ Weatherboard can run continuously over floor joists without a flashed horizontal joint when LVL timber floor joists or engineered joist are used, refer to Figure 26.

When using a solid timber joist, a horizontal joint or a movement joint must be formed at floor joist, refer to Figure 25.

6.9.3 Drainage Joint

After every two floors a horizontal drainage joint flashing is required, refer to Figure 27.

For buildings higher than 3 storey, from a vertical fire spread safety perspective, a horizontal drainage joint is required at each floor.

6.9.4 External Corner

An external box corner flashing is used to fix the external corners, refer to Figure 8. Alternatively an Hardie™ Axent™ Trim external boxed corner can also be formed, refer to Figure 9.

6.9.5 Internal Corner

An internal corner flashing is to be used to form an internal corner joint, refer to Figures 10 and 11.

An extra stud is required in internal corners.

Note: All joint mouldings to be fixed at 400mm centres both sides.

6.10 Junctions and Penetrations

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. For an example of window details for Oblique™ Weatherboard which meet the performance requirements of E2 External Moisture, an approved document of the NZBC, refer to Figures 16 to 23.

7 Finishes

7.1 Preparation

The D head nail must be finished 2mm below the weatherboard surface. The nail holes must be filled with an exterior grade two part builders fill, ie. CRC® ADOS® Builders Fill or similar two part external grade filler. The RounDrive nail heads must finish flush with weatherboard surface.

7.2 Painting

Oblique™ Weatherboard is pre-primed and is suitable for site applied acrylic paints.

In order to seal cut edges or sanded patches, Dulux® 1 Step, Acraprime® 501/1, Resene® Quick Dry, Taubmans® Underproof Acrylic Primer Undercoat or a similar product should be applied. The primer should be compatible with the paint to be used.

Painting of Oblique™ Weatherboard is mandatory to meet the durability requirements of the NZBC and the 25 year James Hardie product warranty. Oblique™ Weatherboard must be dry and free of any dust or grime before painting. The weatherboards must be painted within 90 days of their installation. There is no restriction on the LRV of paint to be applied on the Oblique™ Weatherboard.

James Hardie recommends a minimum of two coats of exterior grade acrylic paint. Follow the paint manufacturer's recommendations to prepare the surface and to adequately cover and conceal the weatherboard fixings.

For best aesthetic results a low sheen paint is recommended.

7.3 Flexible Sealant

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

8 Care and Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to maintain the effectiveness of the cladding. The extent and nature of maintenance required will depend on the geographical location and exposure of the building.

As a guide, it is recommended that the 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. Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.
- Re-coating exterior protective finishes. Always refer to your paint manufacturer for re-coating requirements.
- Regular inspection and repair if necessary of the cladding joints, sealants, nail head fillers
- Cleaning out gutters, down pipes and overflow pipes as required
- Pruning back vegetation which is close to or touching the Oblique™ Weatherboard as well as ensuring the NZBC ground clearance requirements are maintained, especially where gardens are concerned
- The clearance between the bottom edge of the Oblique™ Weatherboard and the finished/unfinished ground must always be maintained

9 Details

The following generic details have been provided in this document for cavity construction methods.

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Figure 1: Cladding installed

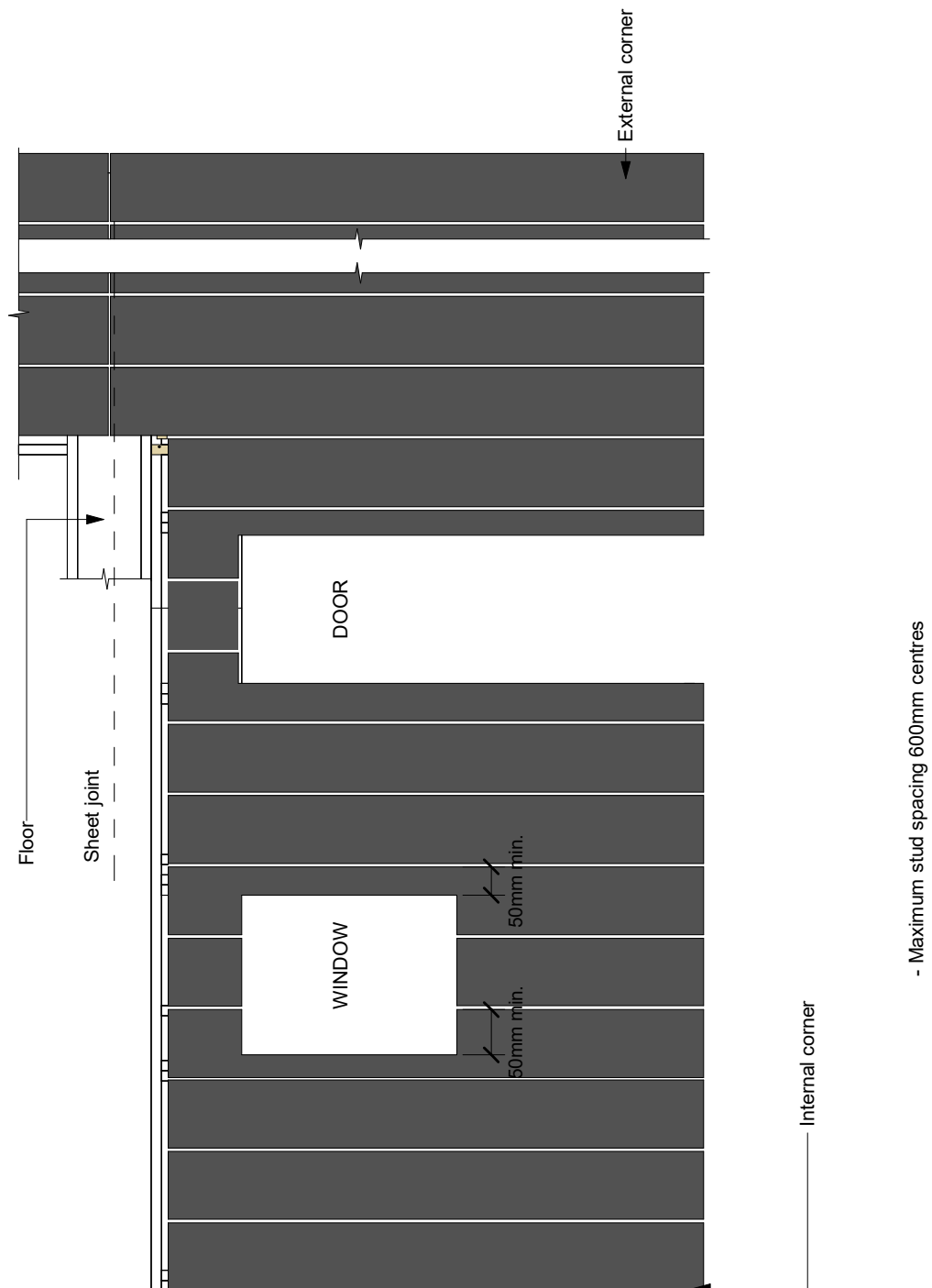


Figure 2: Framing setout

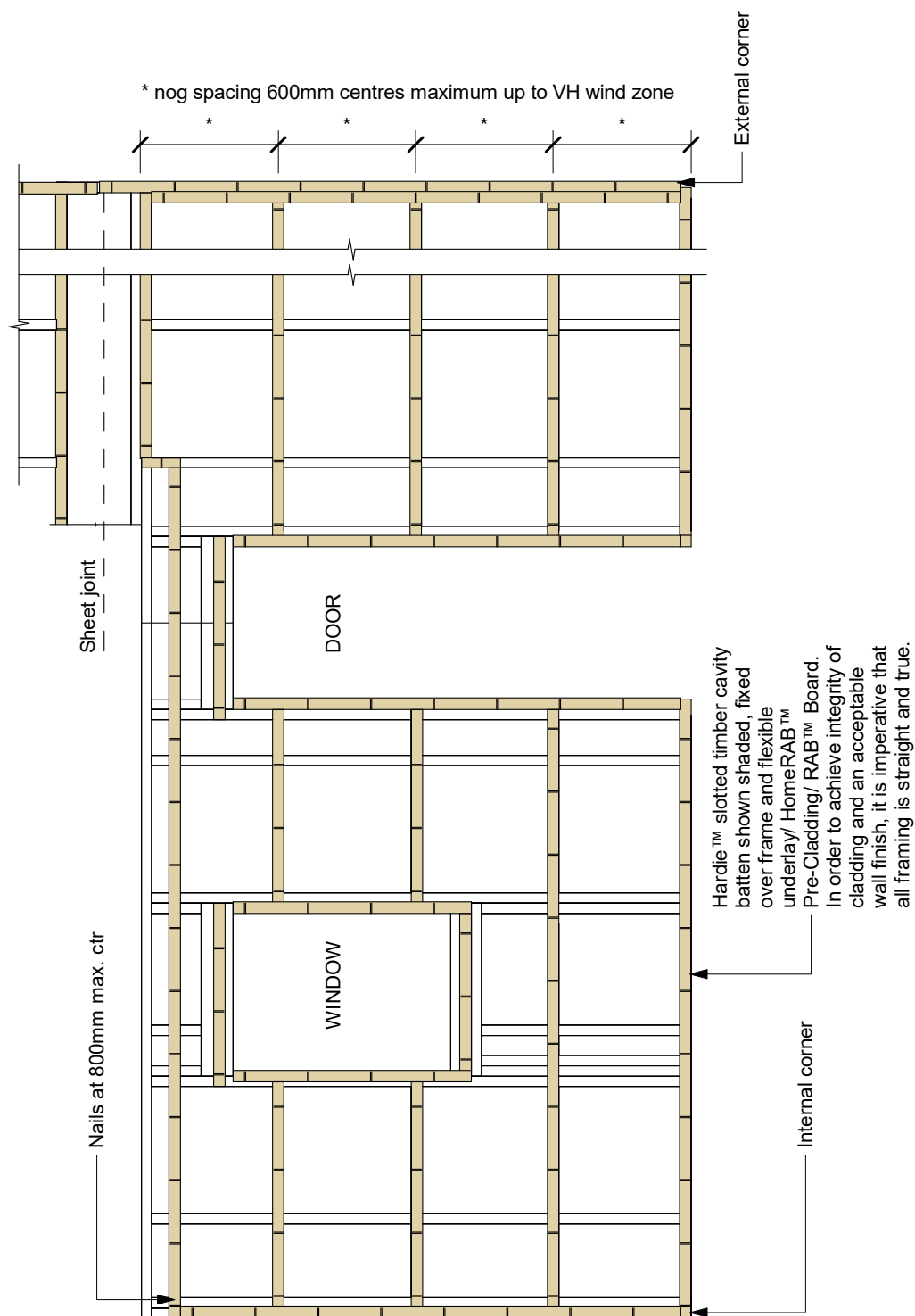


Figure 3: Cladding & Hardie™ horizontal cavity batten

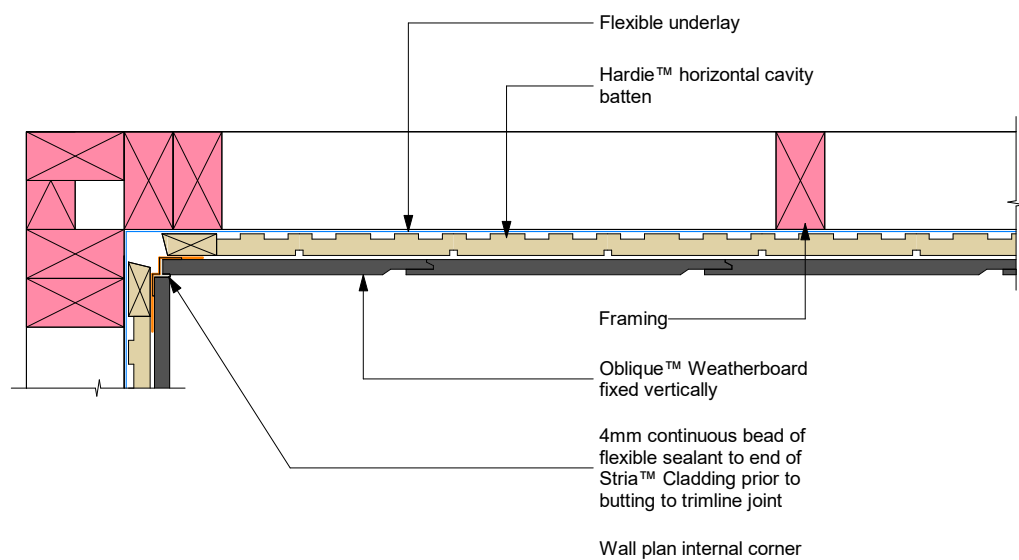
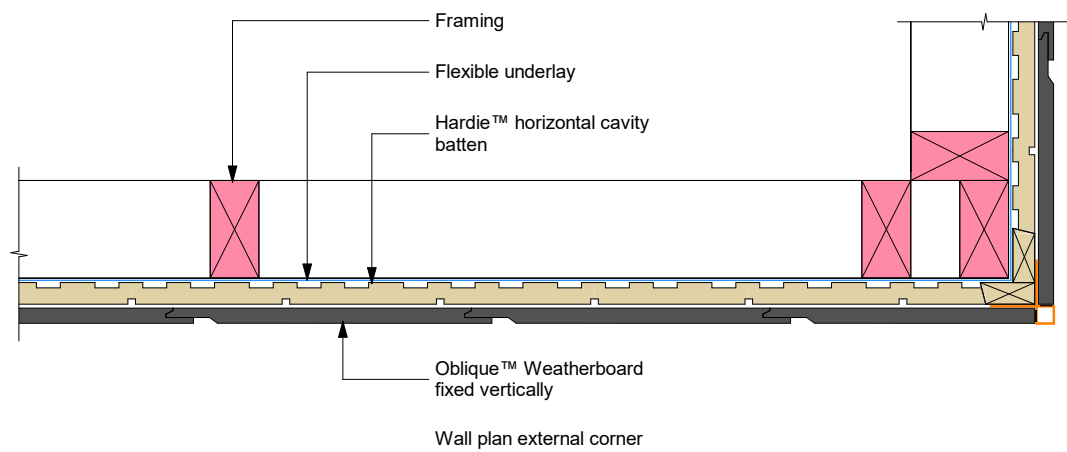


