JamesHardie™

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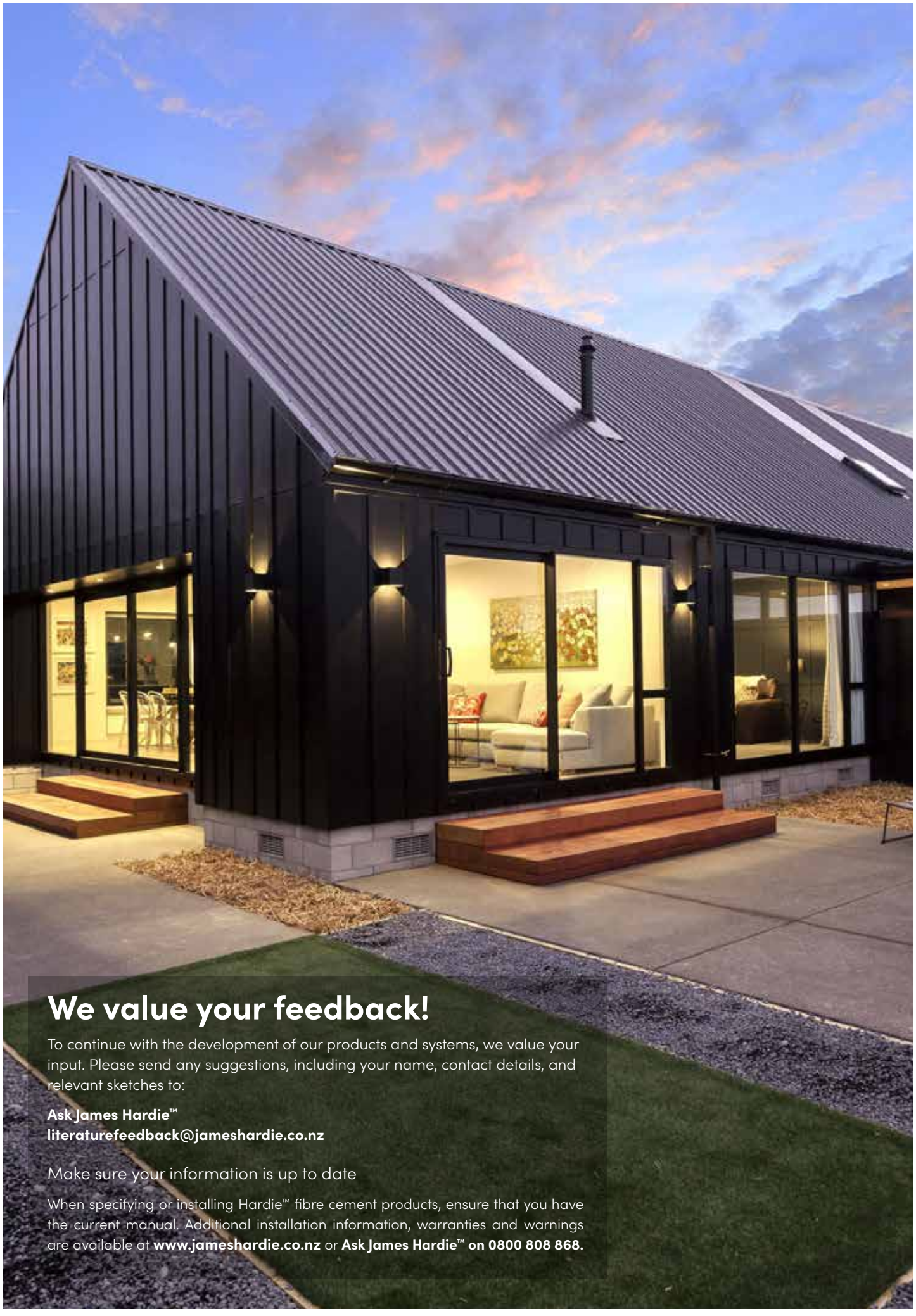
Hardie™ Flex Sheet

Technical Specification

October 2021 New Zealand



We value your feedback!

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

Ask James Hardie™
literaturefeedback@jameshardie.co.nz

Make sure your information is up to date

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

Contents

1 Application and scope

1.1 Application

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

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

If you are a specifier

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

If you are an installer

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

Make sure your information is up to date

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

1.2 Scope

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

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

1.3 Details

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

1.4 Specific Design

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

2 Design

2.1 Compliance

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

2.2 Responsibility

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

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

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

2.3 Site and Foundation

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

2.4 Clearances

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

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

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

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

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

2.5 Moisture Management

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

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

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

2.6 Structure

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

2.7 Wind Loading

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

2.8 Structural Bracing

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

2.9 Fire Rated Walls

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

2.10 Energy Efficiency

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

3 Framing

3.1 General

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

3.2 Dimensions

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

3.3 Timber Grade

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

3.4 Durability

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

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

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

3.5 Frame Construction

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

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

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

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

3.5.1 Direct Fix Construction Method

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

For direct fixed construction method the following framing is required:

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

3.5.2 Cavity Construction Method

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

For cavity construction method the following framing is required:

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

3.6 Tolerances

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

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

3.7 Curved Walls

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

4 Preparation

4.1 Flexible Underlay/HomeRAB™ Pre-Cladding

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

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

4.2 Rigid Air Barrier

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

4.3 Vent Strip

The Hardie™ uPVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Hardie™ uPVC vent strip has an opening area of 1000mm^2/m length.

4.4 Cavity Battens

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

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

Cavity battens must comply with following requirements:

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

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

No intermediate batten between studs is required:

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

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

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

4.5 Flashings

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

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

5 Fixing

5.1 General

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

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

5.2 Fastener Durability

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

Table 1

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

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

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

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

5.3 Fastener — size and layout

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

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

Table 2

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

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

5.4 Gun Nailing

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

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

5.5 Sheet layout

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

6 Jointing

6.1 General

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

6.2 Vertical Joint

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

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

6.3 Internal Corner and External Corner

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

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

6.4 Horizontal Joint

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

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

7 Finishing

7.1 Preparation

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

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

7.2 Sealants

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

7.3 Coating

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

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

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

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

8 Care & Maintenance

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

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

9 Product Information

9.1 Manufacturing and Classification

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

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

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

9.2 Product Mass

Hardie™ Flex Sheets are manufactured in 6.0 mm thick sheet with a Mass of 8.6 kg/m^2 at EMC.

Hardie™ Flex Sheets are defined as a Light Weight Wall Cladding (not exceeding 30kg/m^2) as per NZS 3604.

9.3 Sheet Sizes

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

Table 3

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

9.4 Durability

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

9.4.1 Resistance to moisture/rotting

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

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

9.4.2 Fire performance

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

9.4.3 Alpine regions

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

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

10 Safe Working Practices

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

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

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

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

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

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

Crystalline Silica is

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

Why is Crystalline Silica a health hazard?

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

When is Crystalline Silica a health hazard?