Figure 4: Fixing up to VH wind zone

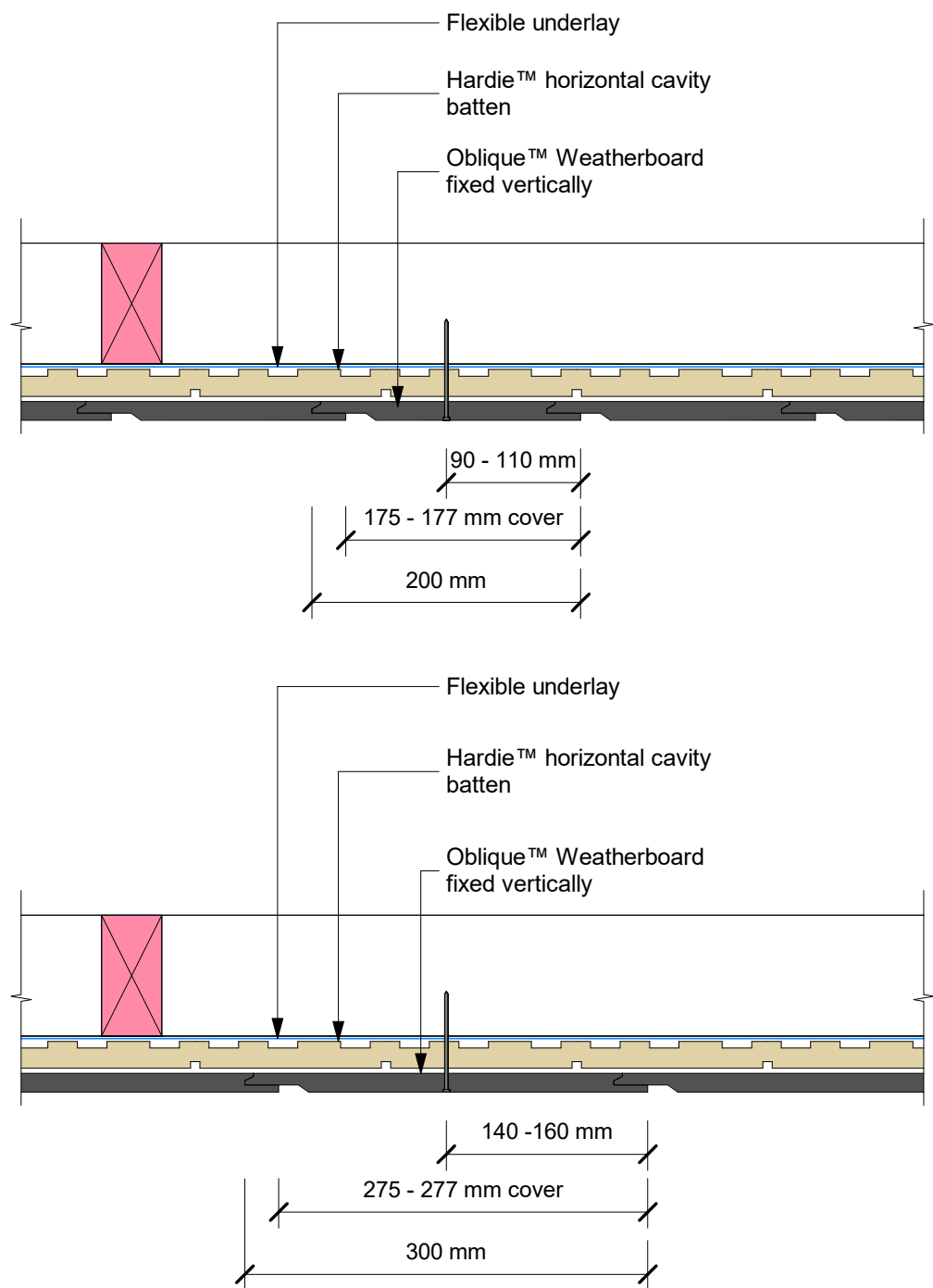


Figure 5: Fixing in EH or SED wind zone

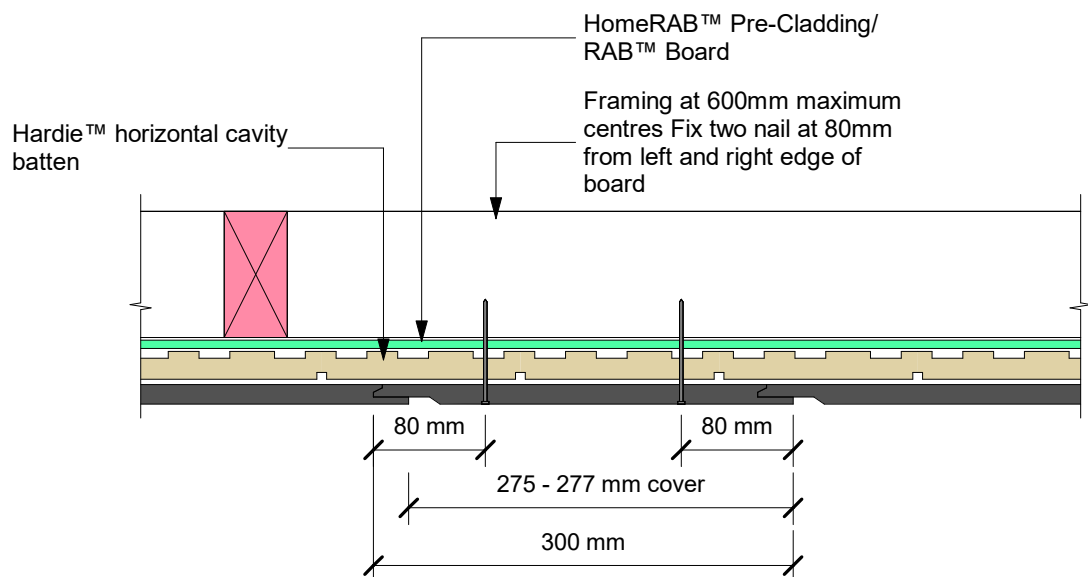
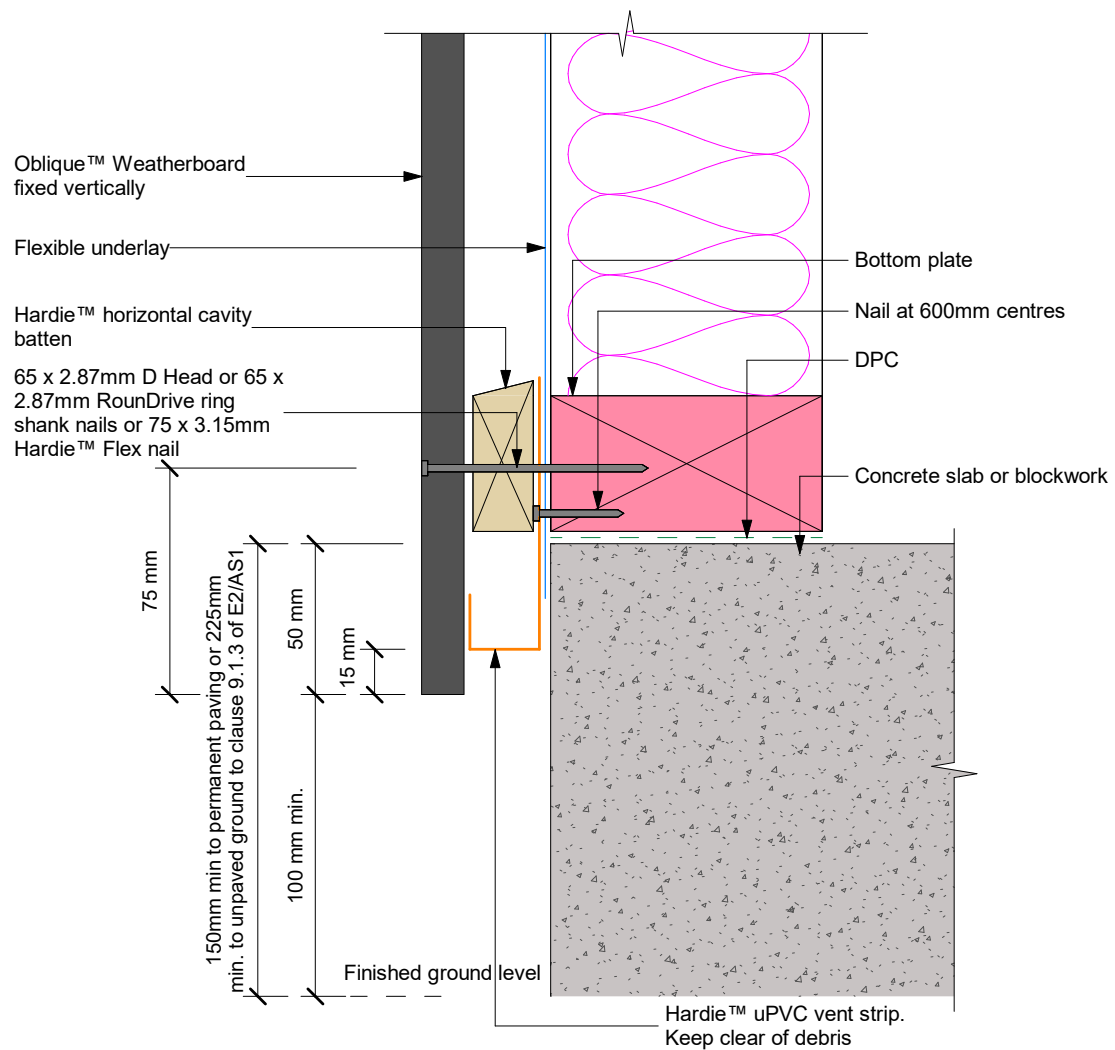


Figure 6: Foundation detail



Note: Site cut edges to be primed

Figure 7: Enclosed deck

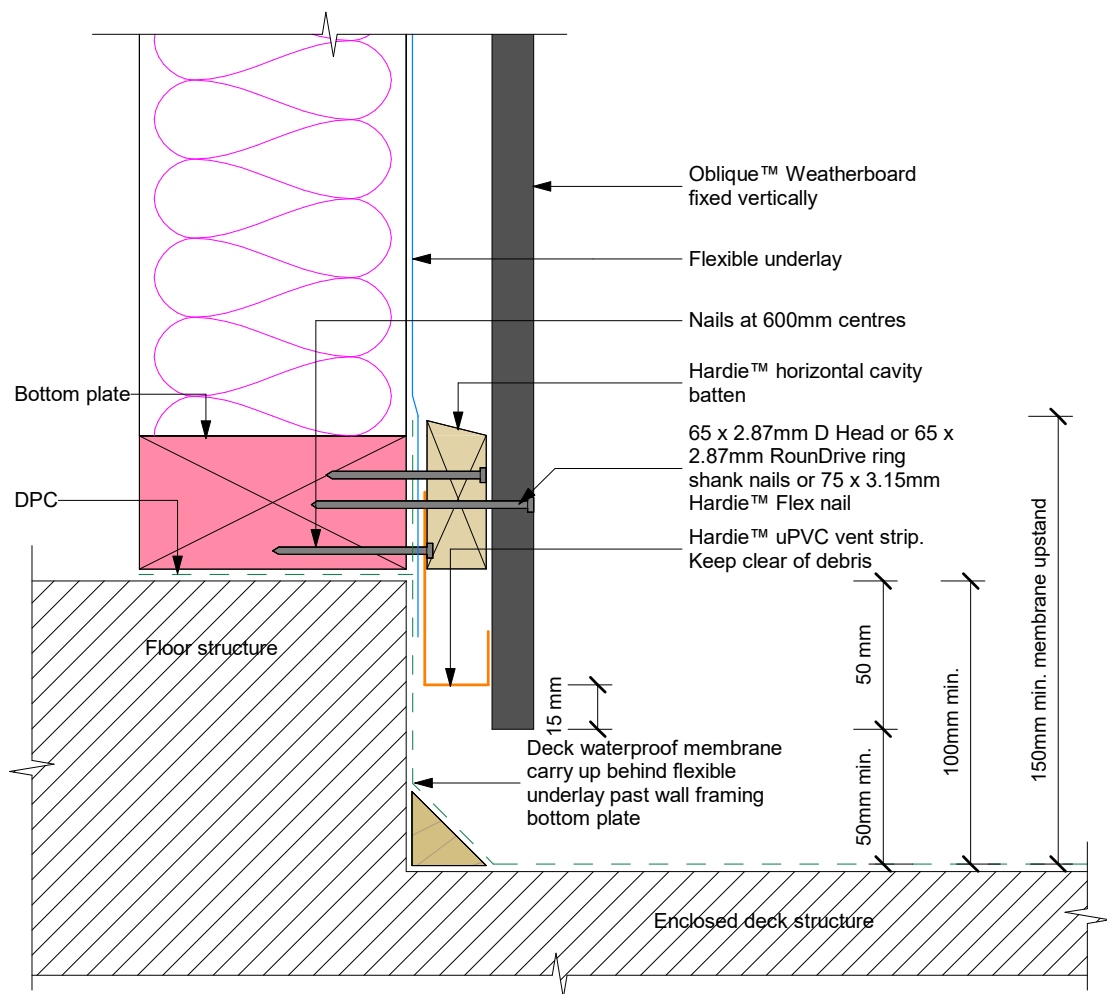


Figure 8: External aluminium box corner

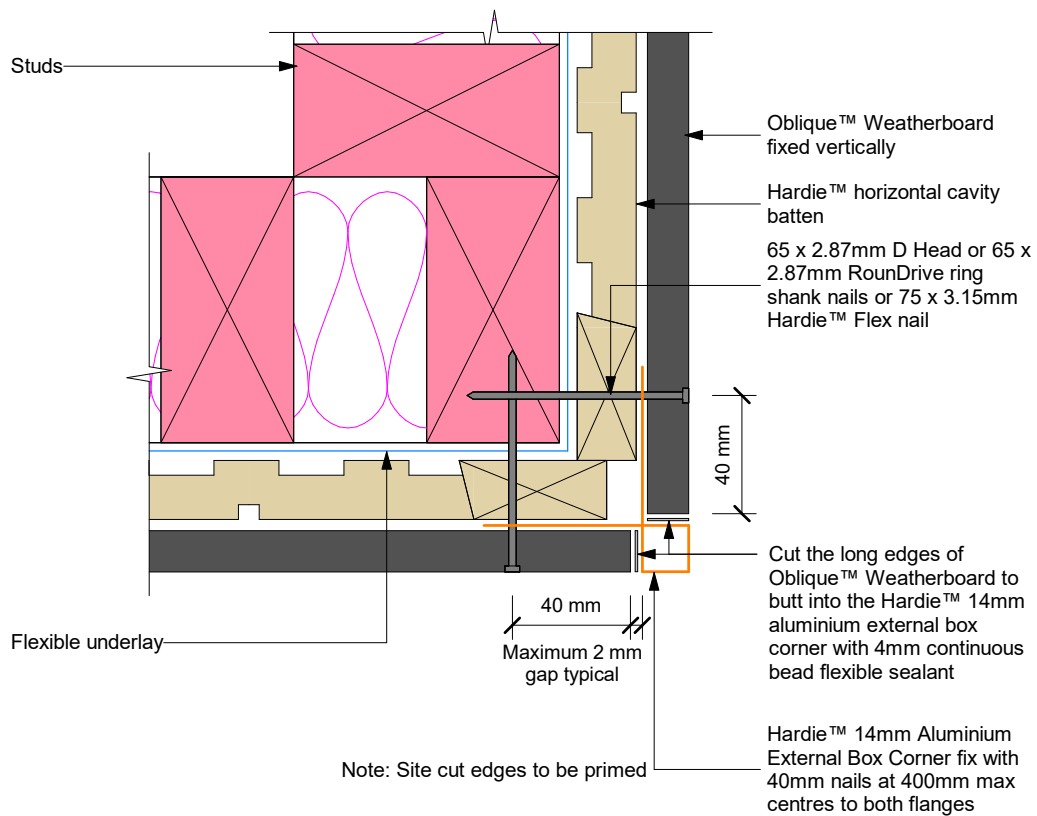
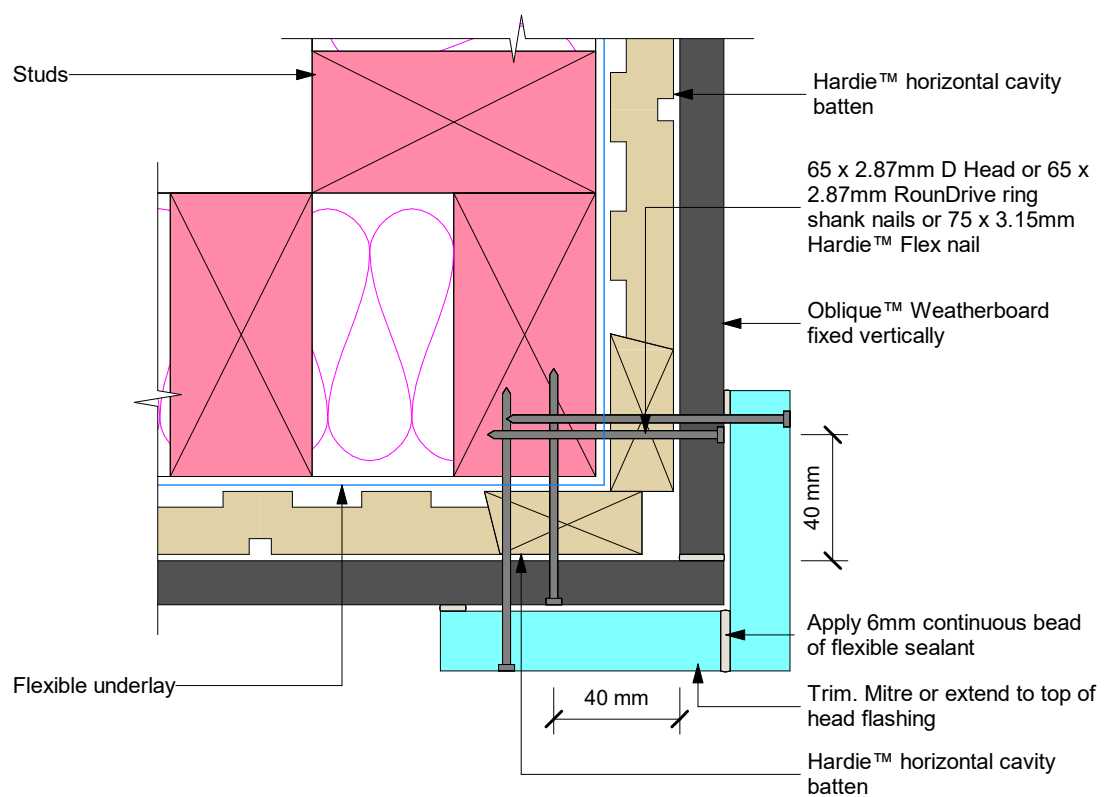


Figure 9: External aluminium box corner negative detail



Note: Site cut edges to be primed

Figure 10: Internal aluminium corner - Option A

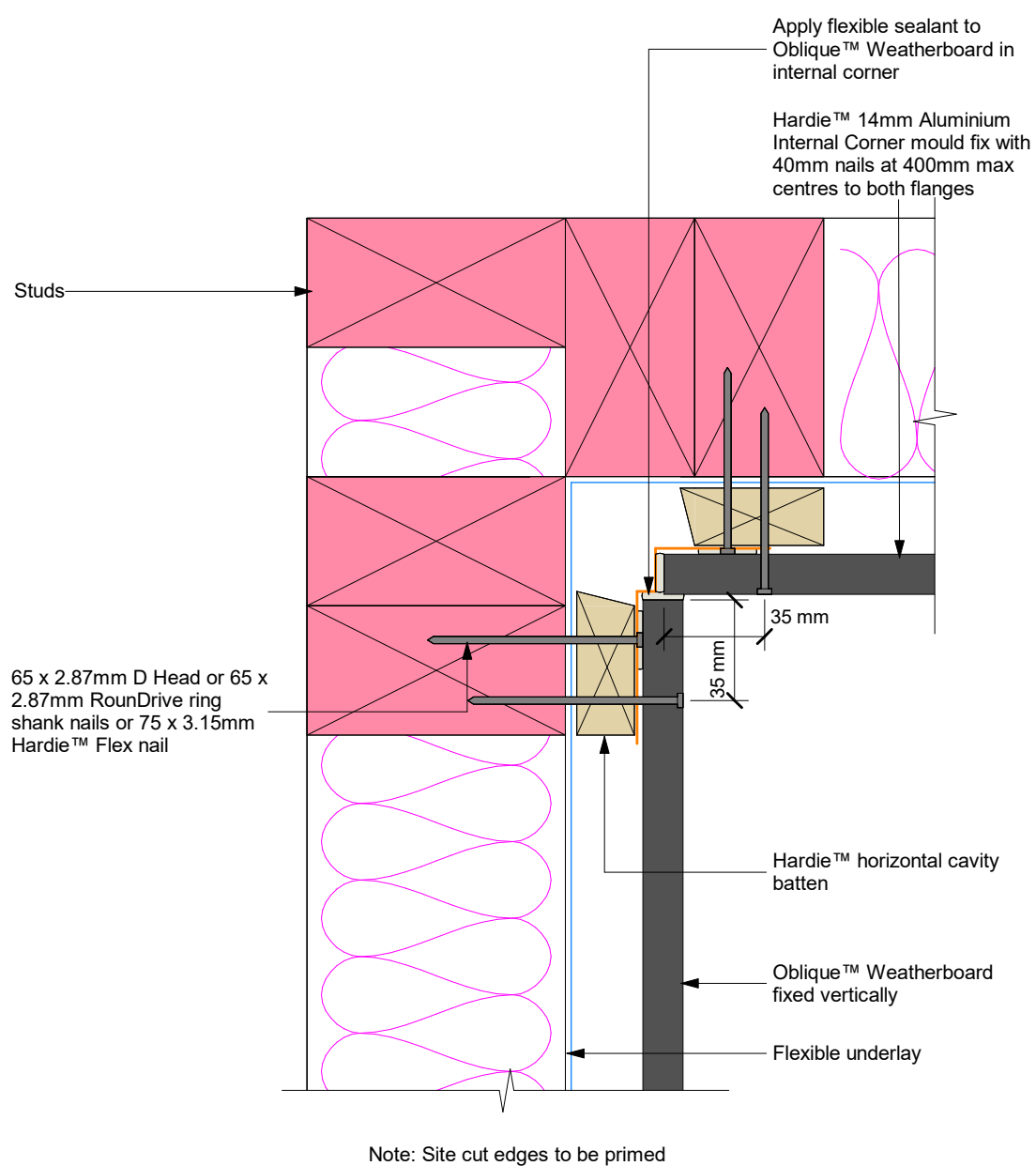
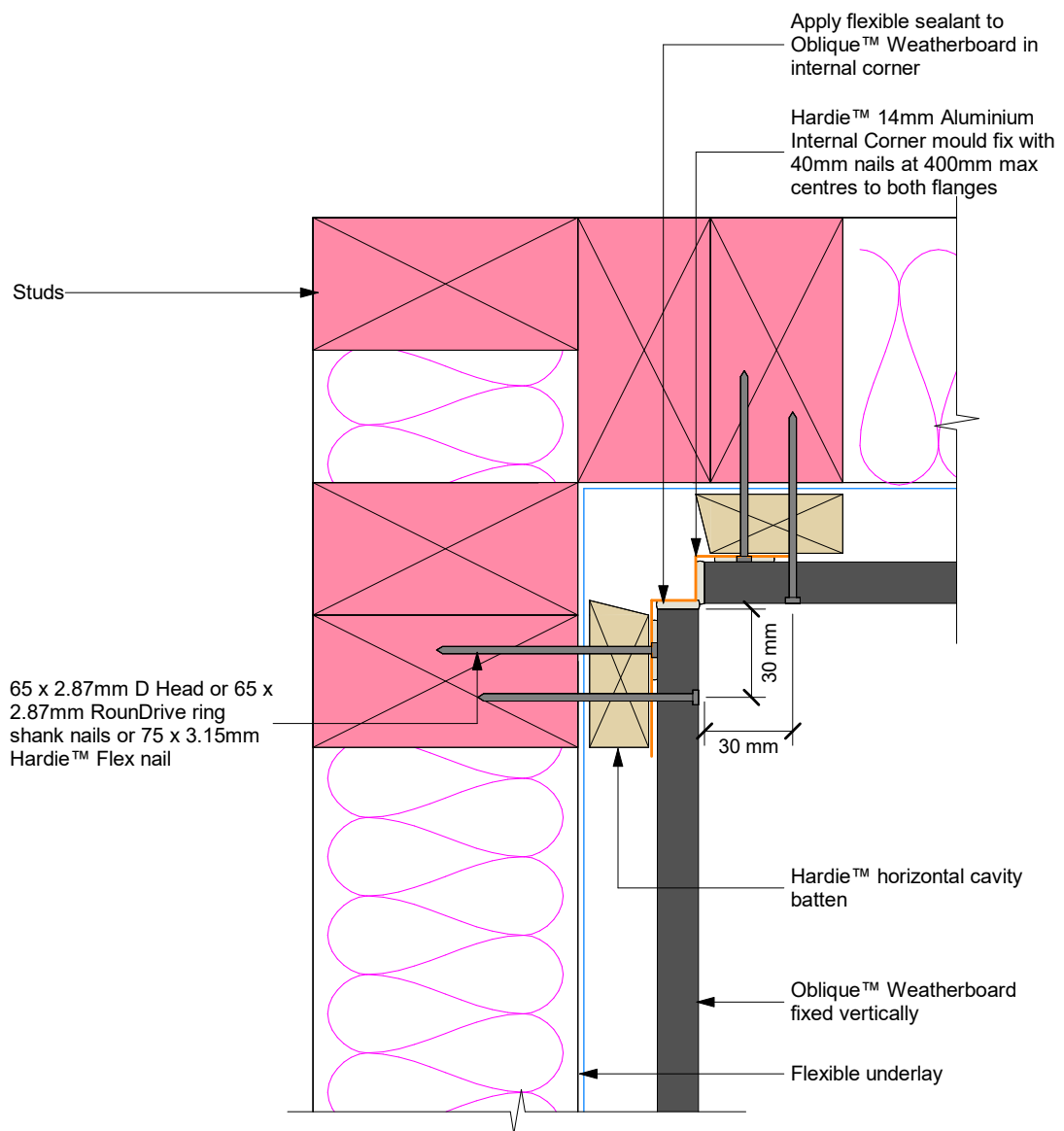


Figure 11: Internal aluminium corner - Option B



Note: Site cut edges to be primed

Figure 12: Soffit detail

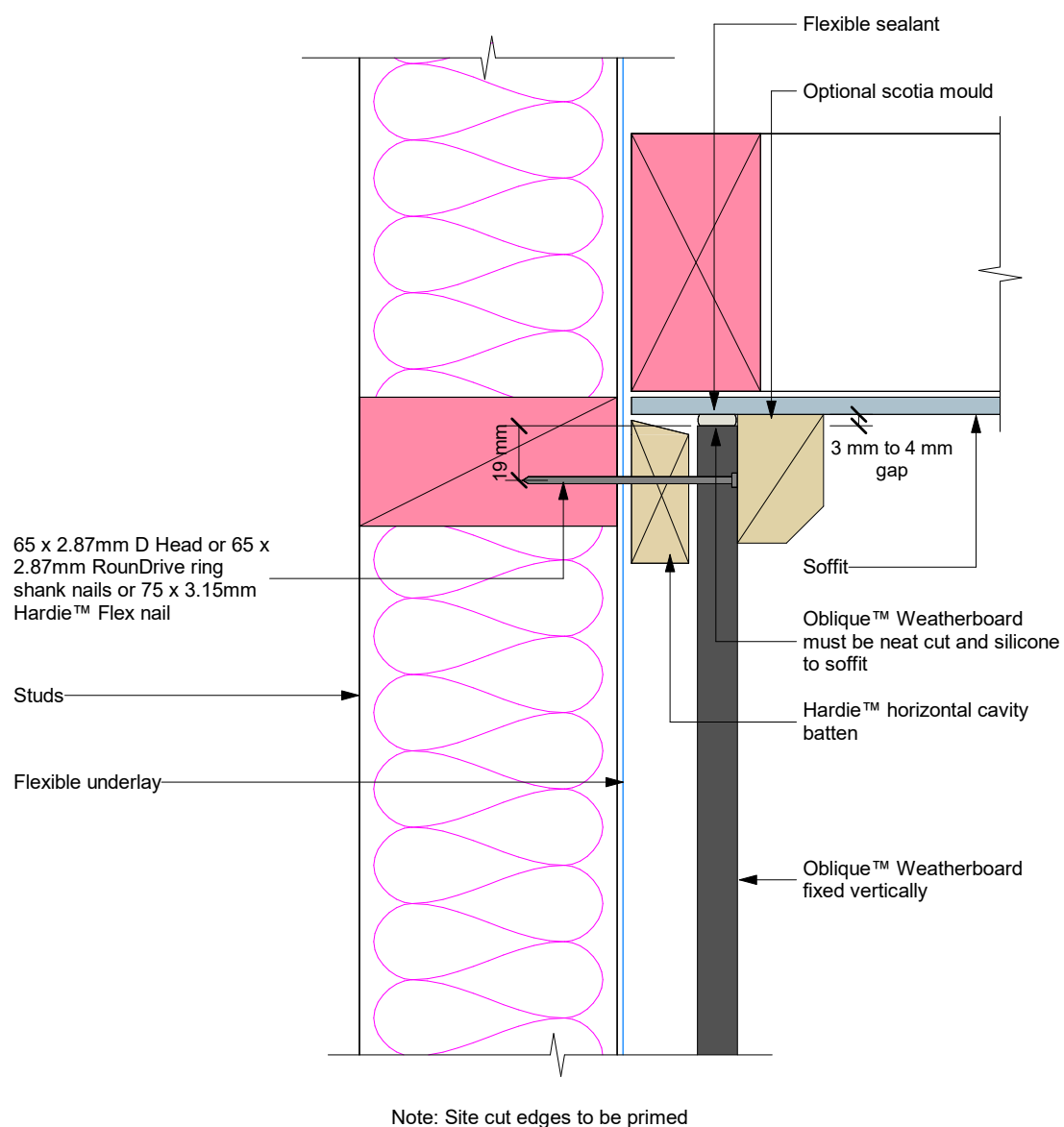


Figure 13: Nil soffit detail

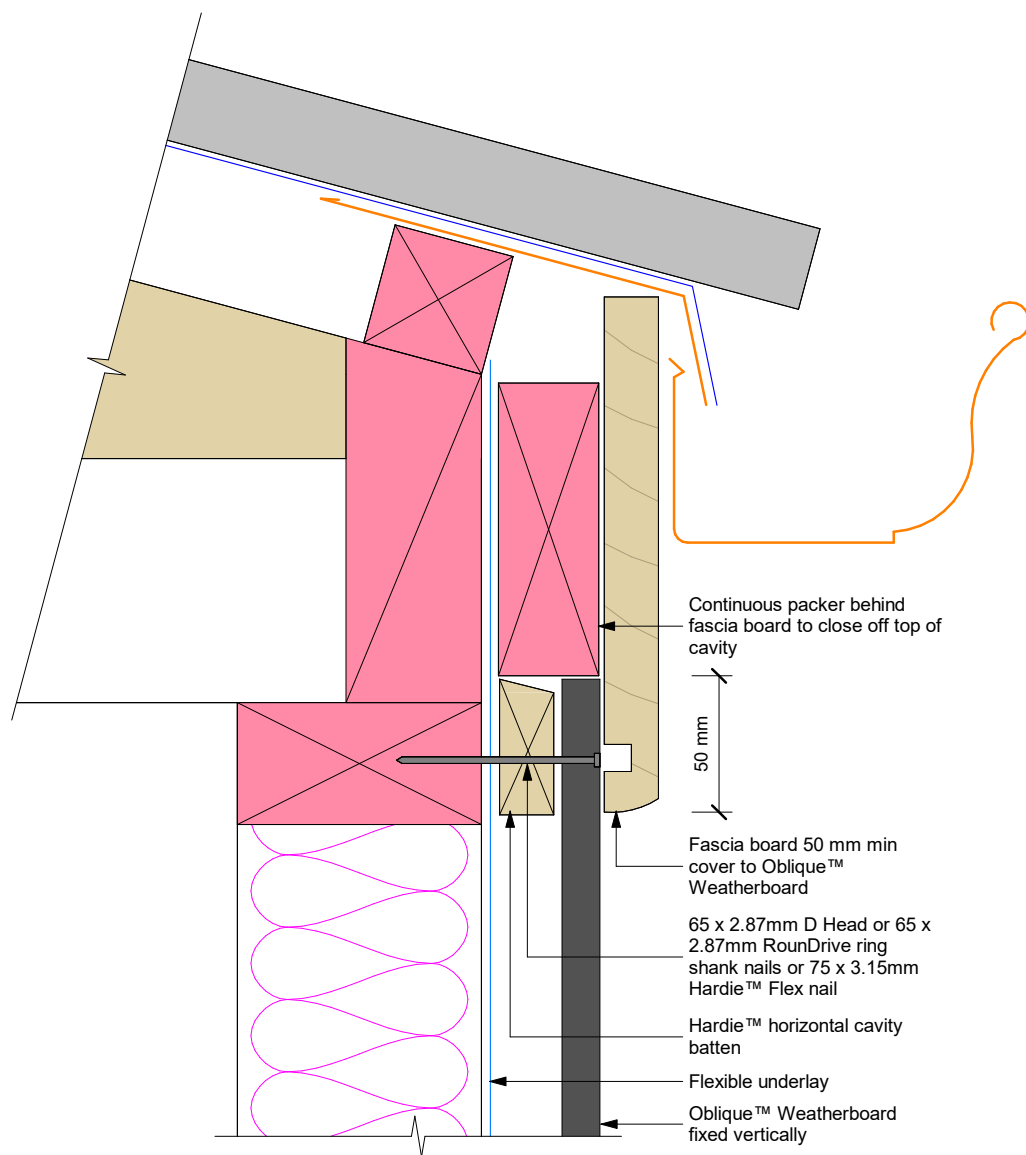


Figure 14: Soffit detail top ventilation

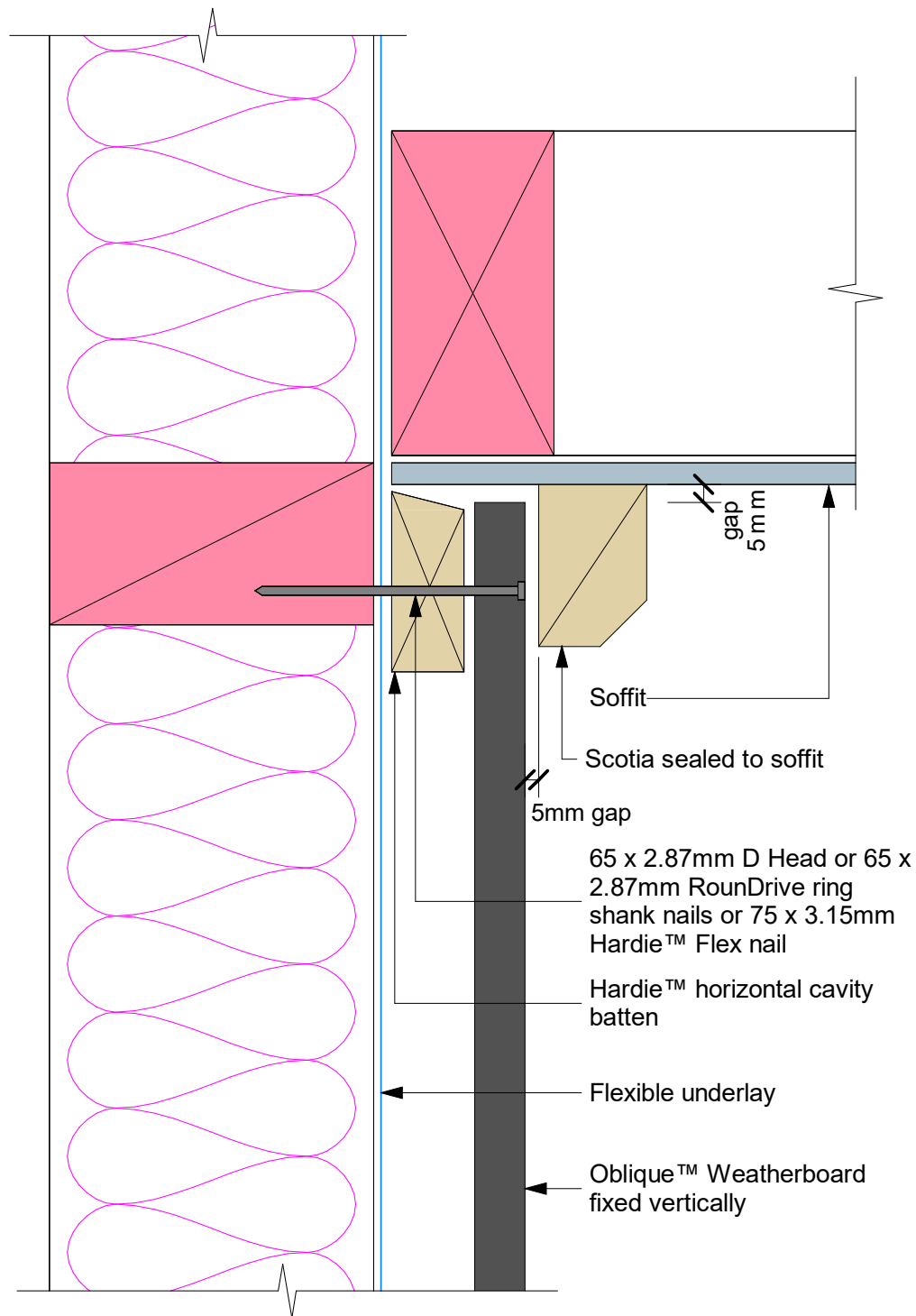


Figure 15: Nil soffit detail top ventilation

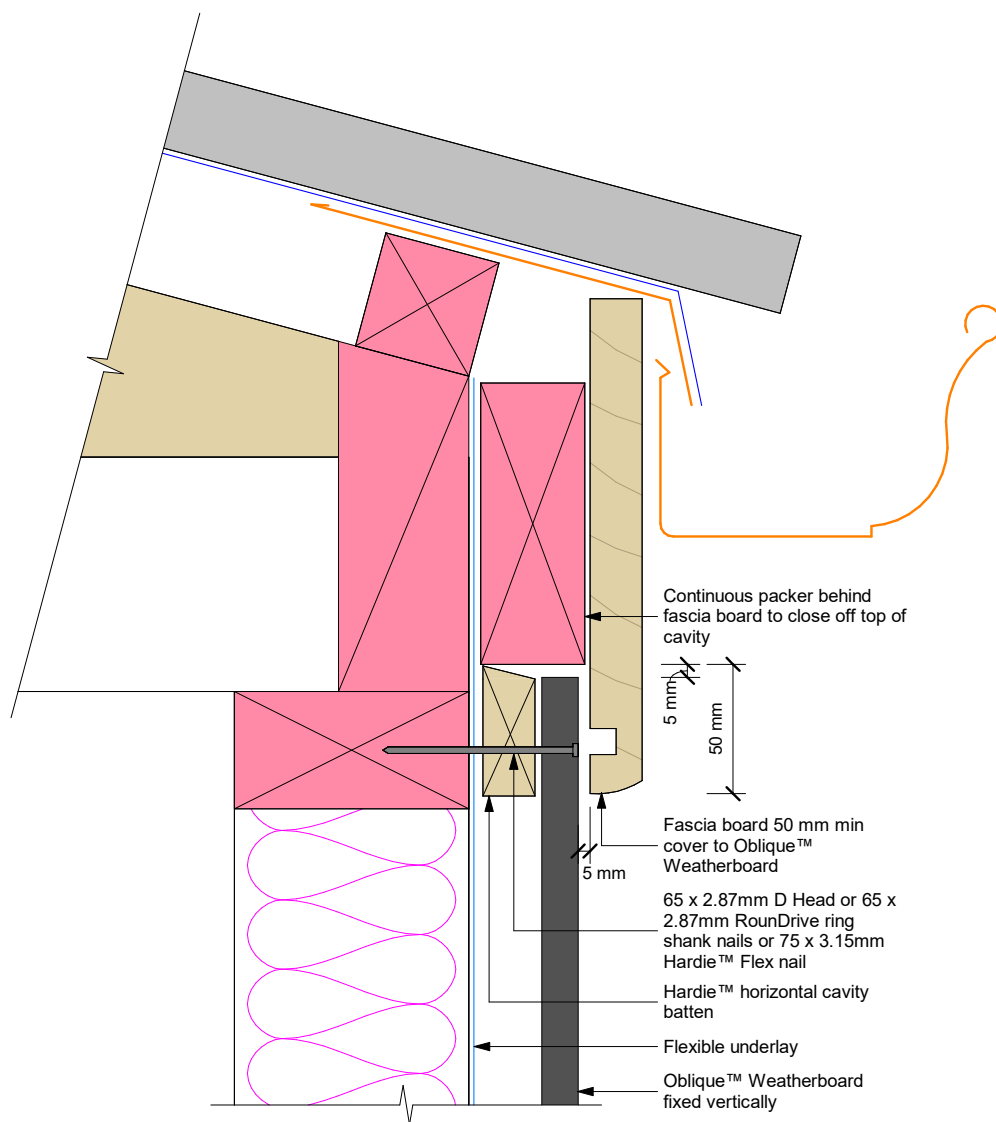
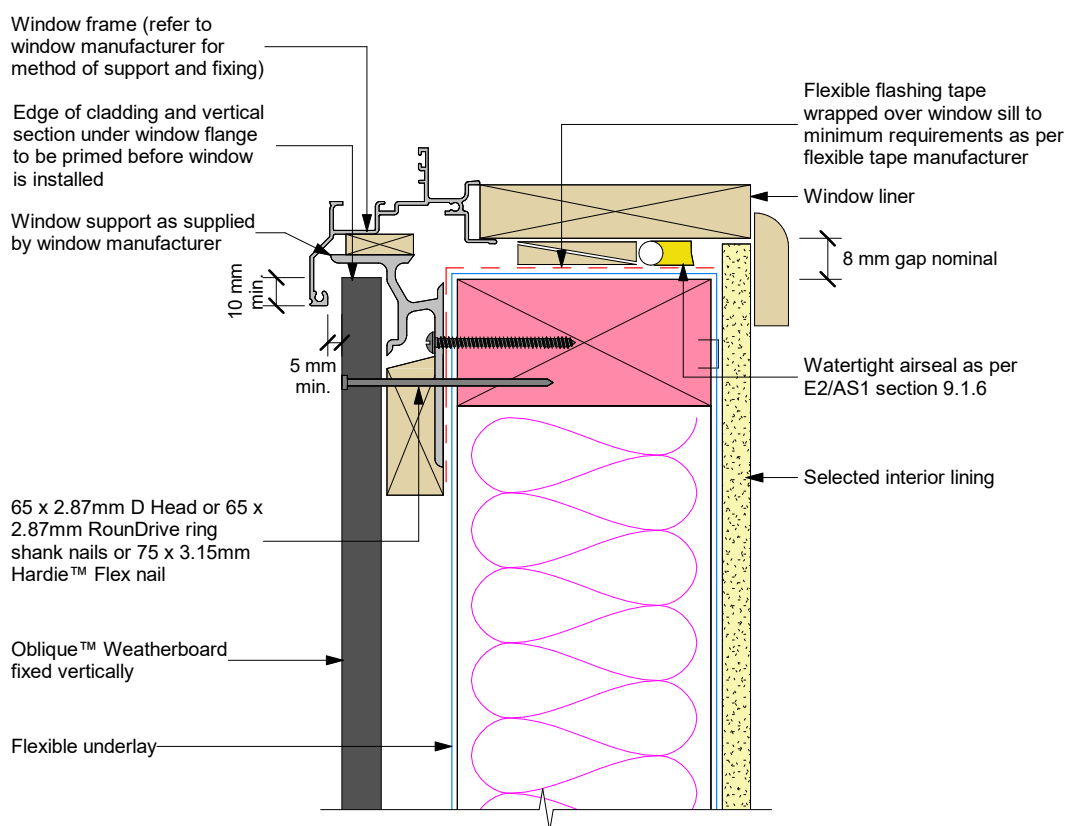