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

Avoid breathing in crystalline silica dust

Safe working practices

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

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

Best

- Hardie™ Knife
- Hand guillotine
- Fibreshear

Better

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

When cutting outdoors

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

When cutting indoors

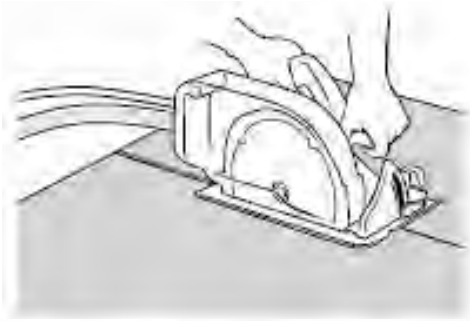
✕ Never cut using a circular saw indoors

✓ Position cutting station in a well ventilated area

✓ Cut ONLY using a Hardie™ Knife, hand guillotine or fibreshears (manual, electric or pneumatic)

✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

Working instructions



Hardie™ Blade Saw Blade

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

Hole forming

For smooth clean cut circular holes:

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

For irregular holes:

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

10.1 Storage and delivery

Keeping products and people safe

Off loading

✓ Hardie™ fibre cement products should be off-loaded carefully by hand or by forklift

✓ Hardie™ fibre cement products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

Hardie™ fibre cement products should be stored:

✓ In their original packaging

✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry

✓ Off the ground – either on a pallet or adequately supported on timber or other spacers

✓ Flat so as to minimise bending

Hardie™ fibre cement products must not be stored:

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

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

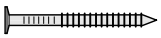
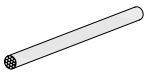
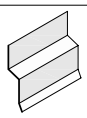
10.2 Tips for safe and easy handling of Hardie™ Flex Sheet

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

11 Accessories

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

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

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

12 Details

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

Table 4

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

Figure 1: Direct fix framing

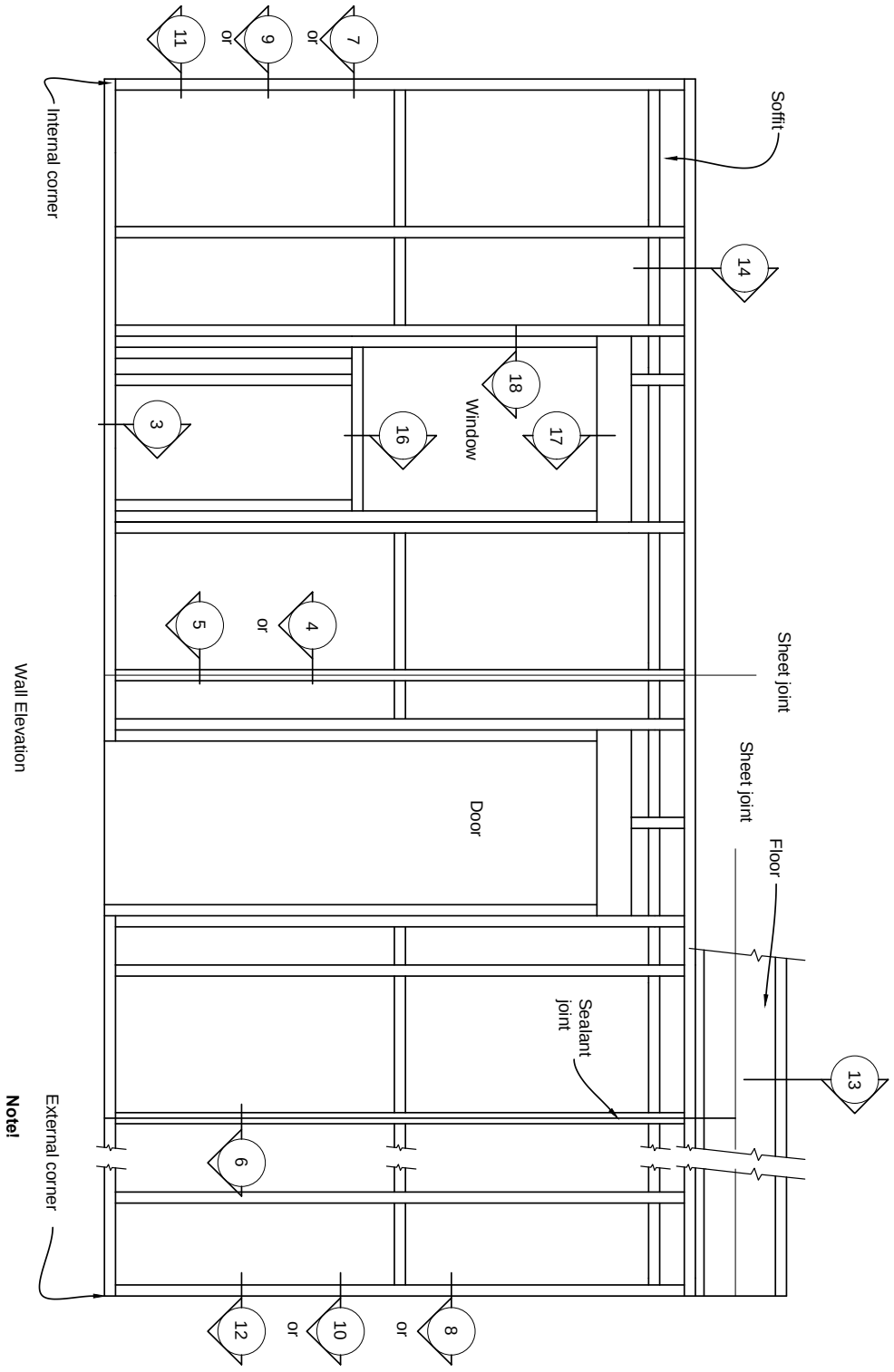
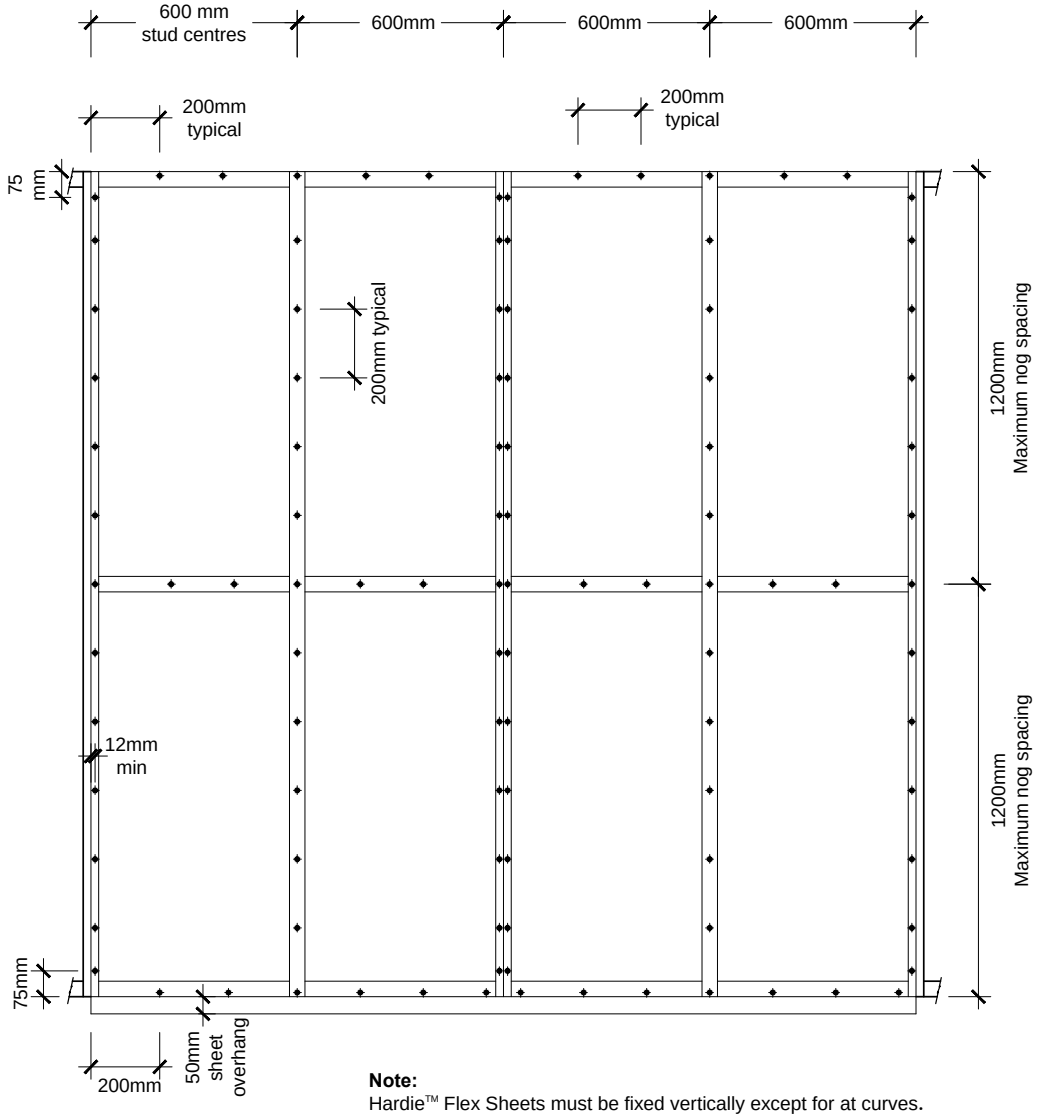


Figure 2: Direct fix sheet fixing



Note:
Hardie™ Flex Sheets must be fixed vertically except for at curves.

Figure 3: Direct fix concrete foundation detail

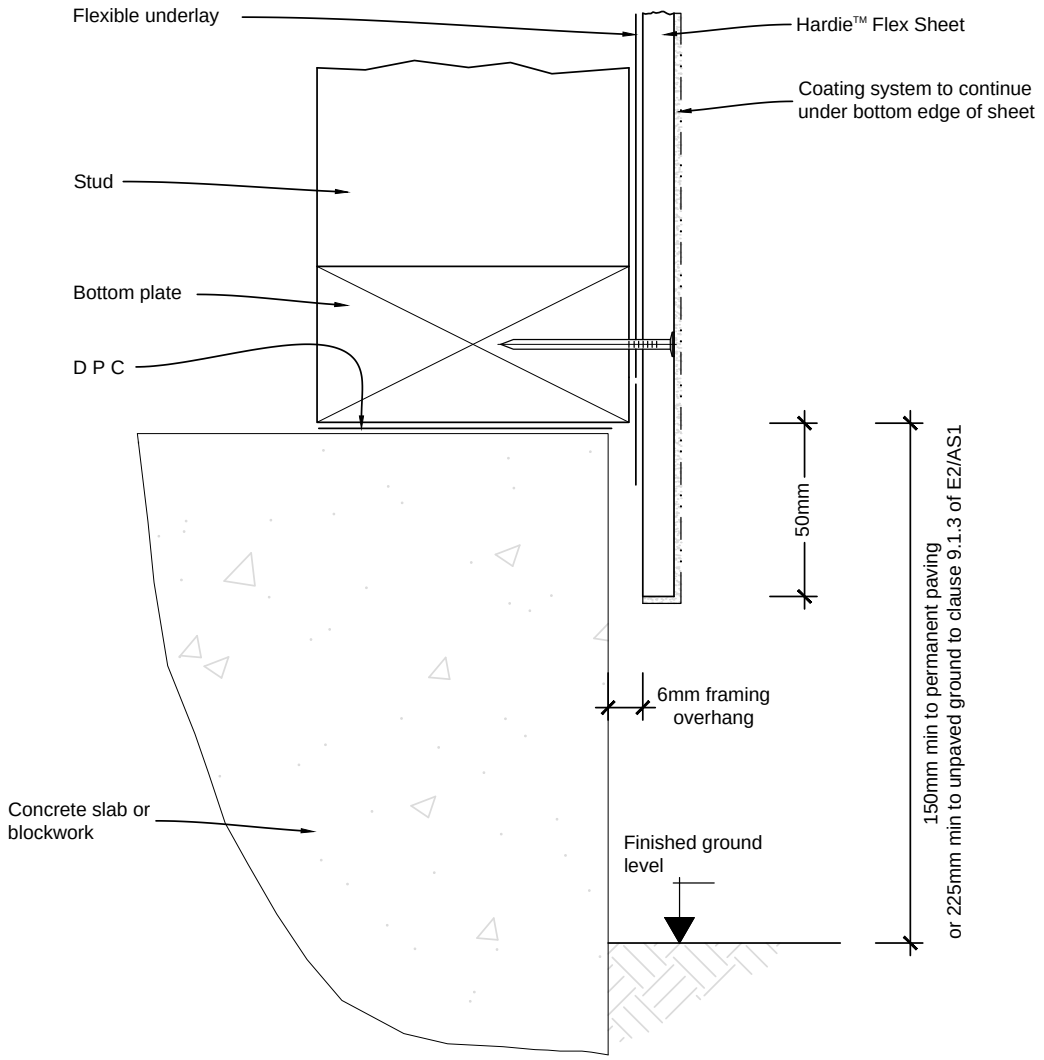
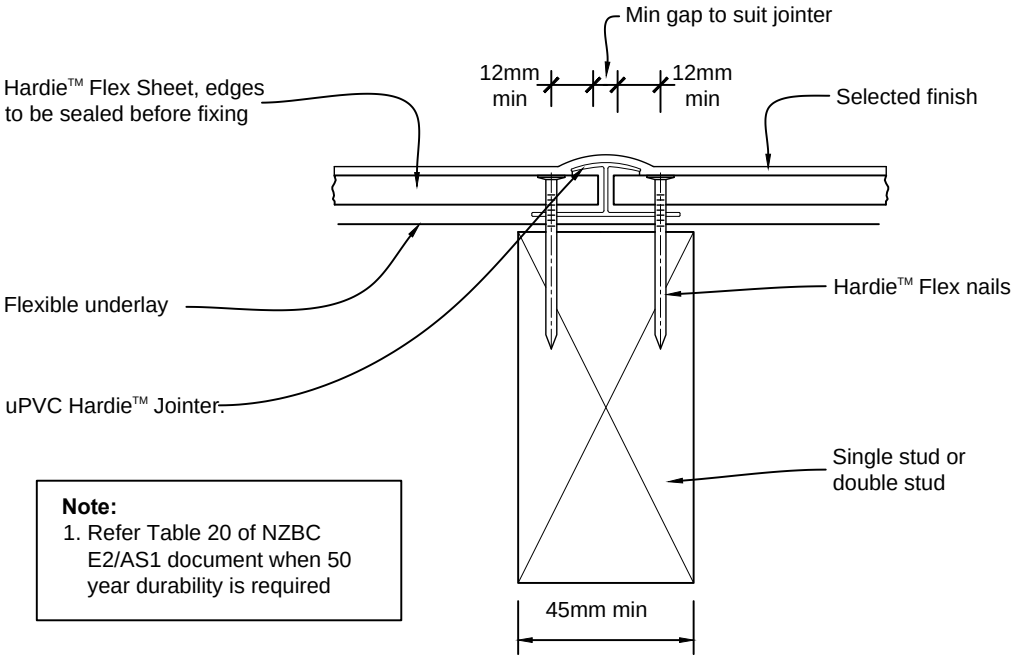
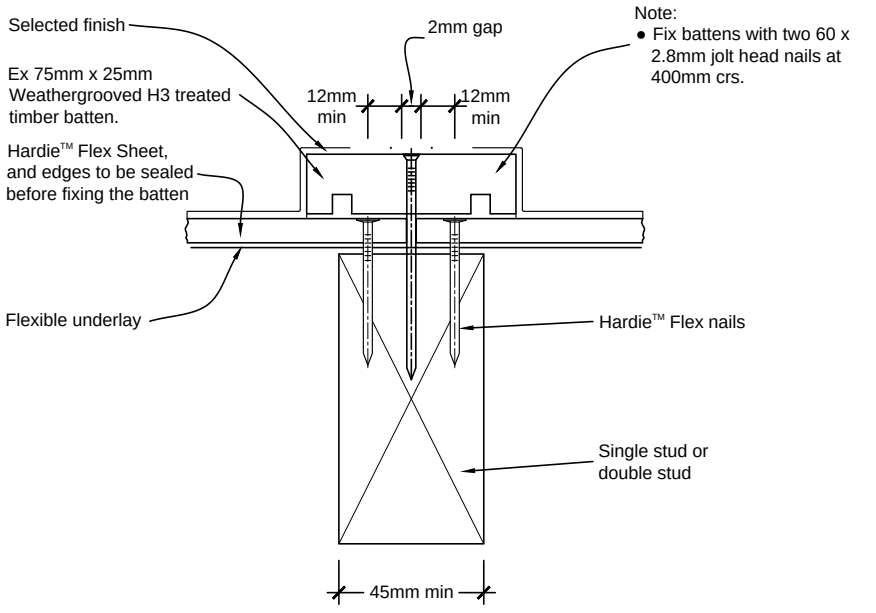