Figure 16: Window sill

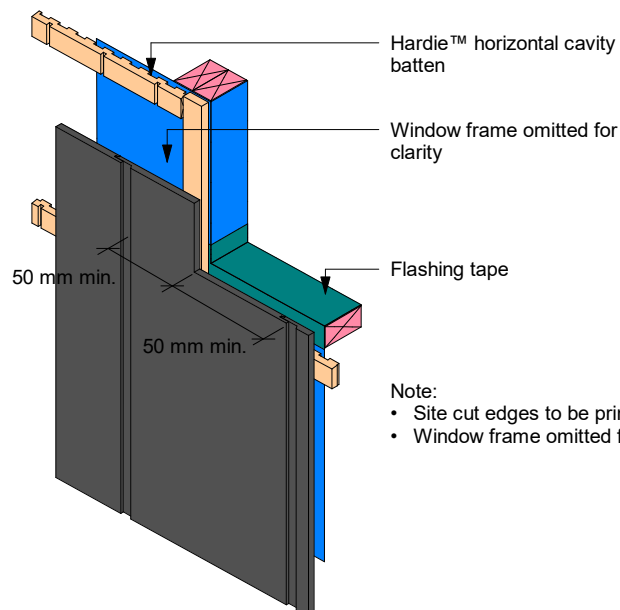
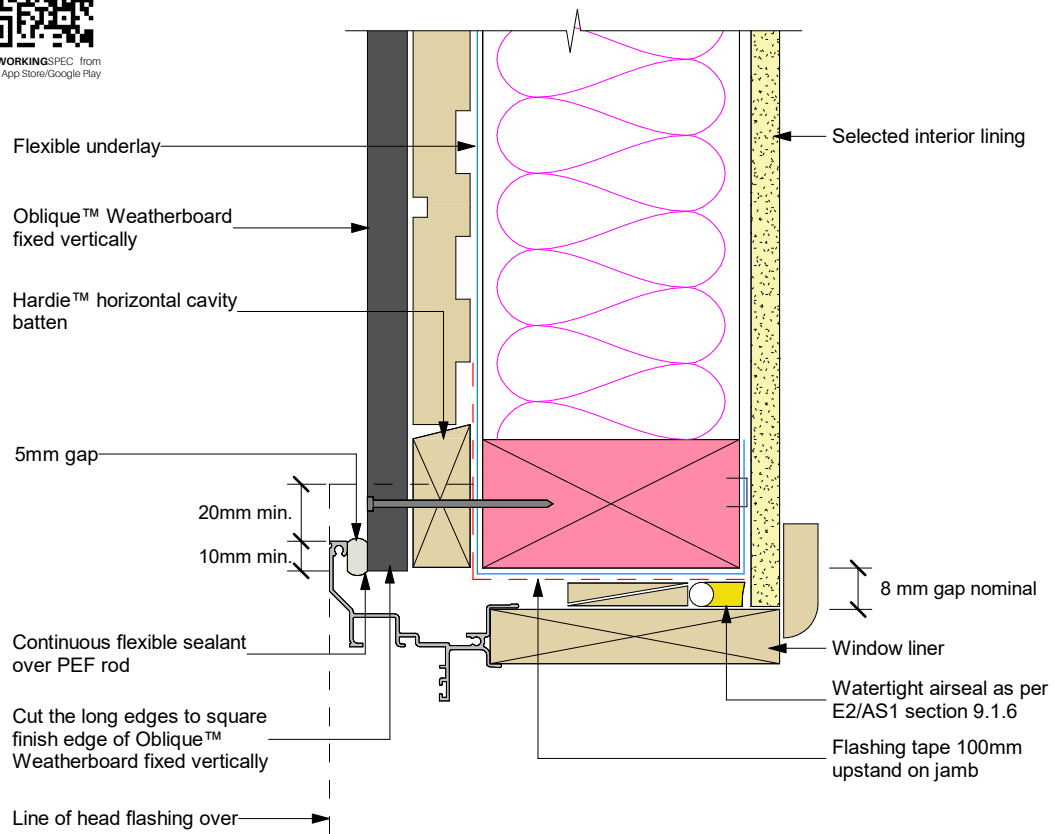


General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of the NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. When HomeRAB™ Pre-Cladding/RAB™ Board is used flashing tape to be applied to the entire window opening

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

Figure 17: Window jamb



- Note:
- Site cut edges to be primed
 - Window frame omitted for clarity

Figure 18: Window jamb with scribe

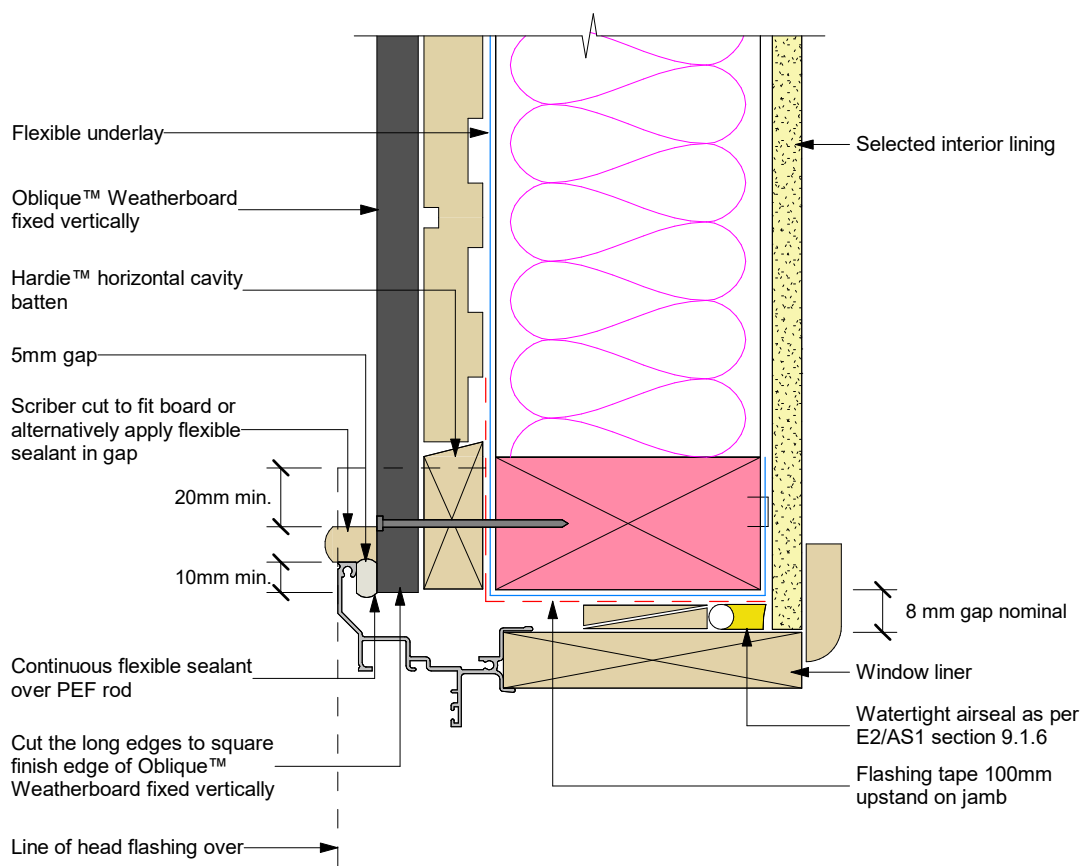
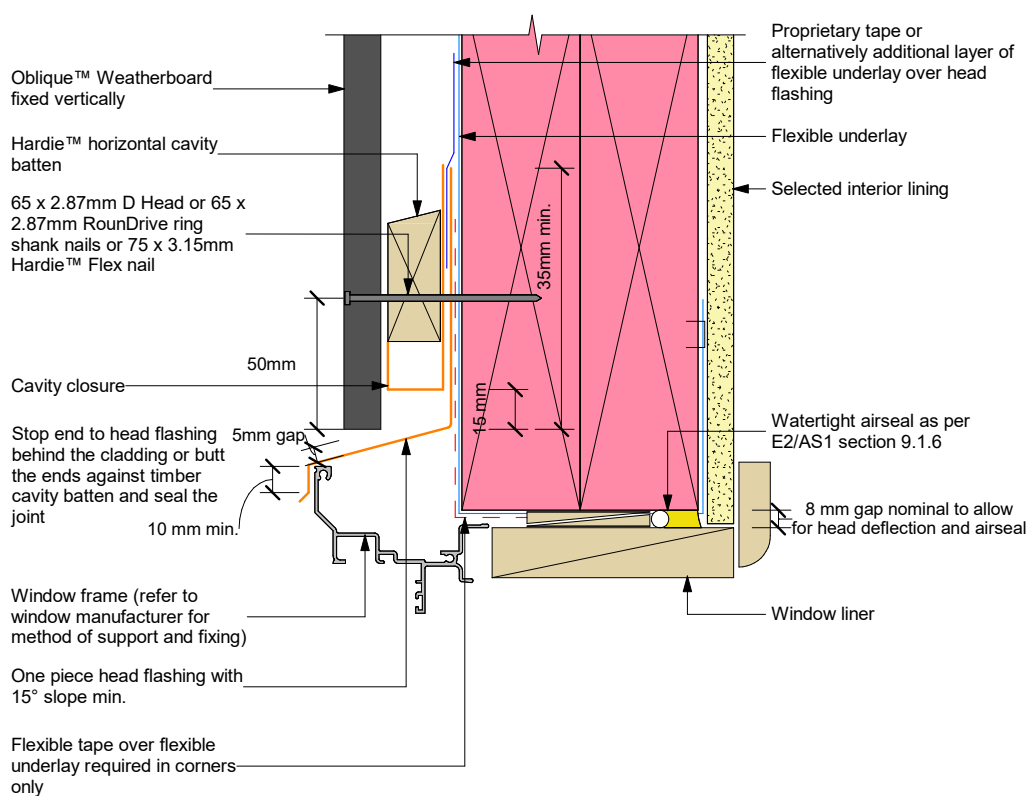


Figure 19: Window head with cladding cut around head flashing

interactive assembly
instructions available
<http://wksp.nz/jh-ilo-vwin>



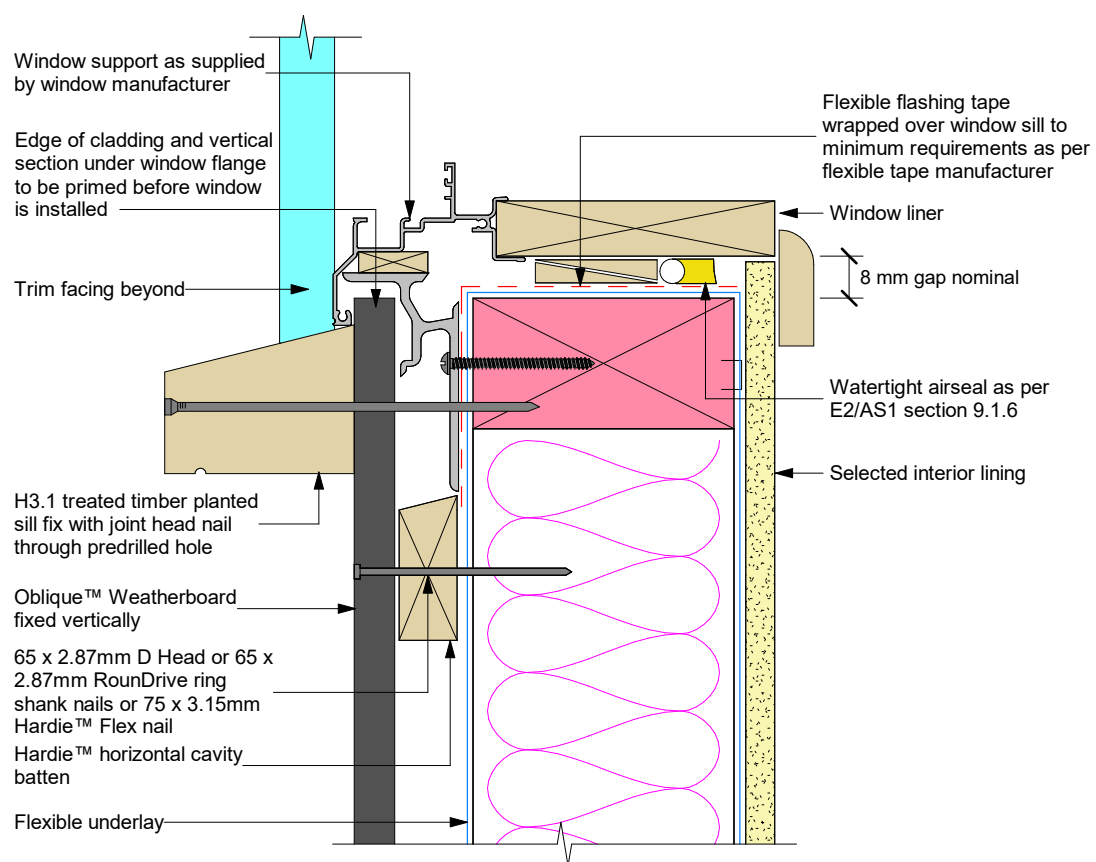
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Note:

1. Site cut edges to be primed
2. Sealant must be installed between head flashing and window flange in VH and above wind zones. Refer to Figure 71 of E2/AS1

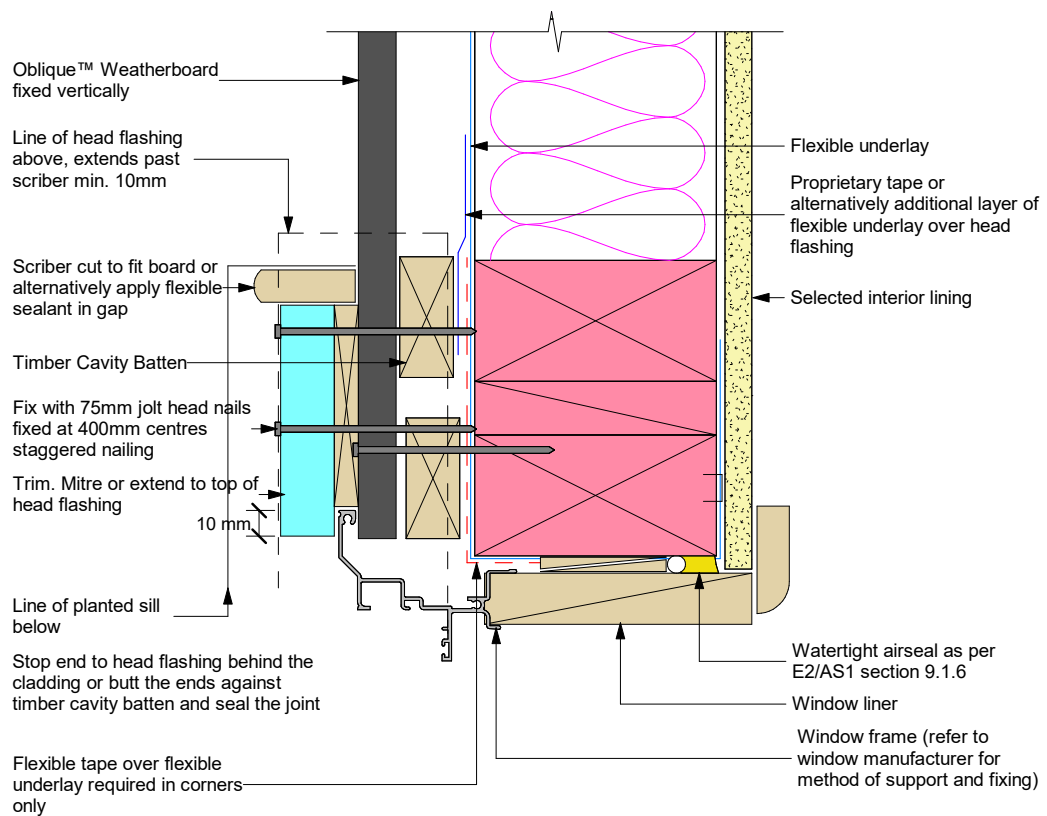
Figure 20: Window sill with facing



General notes for materials selection

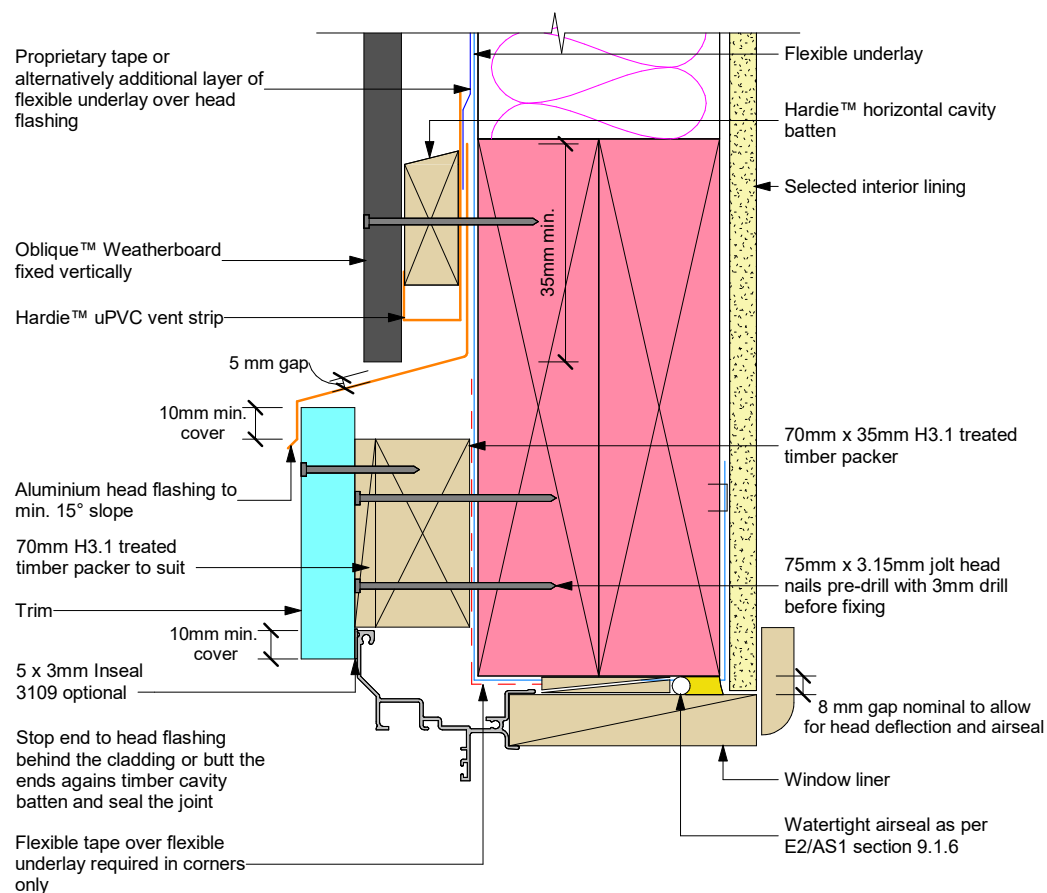
1. Flexible underlay must comply with acceptable solution E2/AS1
2. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Figure 21: Window jamb with facing