Figure 4: Direct fix vertical uPVC joint



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

Figure 5: Direct fix vertical timber batten joint



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

Figure 6: Direct fix vertical sealant joint

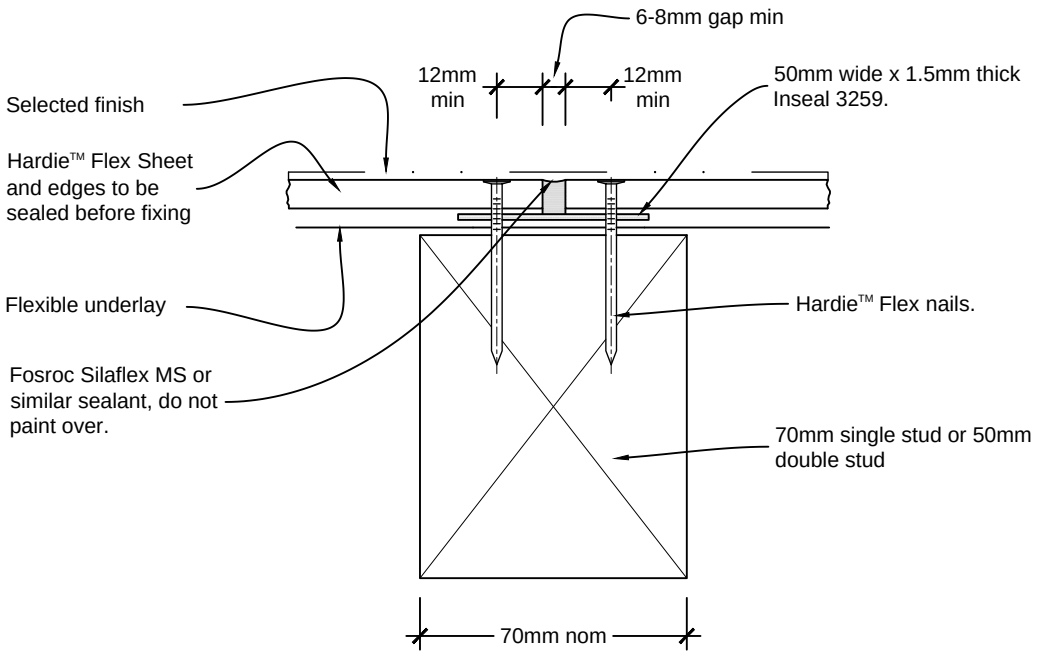
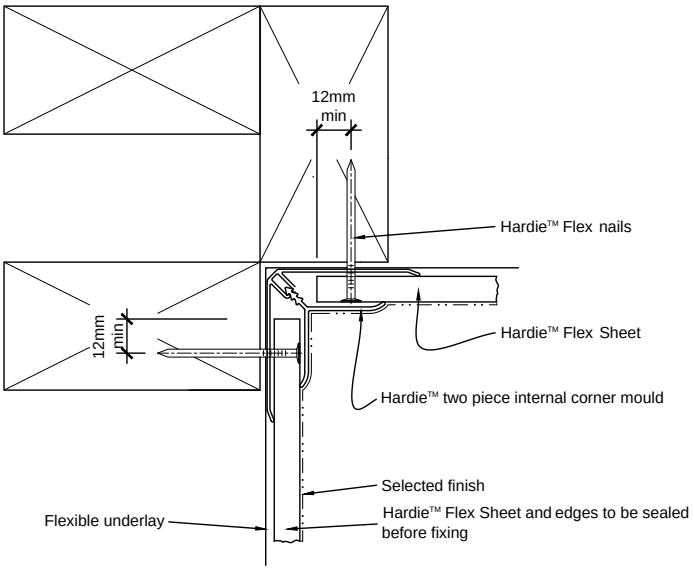
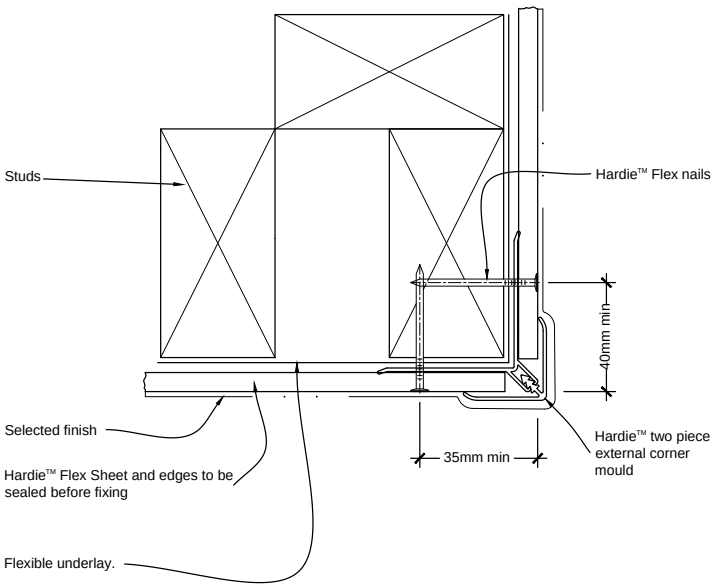


Figure 7: Direct fix internal uPVC corner joint



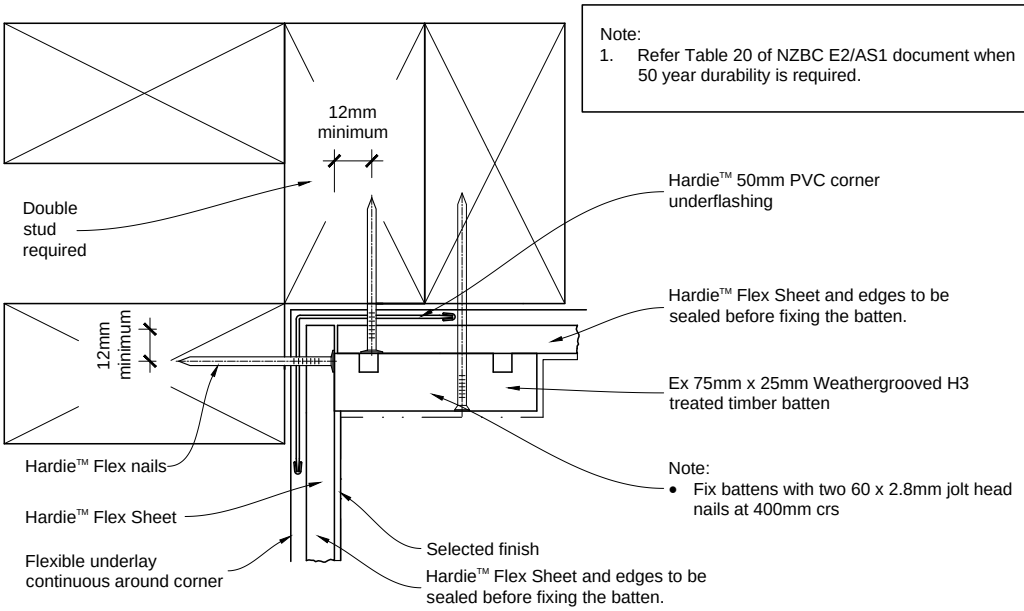
Note:
1. Refer Table 20 of NZBC E2/AS1 document when 50 year durability is required.

Figure 8: Direct fix external uPVC corner joint



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

Figure 9: Direct fix internal timber batten corner



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

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

Figure 10: Direct fix external timber batten corner

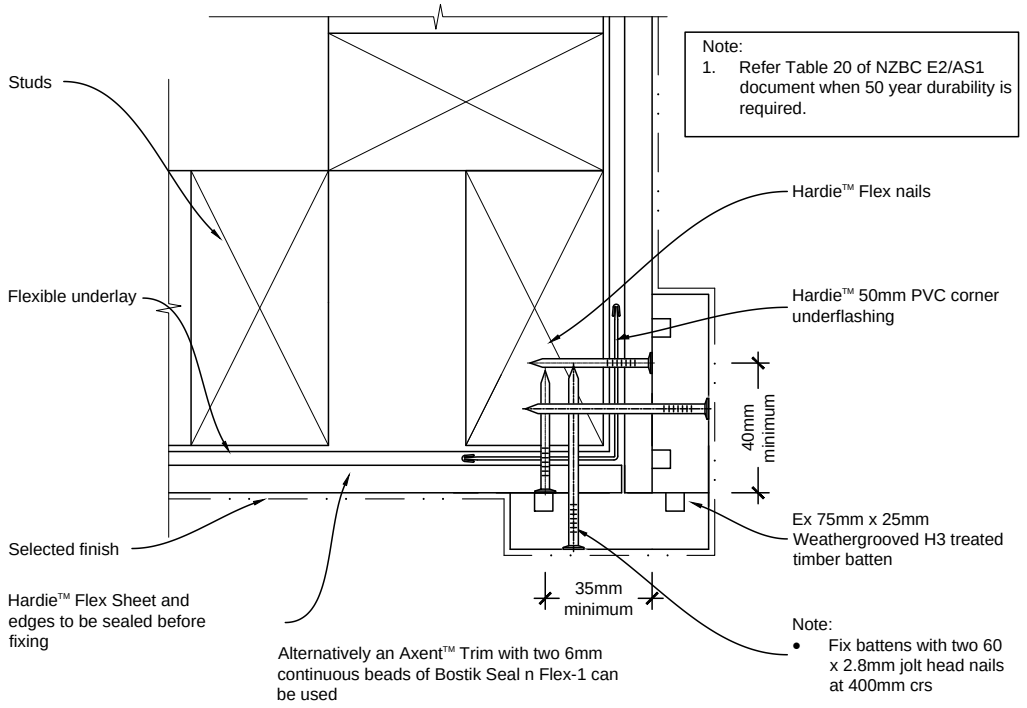


Figure 11: Direct fix internal sealant joint corner

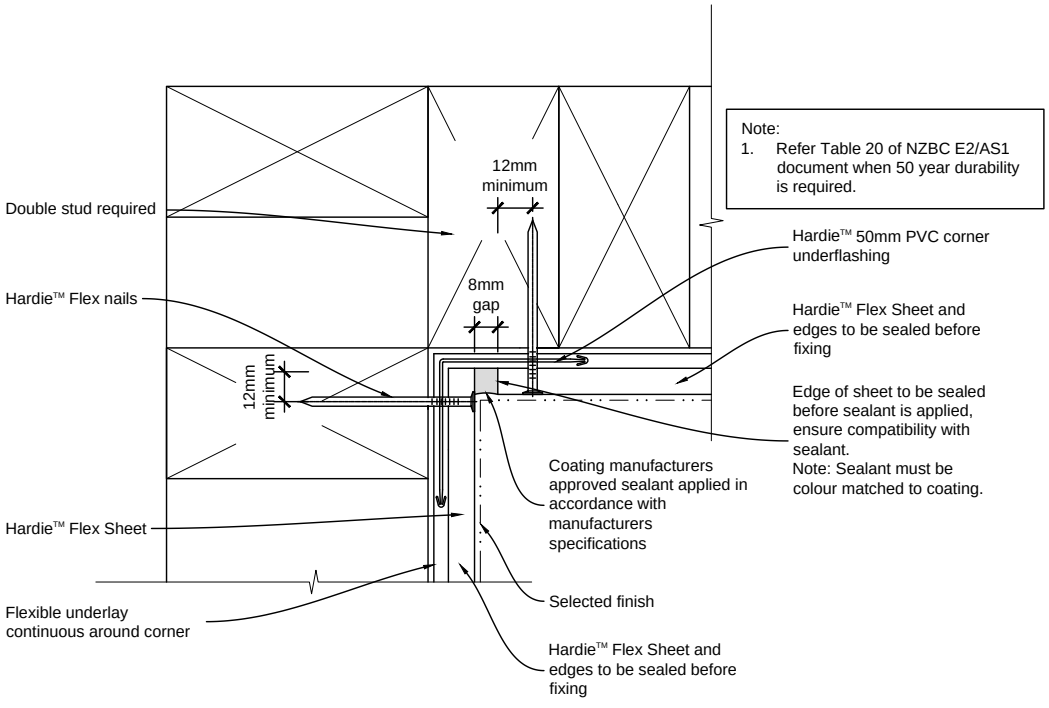


Figure 12: Direct fix external sealant joint corner

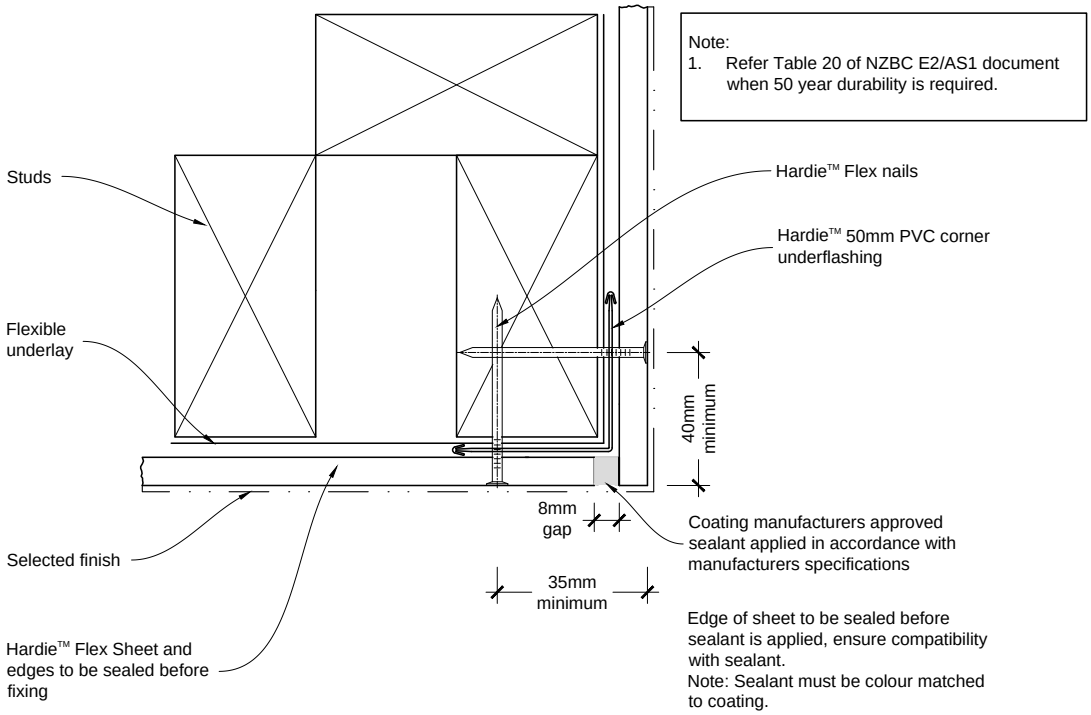
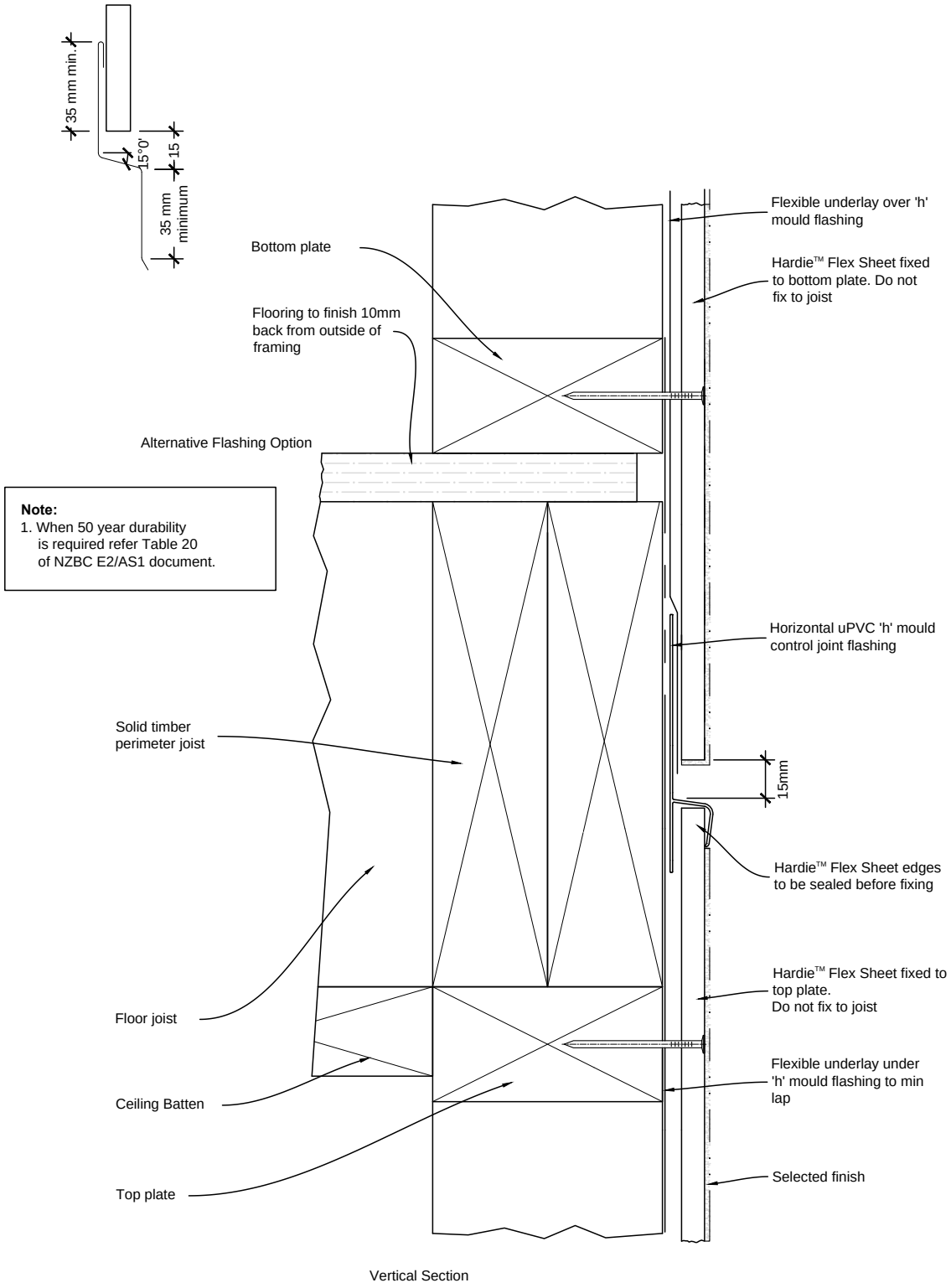