Note: Site cut edges to be primed

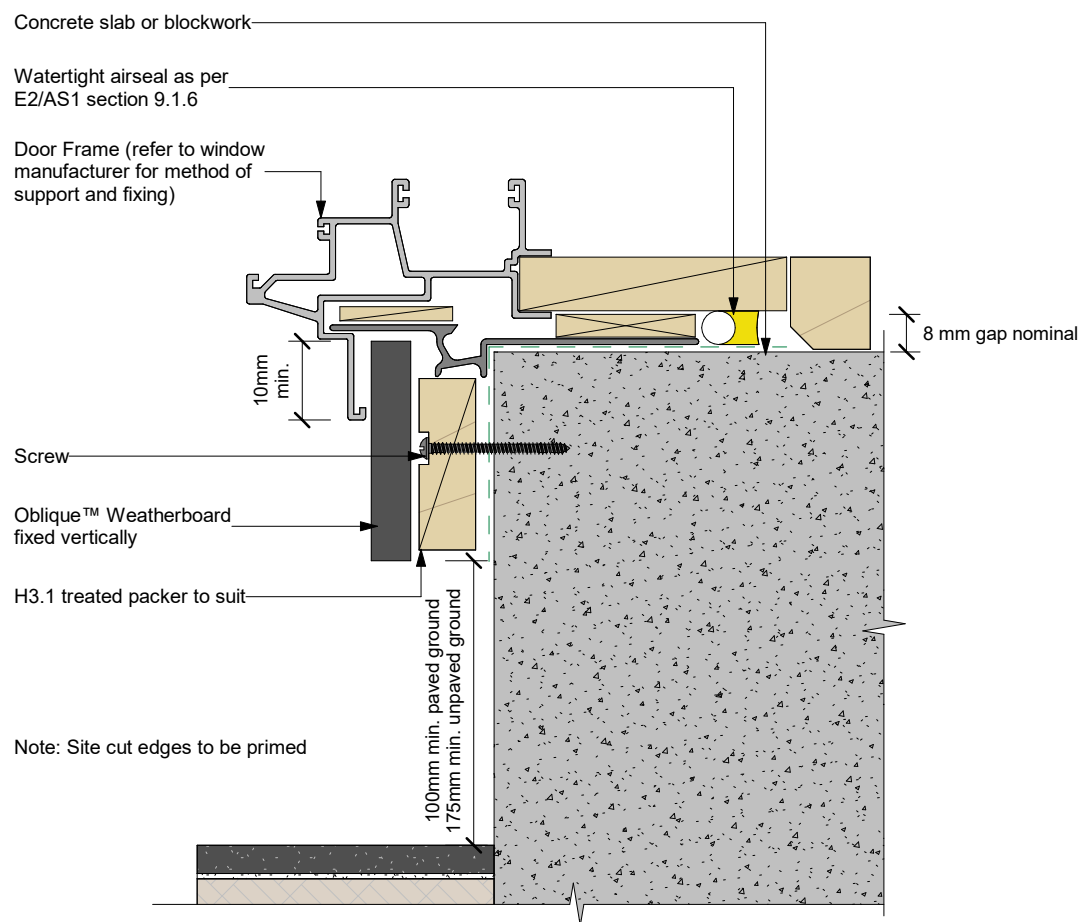
Figure 22: Window head with facing



Note:

- Sealant must be installed between head flashing and Trim in VH and EH wind zones and SED pressures
- Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1

Figure 23: Door sill support detail

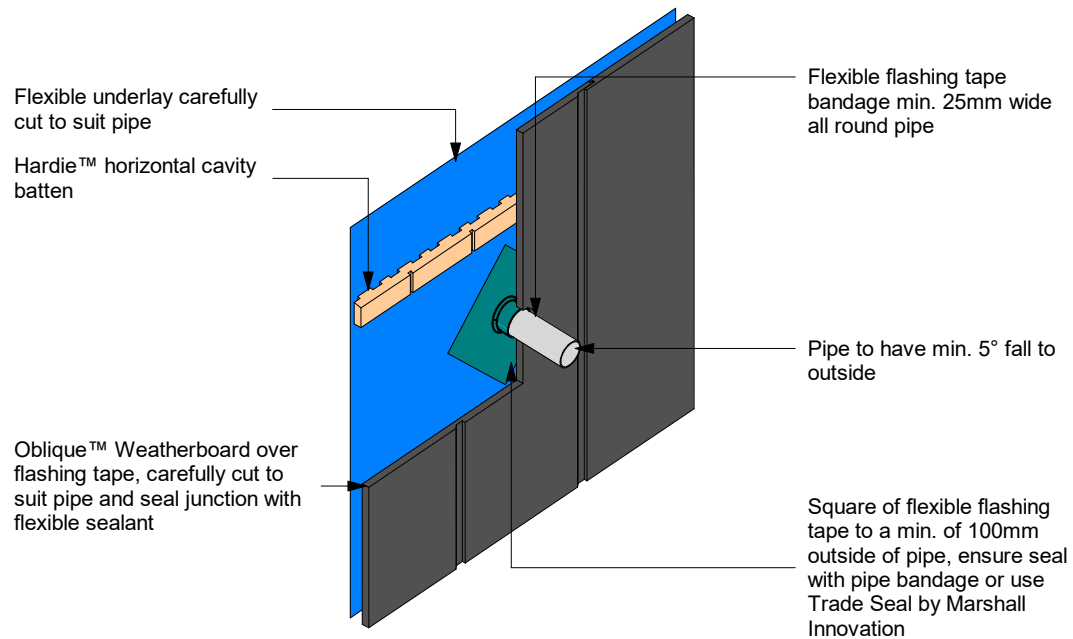


Refer to the manufacturer or supplier for technical information for these materials

General notes for materials selection

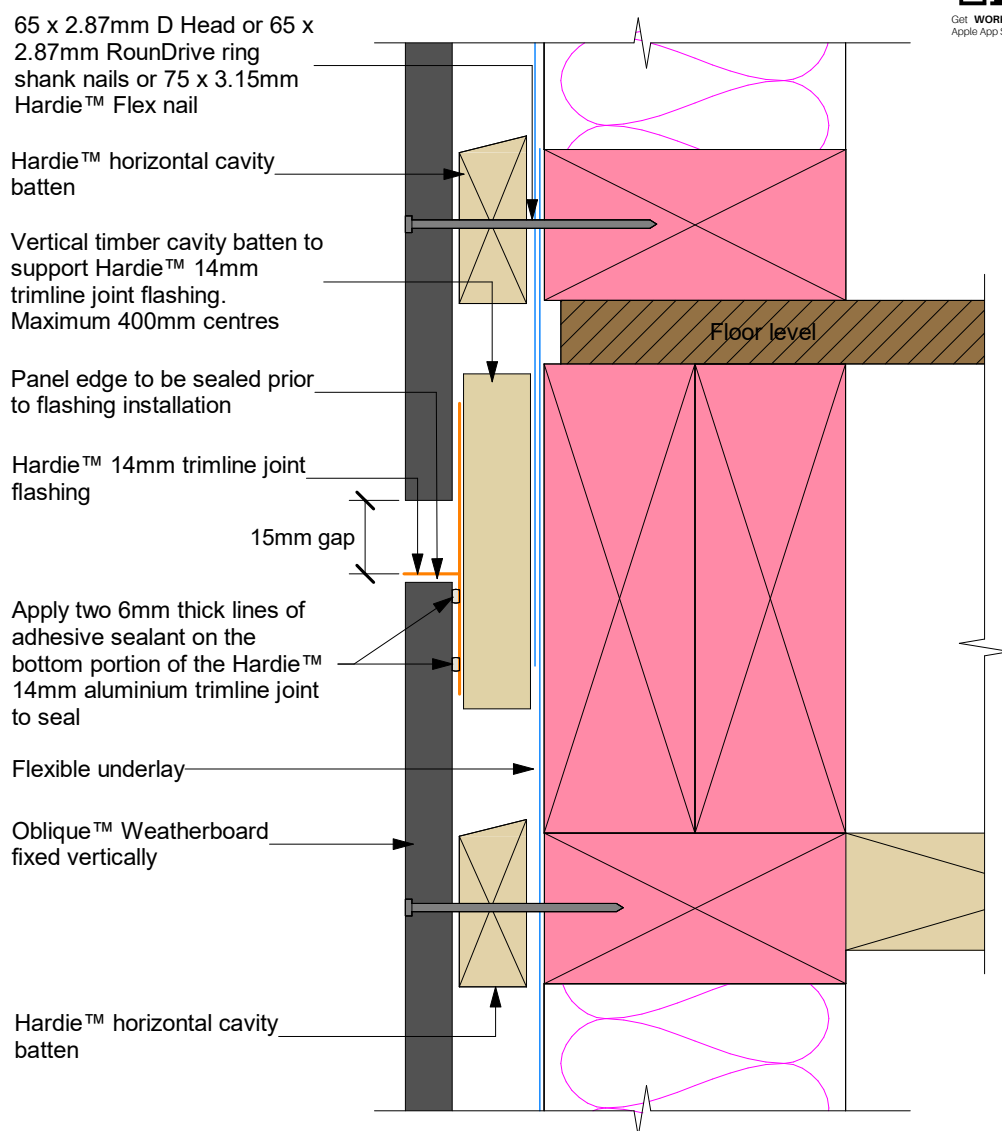
1. Flexible underlay must comply with acceptable solution E2/AS1
2. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Figure 24: Pipe penetration



Note: Site cut edges to be primed

Figure 25: Trimline joint flashing at floor level



Notes:

- The flashing to be placed in the centre of the floor joists. Do not fix cavity battens or cladding into floor joists
- Hardie™ 14mm aluminium trimline joint, take care to ensure continuous seal is formed between panel and the trimline joint
- Trimline horizontal jointer 'L' shaped flashing will be required over the butt joint of the Hardie™ 14mm aluminium trimline joint
- Site cut edges to be primed



Figure 26: Continous cladding over joist at floor level

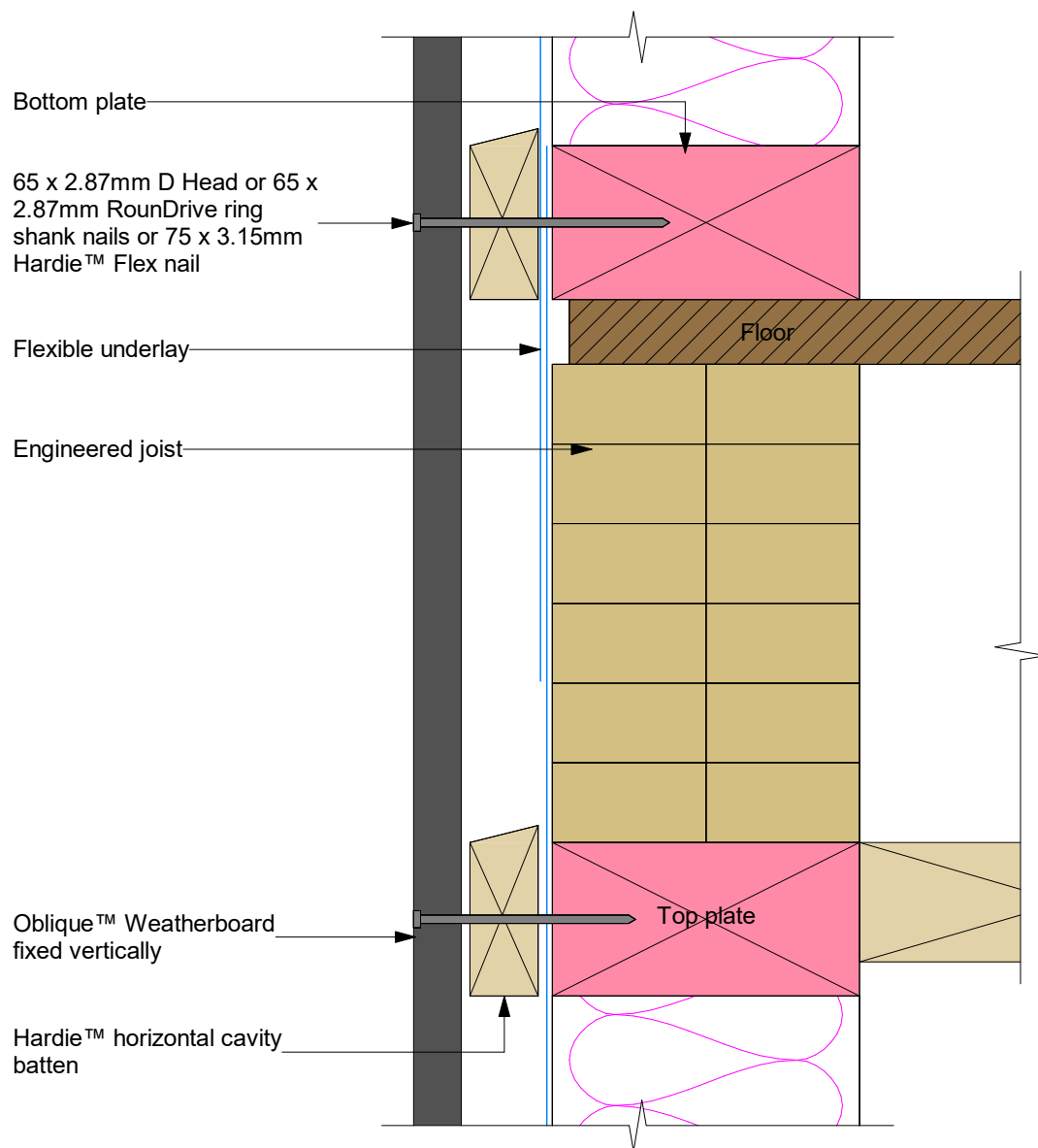
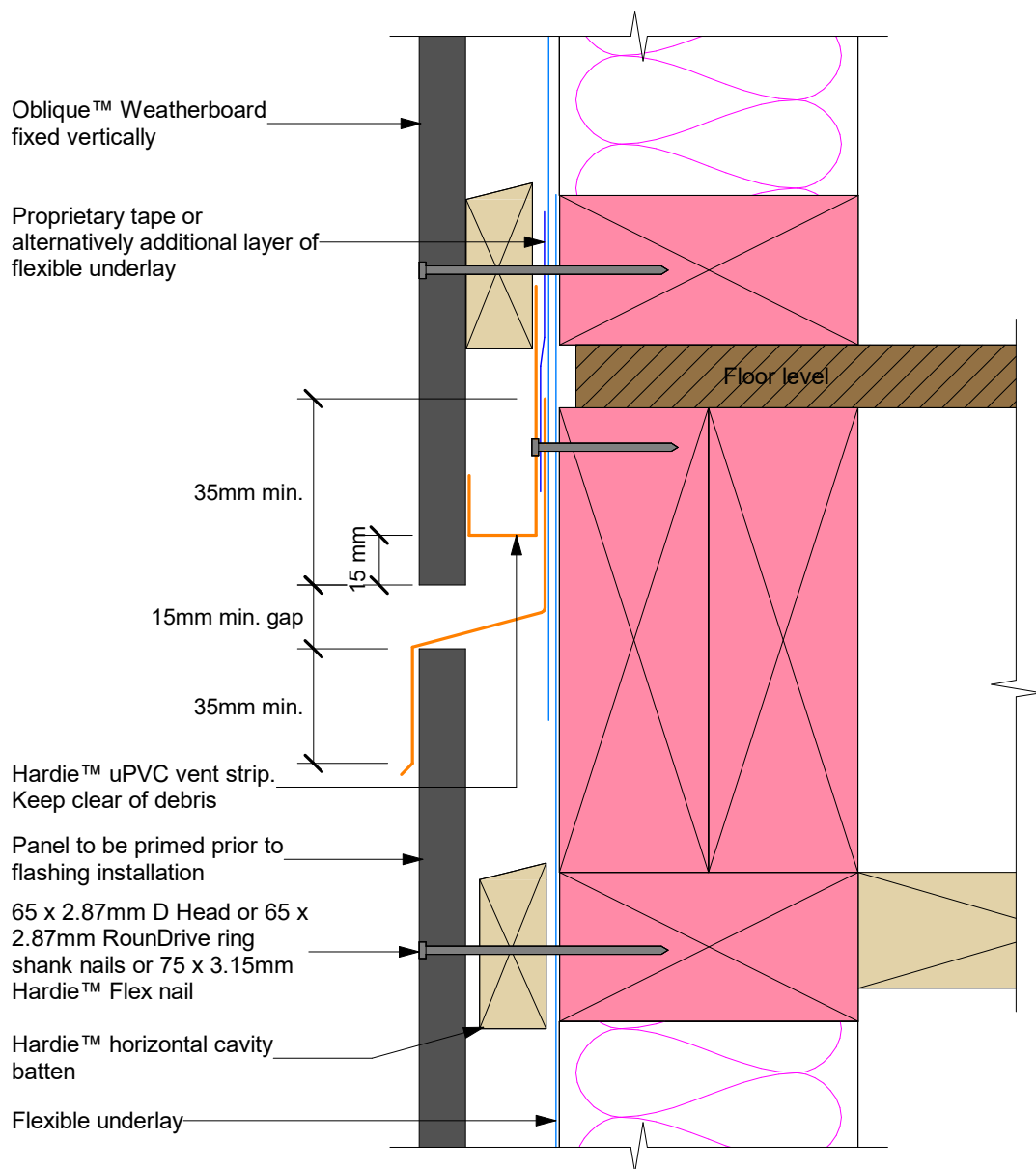


Figure 27: Drained flashing joint at floor level



Note:

- This detail is required to limit cavities to a maximum of 2 stories or 7 metres. Refer to E2/AS1 clause 9.1.9.4
- Check architect's plans for the type of flashing to be used
- Cut edges need to be primed
- When 50 year durability is required refer Table 20 E2/AS1
- The flashing to be placed in the centre of the floor joists. Do not fix timber cavity battens or cladding into floor joists

Figure 28: Trimline joint flashing at external corner

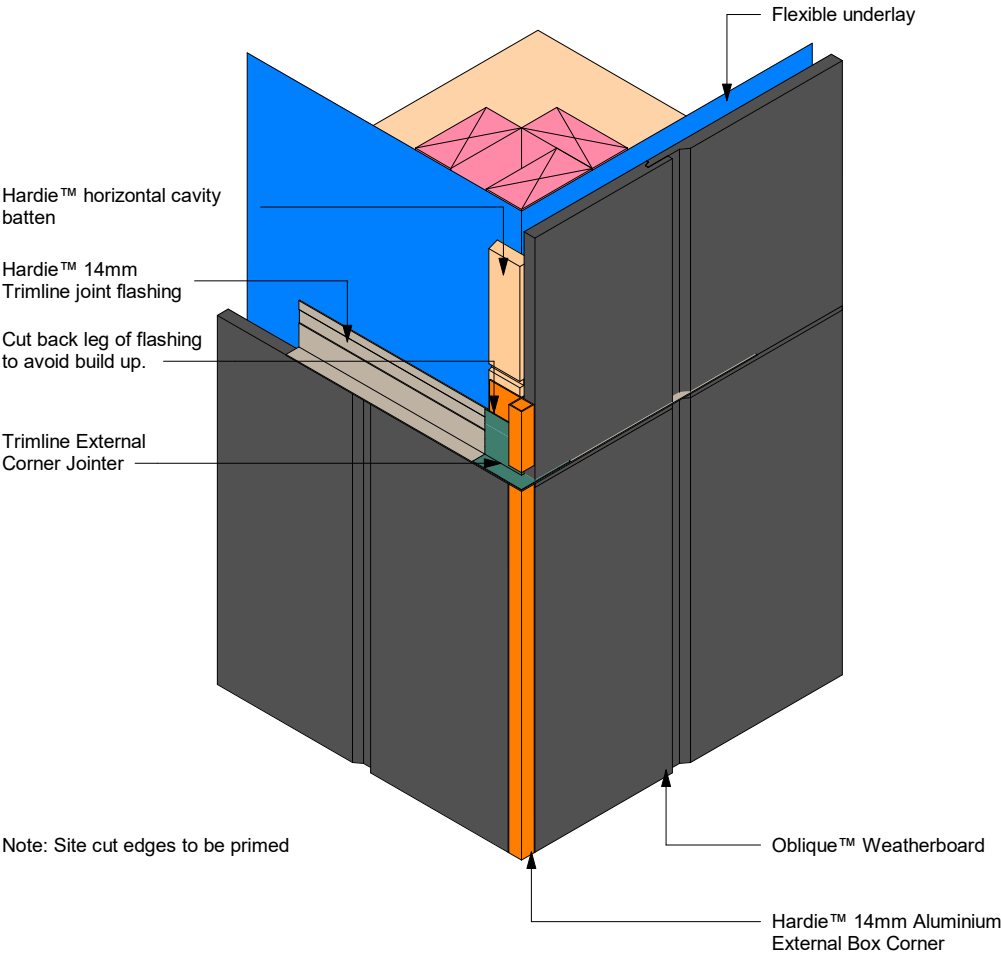


Figure 29: Trimline joint flashing at full external corner

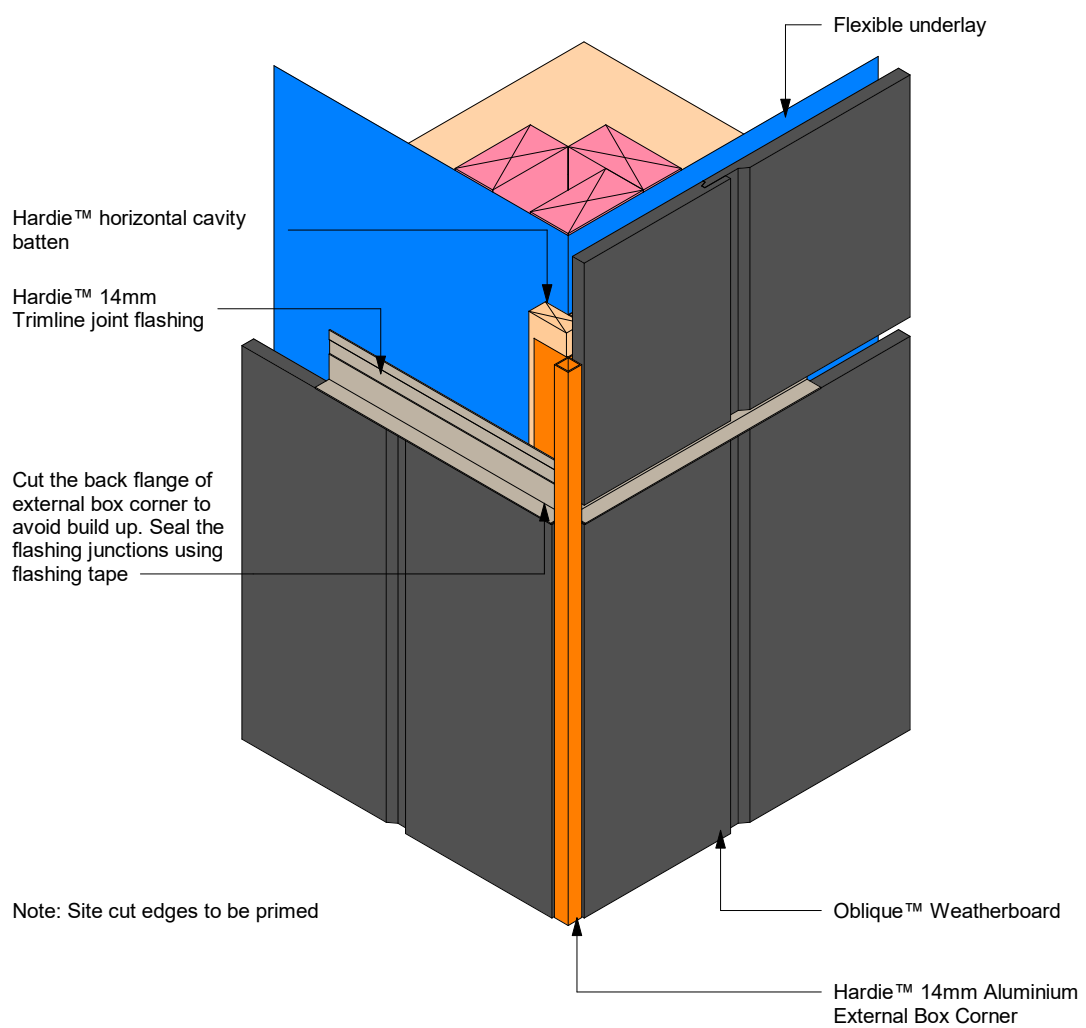


Figure 30: Trimline joint flashing

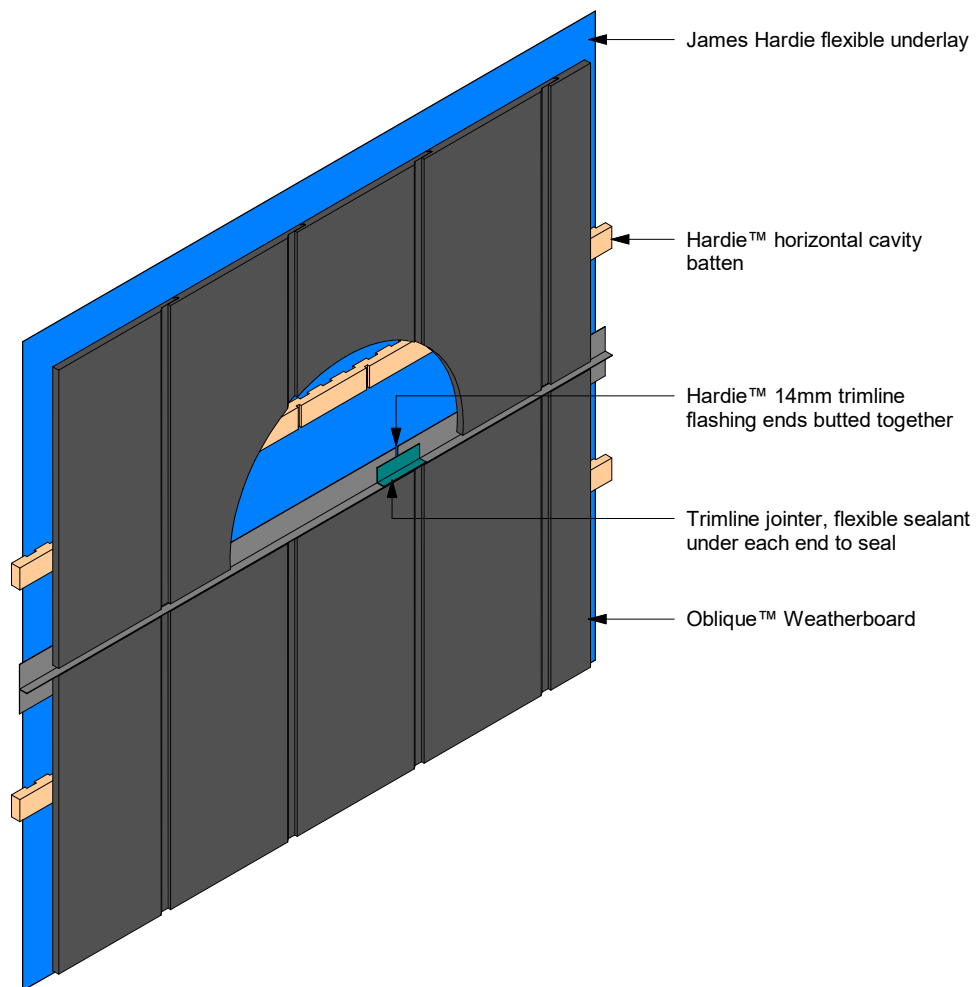


Figure 31: Trimline joint flashing at internal corner

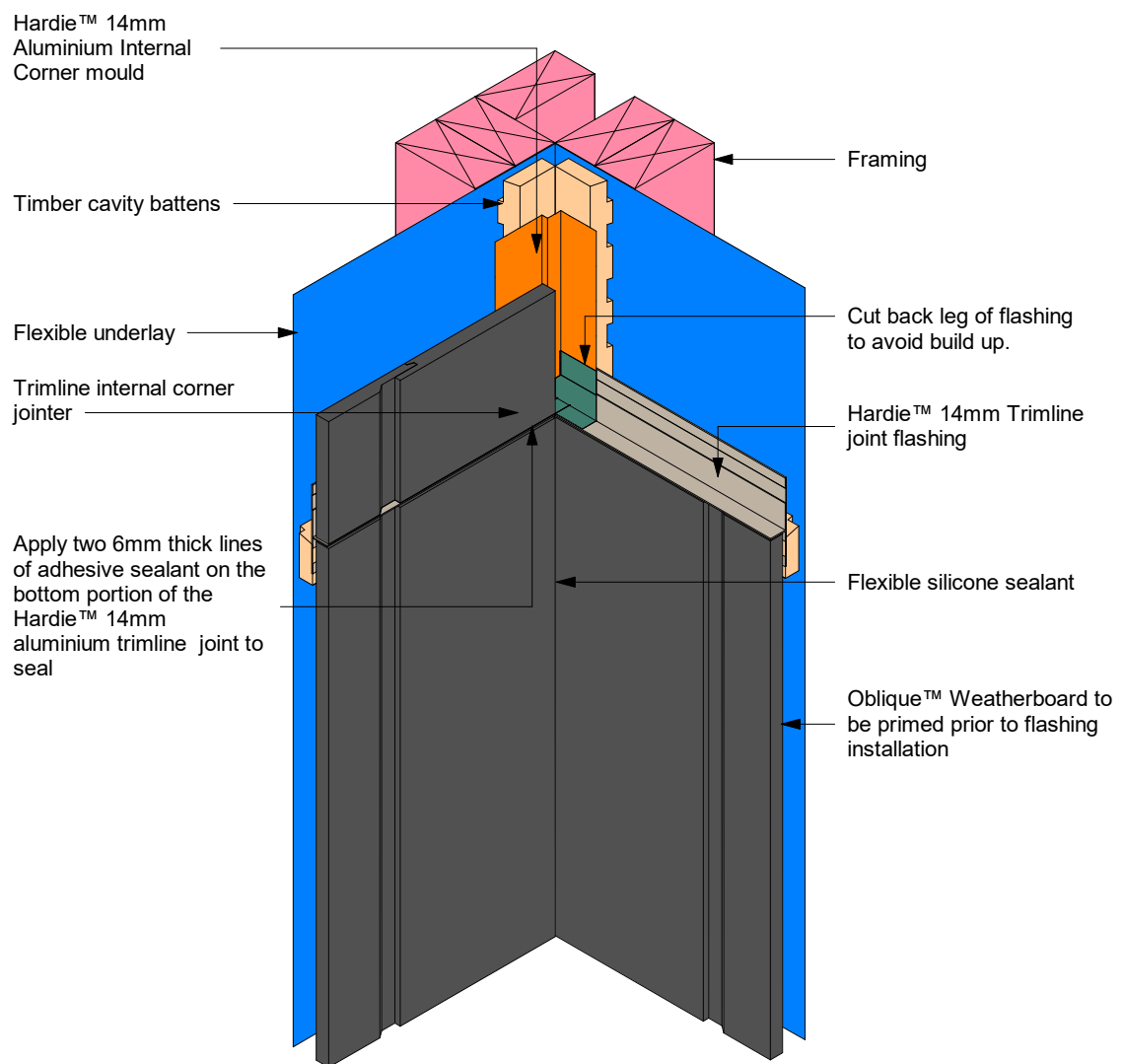
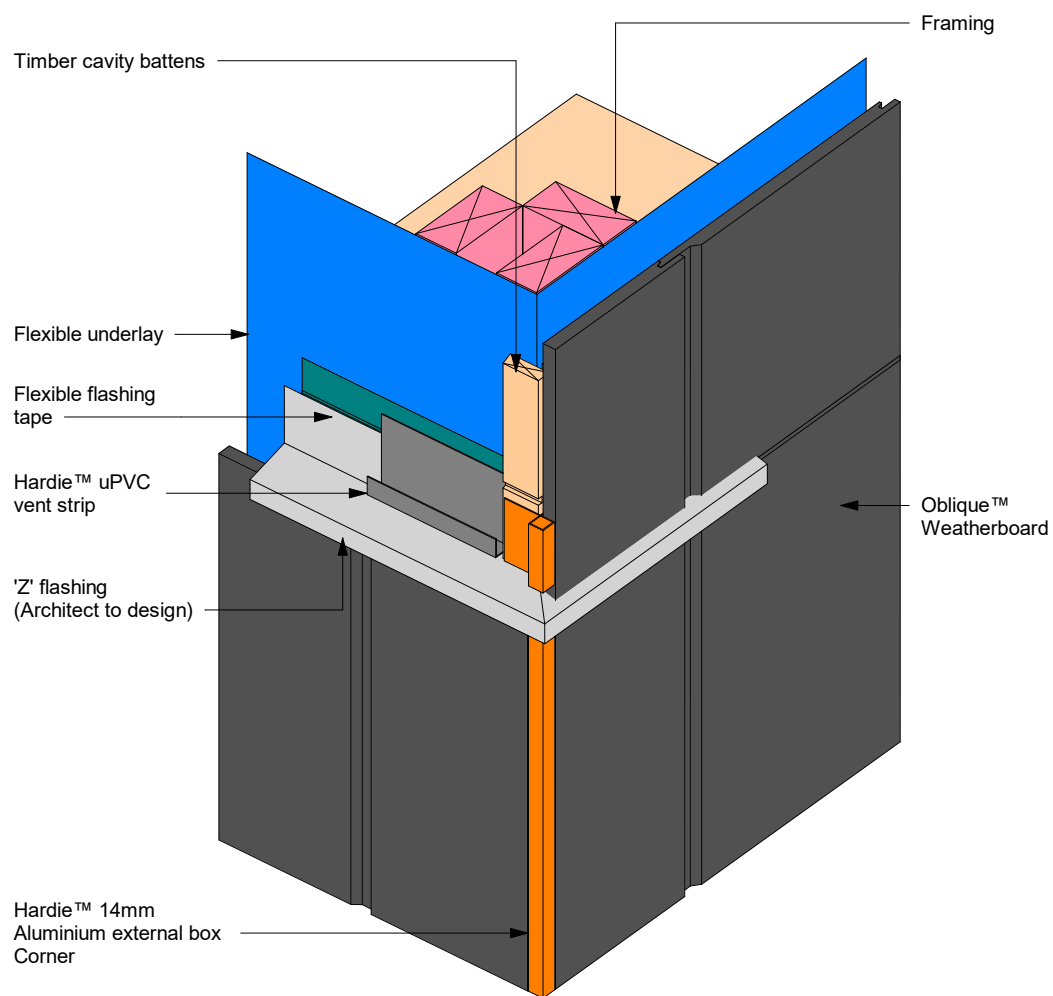