Figure 13: Direct fix horizontal control joint



Vertical Section

Figure 14: Direct fix soffit detail

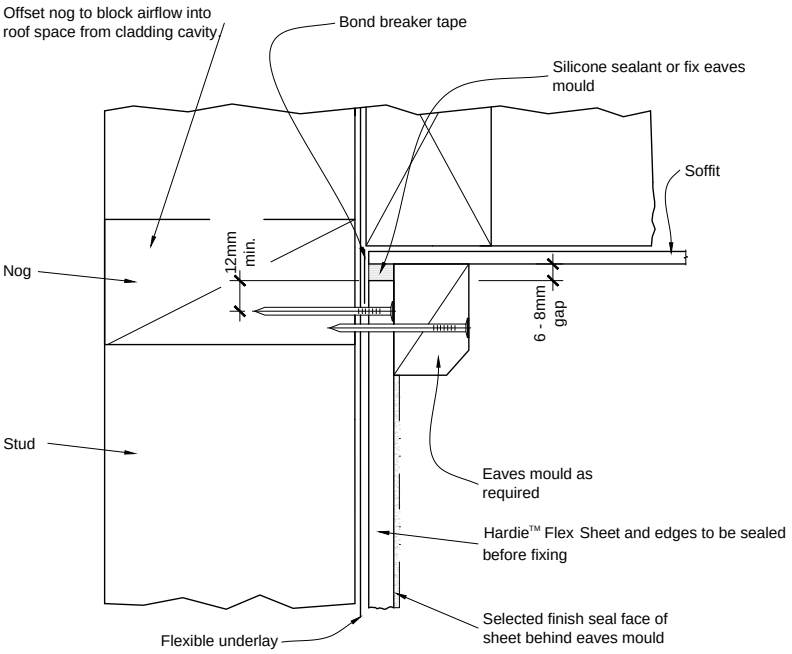


Figure 15: 'h' mould jointer

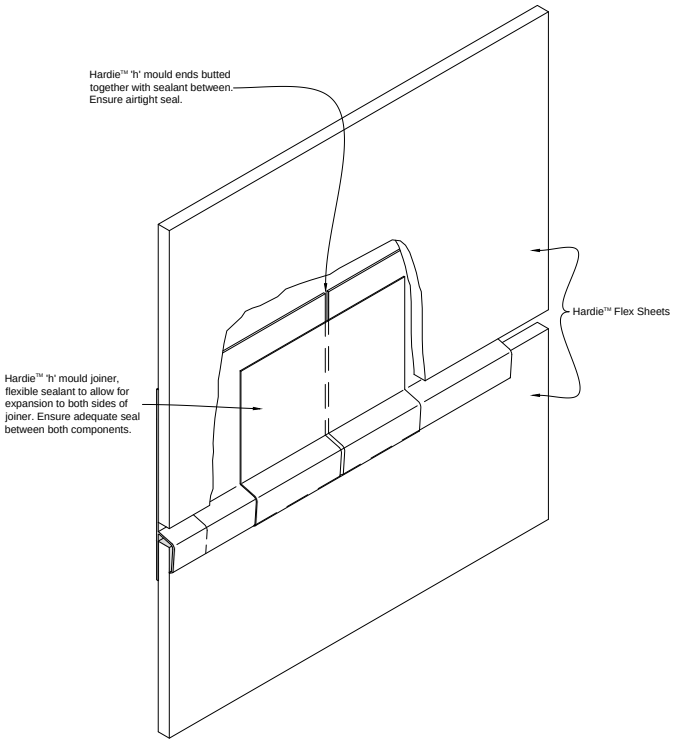
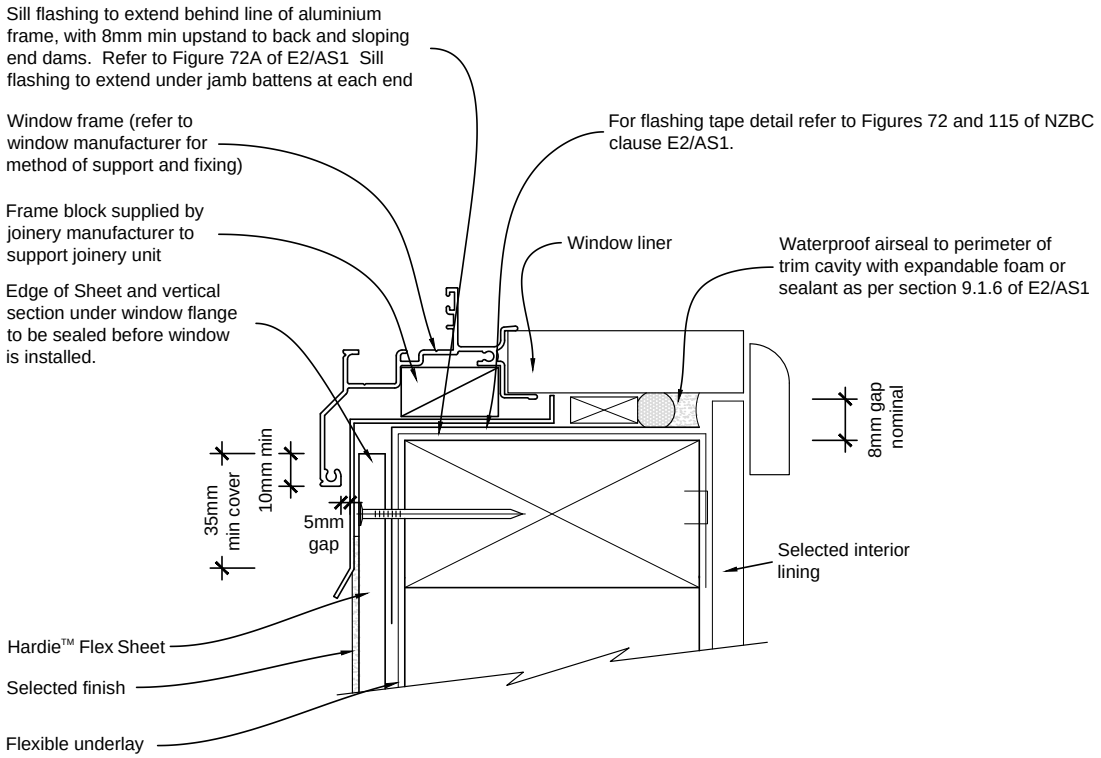