Figure 32: Drained flashing joint at external corner



Note: Site cut edges to be primed

Figure 33: Parapet flashing

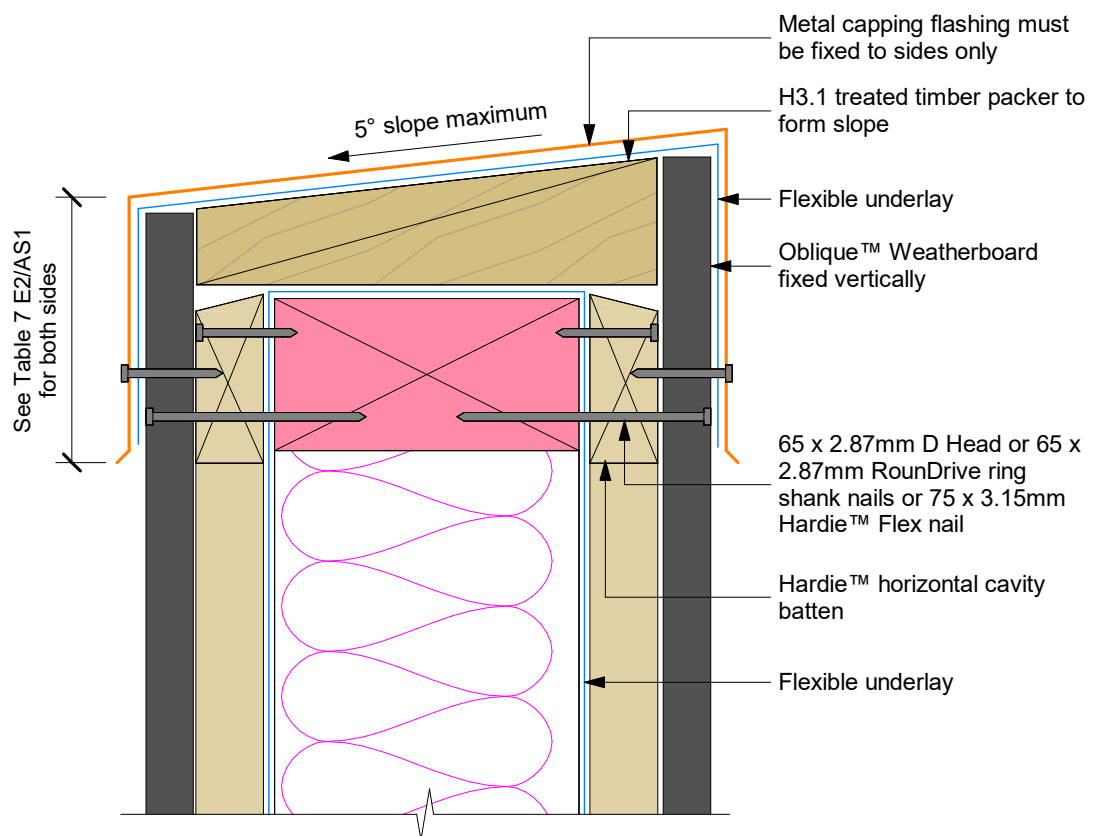


Figure 34: Roof to wall junction detail

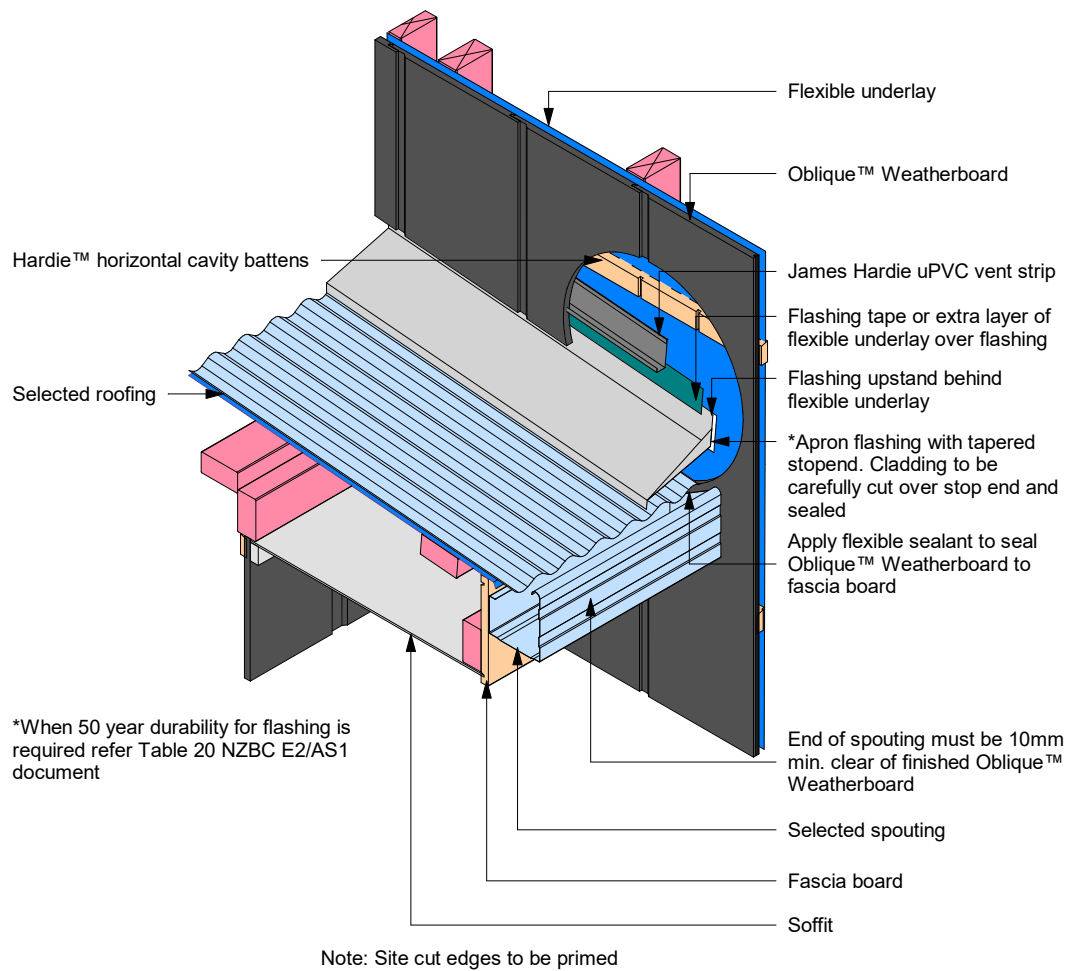
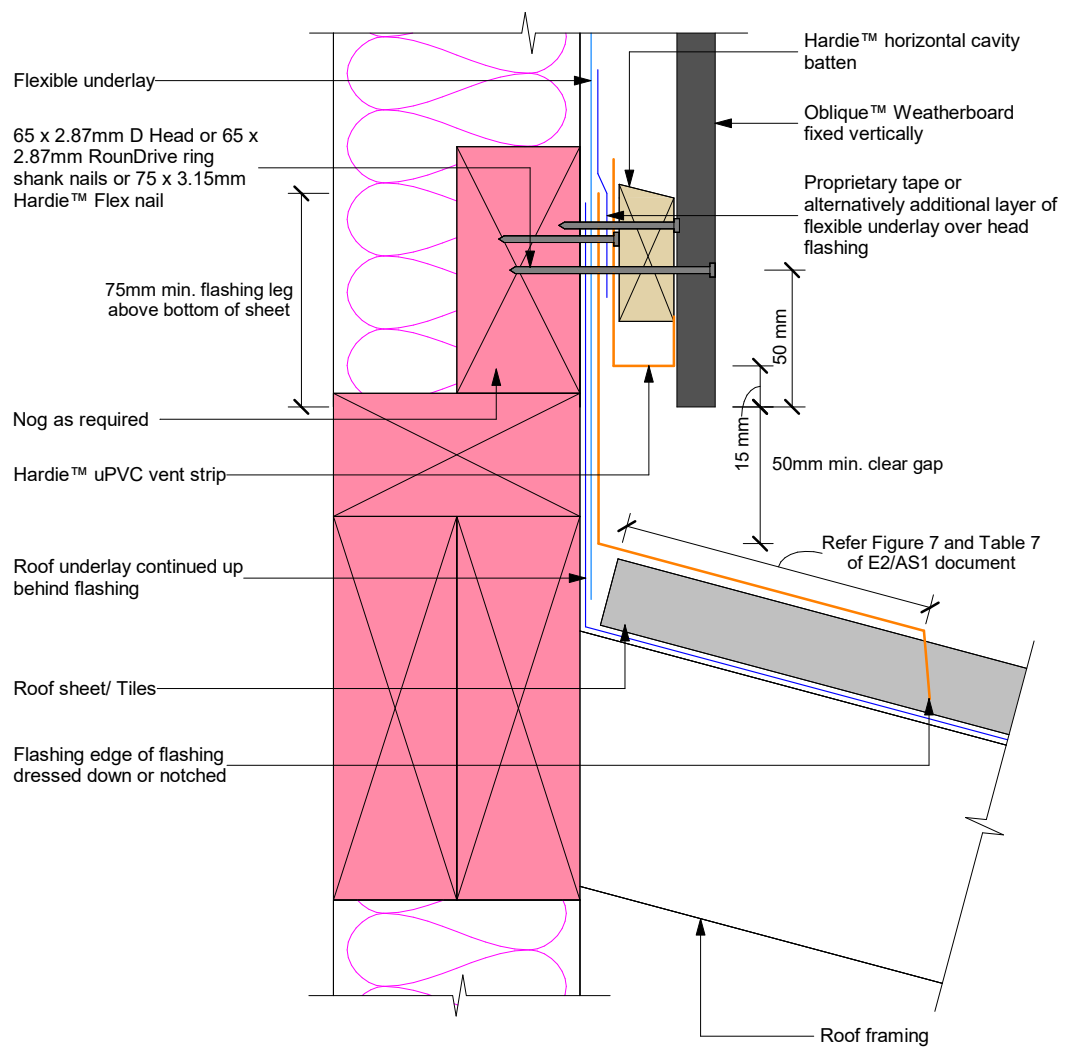


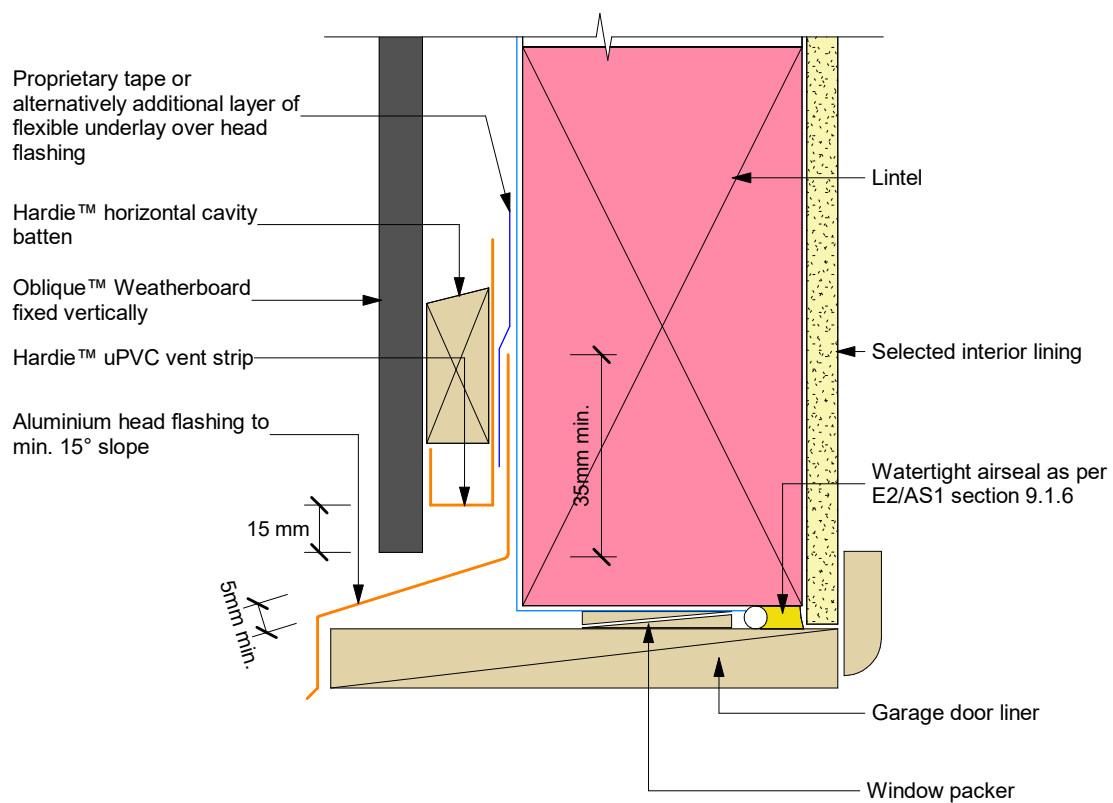
Figure 35: Apron flashing detail



Notes:

- When 50 year durability for flashing is required refer to Table 20 NZBC E2/AS1 document
- Site cut edges to be primed

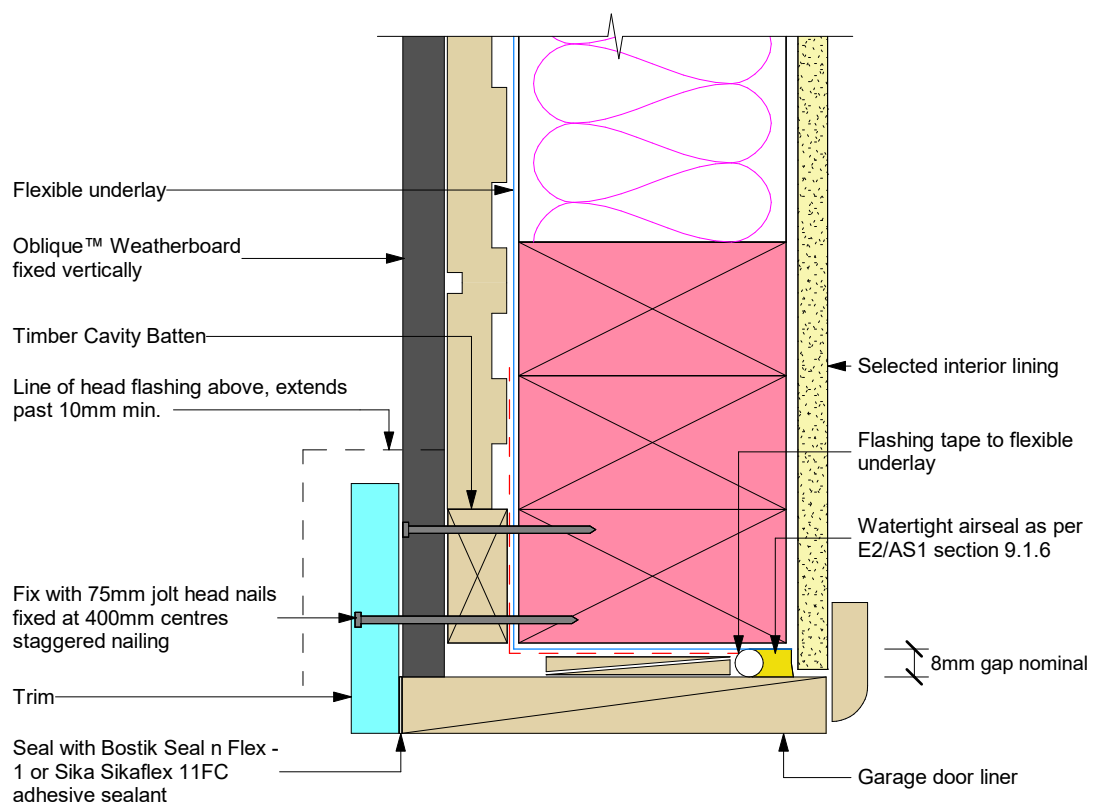
Figure 36: Garage door head



Note:

- Sealant must be applied between head flashing and liner in VH and EH wind zones and SED wind pressures
- Site cut edges to be primed

Figure 37: Garage door jamb



Note: Site cut edges to be primed

Figure 38: Framing setout building height over 10m

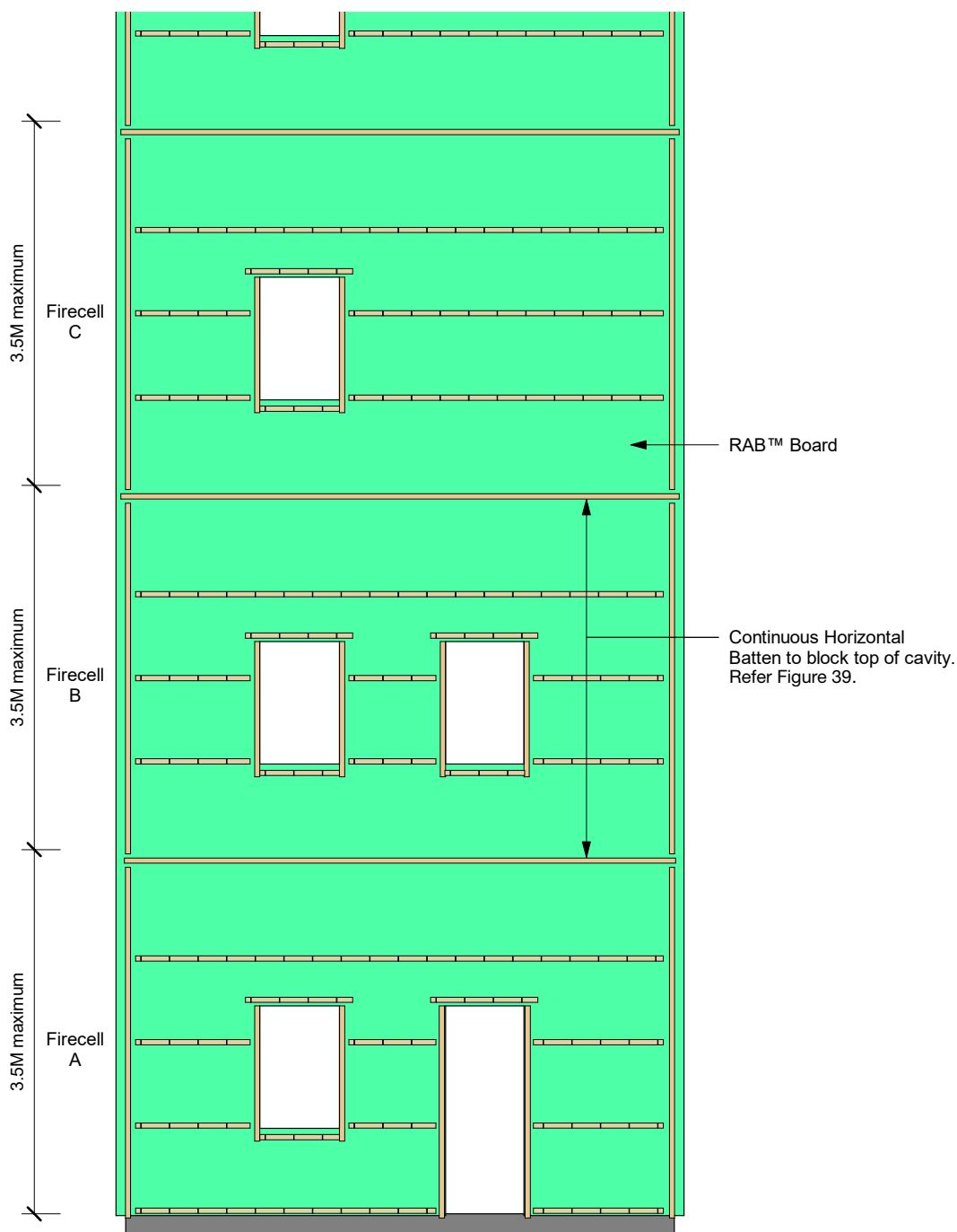
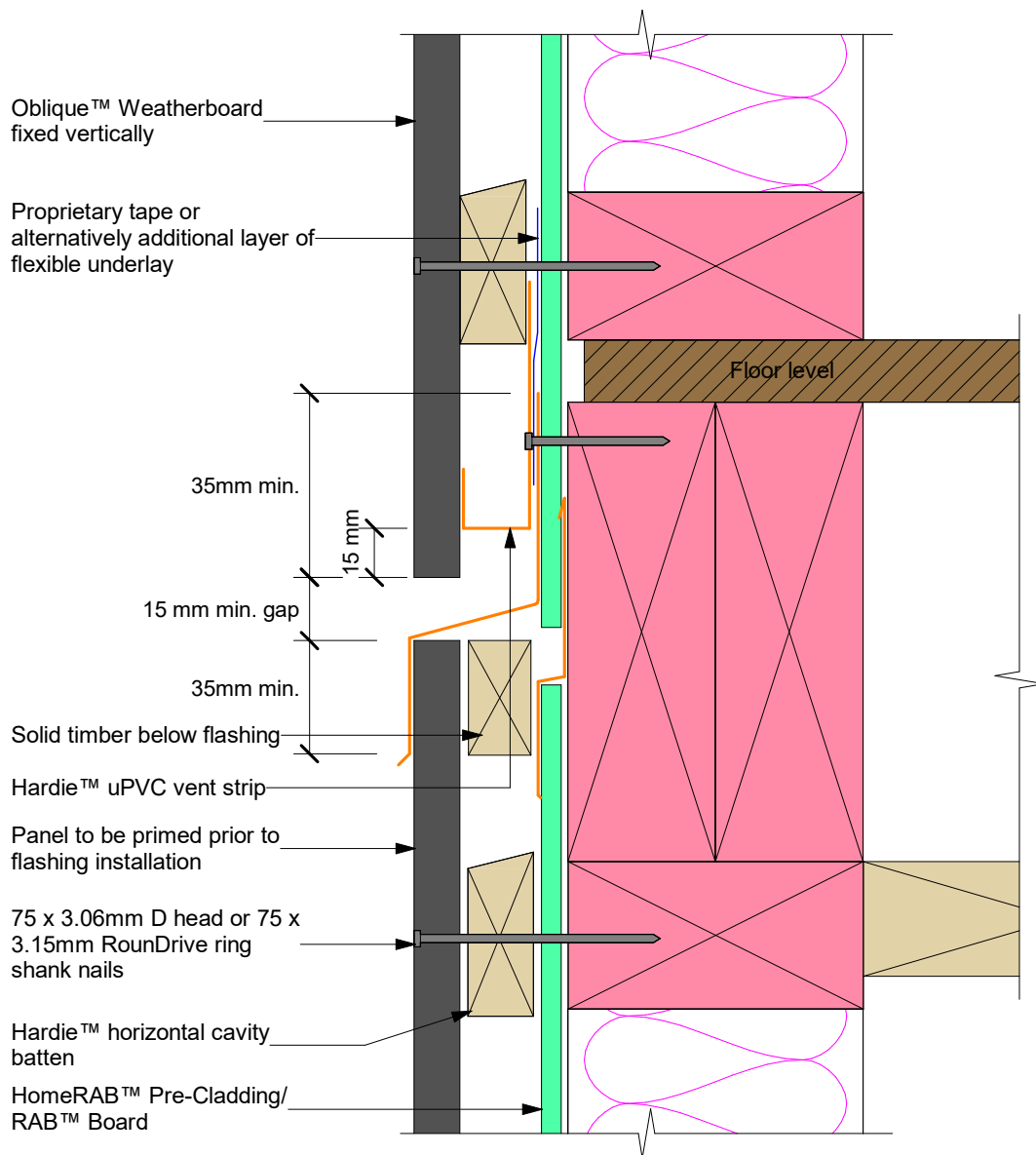


Figure 39: Horizontal flashed joint at IT floor



Note:

- Check architect's plans for the type of flashing to be used
- Cut edges need to be primed
- The flashing to be placed in the centre of the floor joists. Do not fix timber cavity battens or cladding into floor joists

Notes

Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Oblique™ Weatherboard (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. Oblique™ Weatherboard has been appraised by BRANZ as an alternative solution and found to meet the required provisions of the NZBC when installed in accordance with the relevant Oblique™ Weatherboard Technical Specification. 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.





PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System



CERTIFICATE: CMNZ 30147
Version No: RevA

3	DESCRIPTION OF BUILDING METHOD OR PRODUCT										
	Oblique™ Weatherboard Cladding is a cavity-based fibre cement weatherboard wall cladding system. Oblique™ Weatherboard Cladding consists of Oblique™ Weatherboard, which is a 14mm profile fibre cement weatherboard, fixed horizontally or vertically over battens to form a nominal 20 mm cavity. Proprietary ventilated timber battens are used in the vertical application. The cladding is finished with a latex paint system. The cladding system incorporates a primary and secondary means of weather resistance (first and second lines of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity. The cavity allows for any occasional ingress of water that may get past the external skin to drain to the exterior of the building, and any remaining moisture to dry by evaporation.										
4	INTENDED USE OF BUILDING METHOD OR PRODUCT										
	The system is designed to be used as part of an external cladding system on timber framed building.										
5	NEW ZEALAND BUILDING CODE PROVISIONS										
	The system if designed, used, installed and maintained in accordance with this certificate will meet the following provisions of the NZBC: <table><tr><td>Clause B1 STRUCTURE:</td><td>Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).</td></tr><tr><td>Clause B2 DURABILITY:</td><td>Performance B2.3.1(b) 15 years and B2.3.2.</td></tr><tr><td>Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:</td><td>Performance C3.5, C3.7</td></tr><tr><td>Clause E2 EXTERNAL MOISTURE:</td><td>Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7</td></tr><tr><td>Clause F2 HAZARDOUS BUILDING MATERIALS:</td><td>Performance F2.3.1.</td></tr></table>	Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).	Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2.	Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:	Performance C3.5, C3.7	Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7	Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1.
Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).										
Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2.										
Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:	Performance C3.5, C3.7										
Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7										
Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1.										

1	CERTIFICATE HOLDER DETAILS
	James Hardie New Zealand Limited Trading as James Hardie 1 O'Rorke Road, Penrose , Auckland 1061, New Zealand, TechnicalTeam@jameshardie.co.nz Tel: 0800 808 868, www.jameshardie.co.nz

ORIGINAL ISSUE DATE	VERSION DATE	RECERTIFICATION
17/10/2022	17/10/2022	17/10/2025
8 SIGNATURE		
Herve Michoux, Global Mark Managing Director		

2	PRODUCT CERTIFICATION BODY
	Global-Mark Pty Ltd 57 Willis Street, Wellington, 6011 customer.service@global-mark.co.nz +64 9 889 0622 www.global-mark.co.nz
	The complaints process for this certificate can be found here: https://www.global-mark.com.au/?s=complaint



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The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2

PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System

6 CONDITIONS AND LIMITATIONS OF USE

1. The system is certified:
 - a. as a cavity fixed external wall cladding for buildings:
 - i. within the scope limitations of the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 1.1,
 - ii. with a risk score of up to 20, calculated in accordance with the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 2,
 - iii. situated in in NZS 3604:2011 Wind Zones up to, and including Extra High, and
 - b. as a cavity fixed external wall cladding for buildings specifically engineering designed (SED):
 - i. up to 25m in height, and
 - ii. with an inter-storey drift of span/180 maximum, and
 - iii. the design ultimate limit state (ULS) differential wind pressure does not exceed 3.2 kPa; and
 - iv. with the stud and batten spacing no more than 600mm centres,
 - c. located:
 - i. in all exposure zones (except microclimates) as defined in NZS3604:2011 section 4.2, and
 - ii. anywhere in relation to the relevant boundary for Importance Levels 1 to 4 buildings within the scope of:
 1. C/AS1, amendment 5, 5 November 2020 paragraph 1.1.1 or
 2. C/AS2, amendment 2, 5 November 2020 paragraph 1.1.1
2. The system shall be specified, installed, inspected and maintained in accordance with the following sets of documents collectively referenced as the Applicable Technical Specification to the extent that their scope covers that for this Certificate:
 - a. For the Horizontal applications,
 - i. Oblique™ Weatherboard 14mm Horizontal Installation – Technical specification, October 2022, and
 - ii. Fire & Acoustic Design Manual (November 2020) by James Hardie section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGO30h and JHETGO60h. These details have only been assessed and certified with respect to external fire spread via Oblique™ Weatherboard Cladding. For walls located within 1.0 m of a relevant boundary, Oblique™ Weatherboard Cladding may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate
 - b. For the Vertical Application,
 - i. Oblique™ Weatherboard 14mm Vertical Installation – Technical specification, October 2022, and
 - ii. Fire & Acoustic Design Manual (November 2020) by James Hardie section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGO30v and JHETGO60v. These details have only been assessed and certified with respect to external fire spread via Oblique™ Weatherboard Cladding. For walls located within 1.0 m of a relevant boundary, Oblique™ Weatherboard Cladding may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate

(Note: Provisions within the documents above related to the use of the system with steel-frame construction are outside the scope of this certification).



PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System



3. In wind zones greater than Very High a rigid air barrier which complies with Table 23 of E2/AS1 shall be used. In Buildings exceeding 10 m in height RAB™ Board must be used including horizontal control joints in accordance with the requirements of the Codemark certificate for RAB™ Board. (Refer to GM-CM30130)
4. The system is certified for use:
 - a. with the ancillary components as described in this certificate,
 - b. with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. Only joinery compliant with the requirements of NZS 4211:2008 including amendment 1 for the relevant Wind Zone or wind pressure shall be used.
5. Oblique™ Weatherboard Cladding shall only be installed horizontally or vertically on vertical surfaces.
6. All exposed faces, including top edges at sills and all bottom edges of Oblique™ Weatherboard Cladding Weatherboards and fibre cement ancillary components shall be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730
7. E2.3.5 and E2.3.6 compliance is limited to cavities created between the internal surface of the weatherboards and the underlay or RAB™ Board's.

7 HEALTH AND SAFETY INFORMATION

Standard industry safety practices and manufacturer safety requirement as detailed in the technical literature including the applicable SDS must be observed at all time. Please refer to James Hardie SDS Fibre Cement Products June 2022

9 BASIS FOR CERTIFICATION

The certification decision is based on independent technical review(s) of test report(s), engineering opinion(s) and other documented evidence(s), factory audit(s) and site review(s)

Code Clause	Compliance pathway	Evidence
B1 STRUCTURE	Alternative solution -Expert judgement	001, 012, 013, 014, 015, 016, 017, 018, 019, 020, 021, 022,, 024, 025 and 026
B2 DURABILITY	Alternative solution -Expert judgement	001, 023, 025 and 026
C3 FIRE AFFECTING AREAS BEYOND THE SOURCE	Alternative solution -Expert judgement	001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 025, 026and 027
E2 EXTERNAL MOISTURE	Alternative solution -Expert judgement	001, 009, 012, 013, 014, 015, 016, 017, 018, 019, 020, 021, 022, 025 and 026
F2 HAZARDOUS BUILDING MATERIALS	Alternative solution -Expert judgement	001, 021, 025, 026 and 028

10 SUPPORTING DOCUMENTATION FOR CERTIFICATION

Ref	Author	Title	Date and/or revision
001	GLOBAL-MARK	Codemark Certification GM-CM30130 HomeRAB™ Pre-Cladding and RAB™ Board by JAMES HARDIE	Rev A
002 *	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH3182 21 November 2002
003 *	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH 2976 15 May 2001



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The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System



004 *	BRANZ	Fire Assessment Report based Cone calorimeter test (BRANZ Project No. FC10254-001).	FSR 4206 Issue2 7 November 2018
005 *	BRANZ	Fire technical Opinion: Technical opinion based on NFPA 285 Compliance with NZBC C/AS2, clause 5.8.2 (b) and C/VM2 Part A (a).	FC12172-001 1 November 2019
006 *	BRANZ	Fire Assessment Report Review of James Hardie Fire and Acoustic Manual	FAR 4620 – 04 November 2016
007 *	BRANZ	Fire technical Opinion: Fire resistance of James Hardie Wall Systems with Service Penetrations	FC12040-004 -03 December2019
008 *	BRANZ	Technical Assessment “Fire Resistance of External Wall and Soffit” _ Various JH Products	FAR 2597- 5th October 2005
009 *	BRANZ	E2 Weathertightness Opinion for the Appraisal of Linea Oblique Weatherboard (Vertical) Cavity Cladding	TP2355-02, dated 19 November 2015
010 *	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6706.01-121-24 - 20th August 2019
011 *	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6707.01-121-24 - 21st August 2019
012 *	Clarkson Consulting Services	JH NZ_RAB_Weathertightness Assessment_200626_R2.1	August 2022
013 *	James Hardie Building Product	Weathertightness Testing of Residential Façade Fibre Cement Cladding System On Cavity Battens to the requirement of Verification Method E2/VM1	TS061-05, dated 15 February 2006
014 *	James Hardie Building Product	TESTING OF A TITAN RESIDENTIAL FIBRE CEMENT CLAD FAÇADE FOR COMPLIANCE WITH THE REQUIREMENTS OF AS/NZS 4284:1985 “TESTING OF BUILDING FACADES”	TS010-06, dated 14 November 2006
015 *	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS003-13, dated 4 December 2013
016 *	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS022-13, dated 12 November 2013
017 *	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS033-13, dated 8 January 2014
018 *	James Hardie Technical Support group	Weathertightness & Façade System (E2/VM1)	TS009-15, dated 14 October 2015
019 *	James Hardie Technical Support group	Weathertightness & Façade System (E2/VM1)	TS052-11, dated 16 December 2011
020 *	Façade Testing New Zealand Limited,	Testing of James Hardie NZ ExoTec Façade Panel top hat rainscreen façade system in accordance with AS/NZS 4284:2008	FT-R1005, dated May 2017
021 *	Façade Lab Ltd	Testing of James Hardie Linea Oblique vertical weatherboard on rigid wall underlay to E2/VM2 (BRANZ EM7) using tests from AS/NZS 4284:2008 ‘Testing of Building Facades’	20-16 dated 11/12/2020



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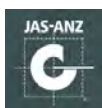


PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System



022*	BRANZ	BRANZ Assessment – Face Load Strength of James Hardie Linea Weatherboard Clad Walls and Variations of Sheet thickness and Nail type (reviews STO483)	STO102/SM30/SJT dated 11 November 2002
023*	BRANZ	Durability Opinion on the Linea Weatherboard System	DA 0220 dated 24/09/2017
024*	BRANZ	Face Loading Testing of Low Density Thick Weatherboard	Report ST483 dated 20 February 2001
025	James Hardie New Zealand Limited	Oblique™ Weatherboard 14mm Horizontal Installation – Technical specification	October 2022
026	James Hardie New Zealand Limited	Oblique™ Weatherboard 14mm Vertical Installation – Technical specification	October 2022
027	James Hardie New Zealand Limited	James Hardie Fire & Acoustic Design Manual. Section 4:16 Control of External Fire Spread, figures No's. 1 to 9 8 and 12 to 20, specifically details JHETGO30h, JHETGO30v, JHETGO60h and JHETGO60vI	November 2020
028	James Hardie New Zealand Limited	LQA8N - SAFETY DATA SHEET- JAMES HARDIE FIBRE CEMENT SHEETS PRODUCTS	Version No.: 2.0 ISSUED Date : 22/06/2022
* These documents were provided commercial in confidence and are not publicly available			



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11 SUPPORTING INFORMATION ABOUT DESCRIPTION (OPTIONAL)

The Oblique™ Weatherboard Cladding panels are pre-primed with an acrylic primer on the front face and edges. The Oblique™ Weatherboard Cladding panels are 14 mm thick and are available 200 and 300 mm wide. The boards are supplied 2750 and 4200 mm long. Oblique™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a rusticated profile is machined on the top edge of the front face, and a rebated lap is machined on the bottom of the back face of the weatherboard. The front edge at the bottom of the board and the board ends are finished square. Oblique™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

James Hardie supplies the following ancillary components:

- For horizontal and vertical applications
 - Rigid wall underlay – HomeRAB™ Pre-Cladding and RAB™ Board
 - Hardie™ Axent™ Trim - Hardie™ Axent™ Trim is a 19mm thick, pre-primed fibre cement product available in 3000 mm by 70 mm or 89 mm
 - Hardie™ 14mm Aluminium Trimline Joint Flashing - Aluminium extrusion used behind cladding at horizontal joints available in 3000 mm long
 - Trimline External Corner Jointer - Joins Trimline Joint Flashing at an external corner
 - Trimline Internal Corner Jointer - Joins Trimline Joint Flashing at an internal corner
 - Weatherboard Internal 'W' Corner - Anodised aluminium extrusion used to create internal corners available in 2700 mm and 4000 mm long.
 - Hardie™ 14mm Aluminium Weatherboard Internal Corner - Anodised aluminium extrusion used to create internal corners available in 3000 mm long.
 - Hardie™ 14mm Aluminium Weatherboard External Box Corner - Anodised aluminium extrusion used to create external corners available in 2700 mm and 4000 mm long.
 - Cavity vent strip – Hardie™ 28 mm aluminium cavity closure or Hardie™ uPVC vent strip, available in 3000 mm lengths.
 - Oblique 14mm Plug - To fill recess in Oblique™ Weatherboard 14mm
- For the horizontal applications
 - Trimline Horizontal Jointer - A jointer to cover the butt joint of Oblique Trimline Joint Flashing available in 100 mm long
 - Hardie™ 14mm Aluminium Trimline Joint Flashing - Aluminium extrusion used behind cladding at horizontal joints available in 3000 mm long
 - Hardie™ 14mm Aluminium Jamb Flashing 3000mm - Aluminium moulding used beside window opening to end butt the Oblique™ Weatherboard available in 3000 mm long.
- For the vertical applications
 - Hardie™ horizontal cavity battens – 45 x 20 mm thick Radiata pine batten treated to Hazard Class H3.1. The top edge is bevelled with an 18° slope. The back face is grooved with 22 mm wide x 5 mm deep rebates at 50 mm centres, and the front face is grooved with 6 mm wide x 6 mm deep rebates at 150 mm centres. The grooves are offset on each face.
 - Hardie™ 14mm Aluminium Internal Corner 3000mm - Anodised aluminium extrusion used to create internal corners available in 3000 mm long.

Other components not supplied by James Hardie but meet the following requirements

- For the horizontal and vertical applications
 - Flexible wall underlay – building paper complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid Codemark Certification for use as wall underlays
 - Flexible wall underlay support – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible wall underlay in place and preventing bulging of the bulk insulation into the drainage cavity. (Note: mesh and wire galvanising must comply with AS/NZS 4534.)



PRODUCT CERTIFICATE

Oblique™ Weatherboard by James Hardie Cavity Cladding System



- Flexible sill, head and jamb flashing tape - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid Codemark Certification for use around window and door joinery openings
- Flexible window opening flashing tape - A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this manual for more information.
- Rigid air barrier vertical joint sealing tape - The tape to be used to seal HomeRAB™ Pre-Cladding/RAB™ Board vertical joints.
- Head flashing - Required over window heads to be supplied by window installer. Material must comply with Table 20 and 21 of E2/AS1.
- Exterior grade filler
- Cavity batten fixings - 40 x 2.8 mm flat head hot-dip galvanised nails.
- Oblique™ Weatherboard fixings (with flexible wall underlays) - 65 x 2.87 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails.
- Oblique™ Weatherboard fixings (with rigid wall underlays up to 10 mm thick) - 75 x 3.06 mm D-head or RounDrive hot-dip galvanised or stainless steel ring shank nails (Note: Stainless steel fixings must be Grade 304/316 and hot-dip galvanising must comply with AS/NZS 4680).
- Joinery head flashings - extruded or folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- Flexible sealant - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid Codemark Certification for use as a weather sealing sealant for exterior use.
- For the horizontal applications
 - Cavity battens - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
 - Timber trim and moulding for use around windows and door. Timber trim and moulding must be finished in accordance with NZBC.
 - Timber trim and moulding fixings - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolt head nails and stainless steel ring shank jolt head nail.
 - Planted sill and scribes - timber treated to Hazard Class H3.1, pre-primed before installation. Window and door trim cavity air seal - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid Codemark Certification suitable for use around window, door and other wall penetration openings.
- For the vertical applications
 - Window and door trim cavity air seal - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid Codemark Certification suitable for use around window, door and other wall penetration openings.

12 SUPPORTING INFORMATION ABOUT INTENDED USE (OPTIONAL)

Nil

13 SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE (OPTIONAL)

Oblique™ Weatherboard Cladding can be used to provide fire resistance rated construction, but this aspect has not been assessed and is outside the scope of this certificate.

End of document



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