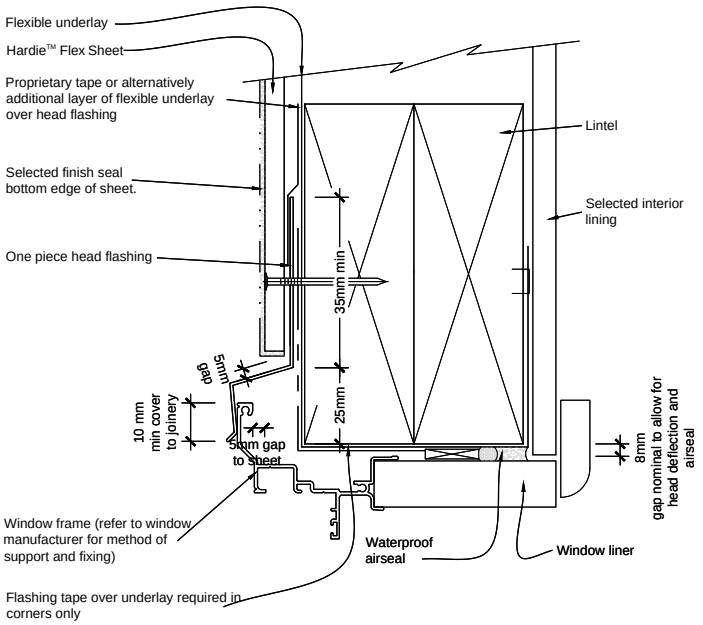
Figure 16: Direct fix window sill



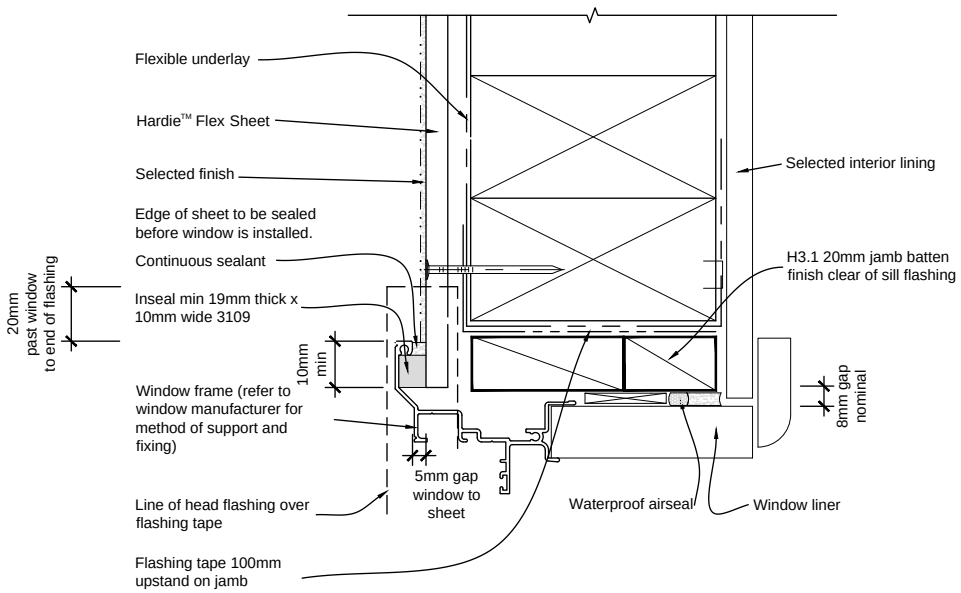
General notes for materials selection

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

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

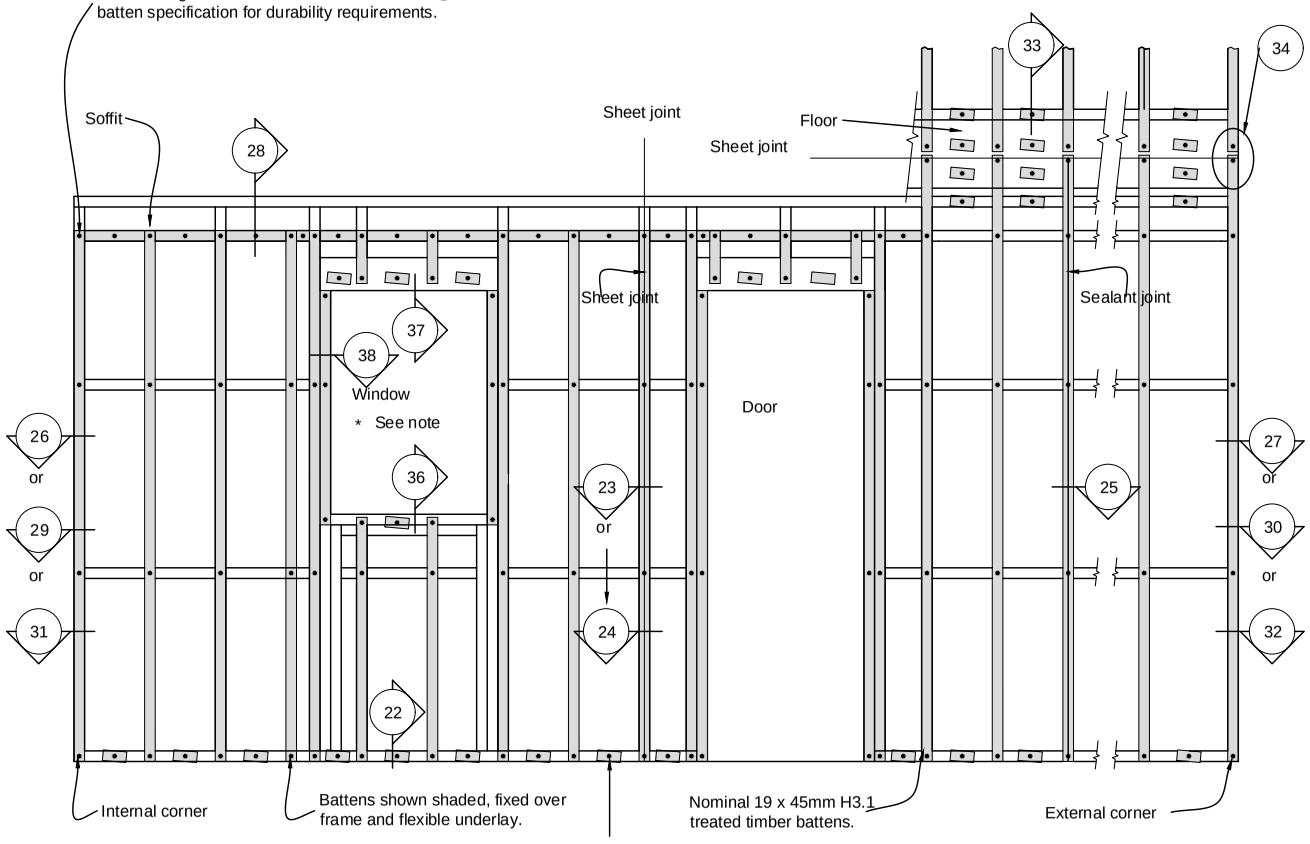


Note:
1. Also refer Figure 115 NZBC Clause E2/AS1 document for head and jamb details.



Note:
1. Also refer Figure 115 NZBC E2/AS1 document for head and jamb details

* **Note:** Horizontal packers are not to be installed on the sill trimmer within 100mm of the window opening edge.



Nominal 19 x 45mm H3.1 treated timber horizontal packers x 100mm long - fix with one nail central

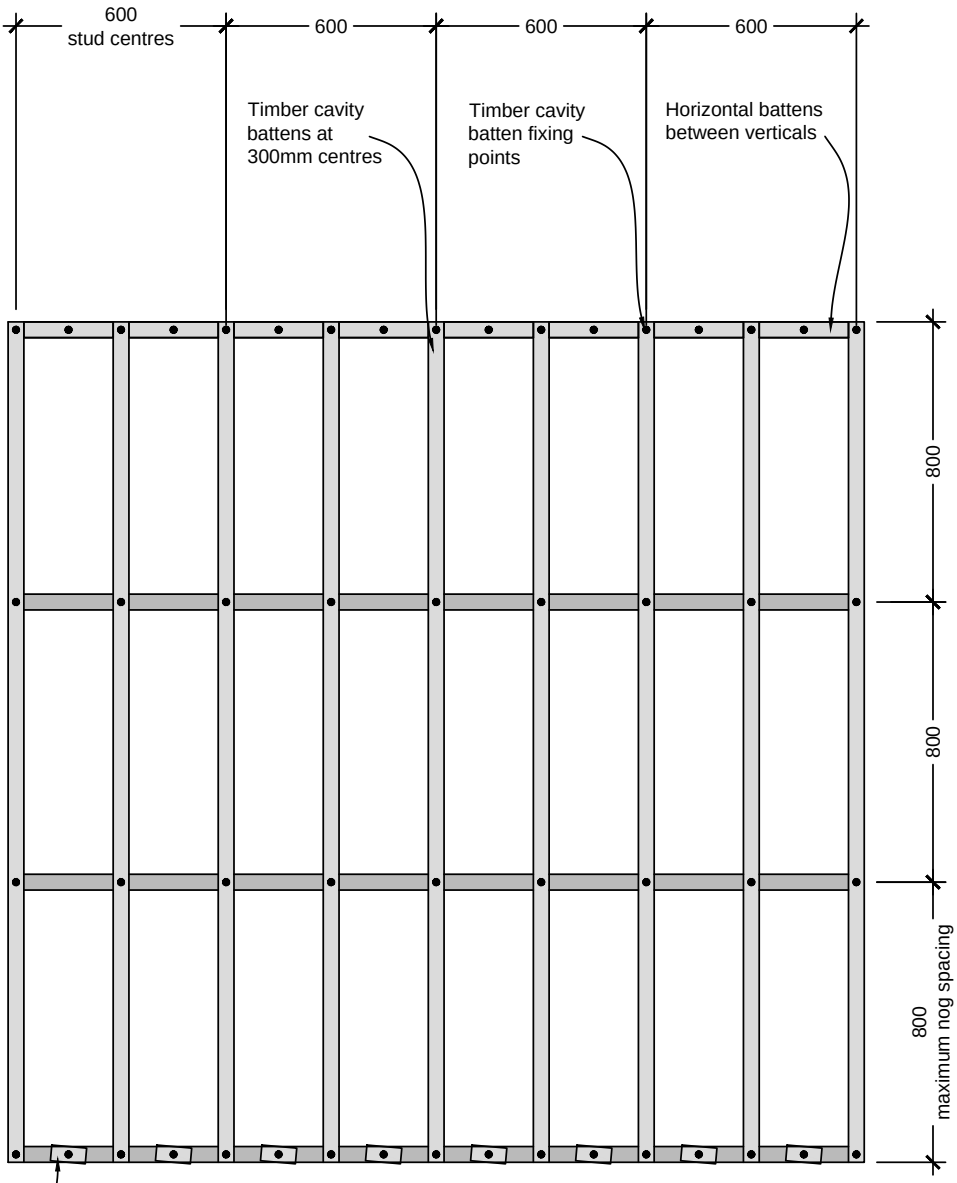
Note: Horizontal packers must be set to a fall of 5° min where shown

Note!
Section notations refer to Figure numbers.

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

WALL ELEVATION

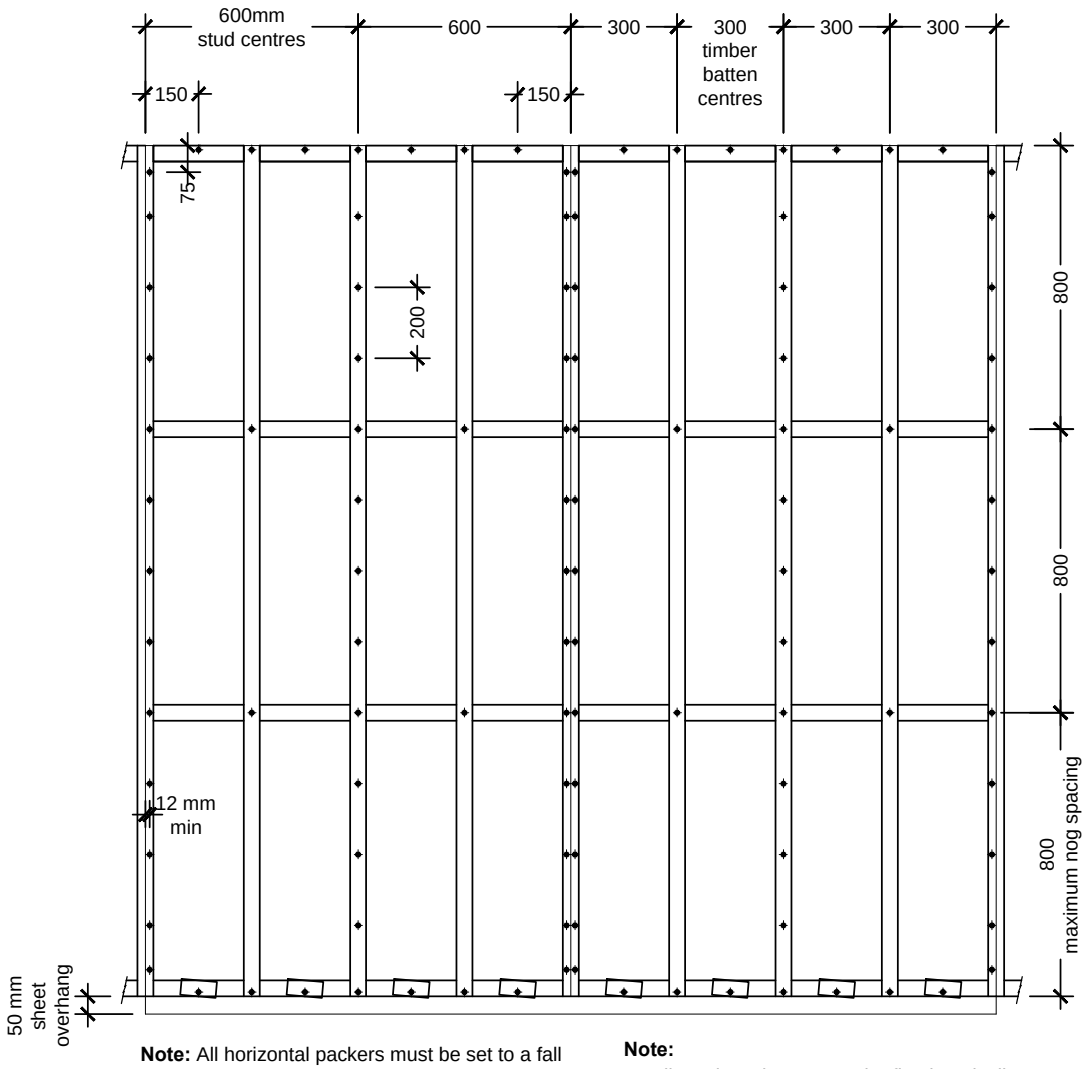
Figure 20: Cavity batten fixing



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

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

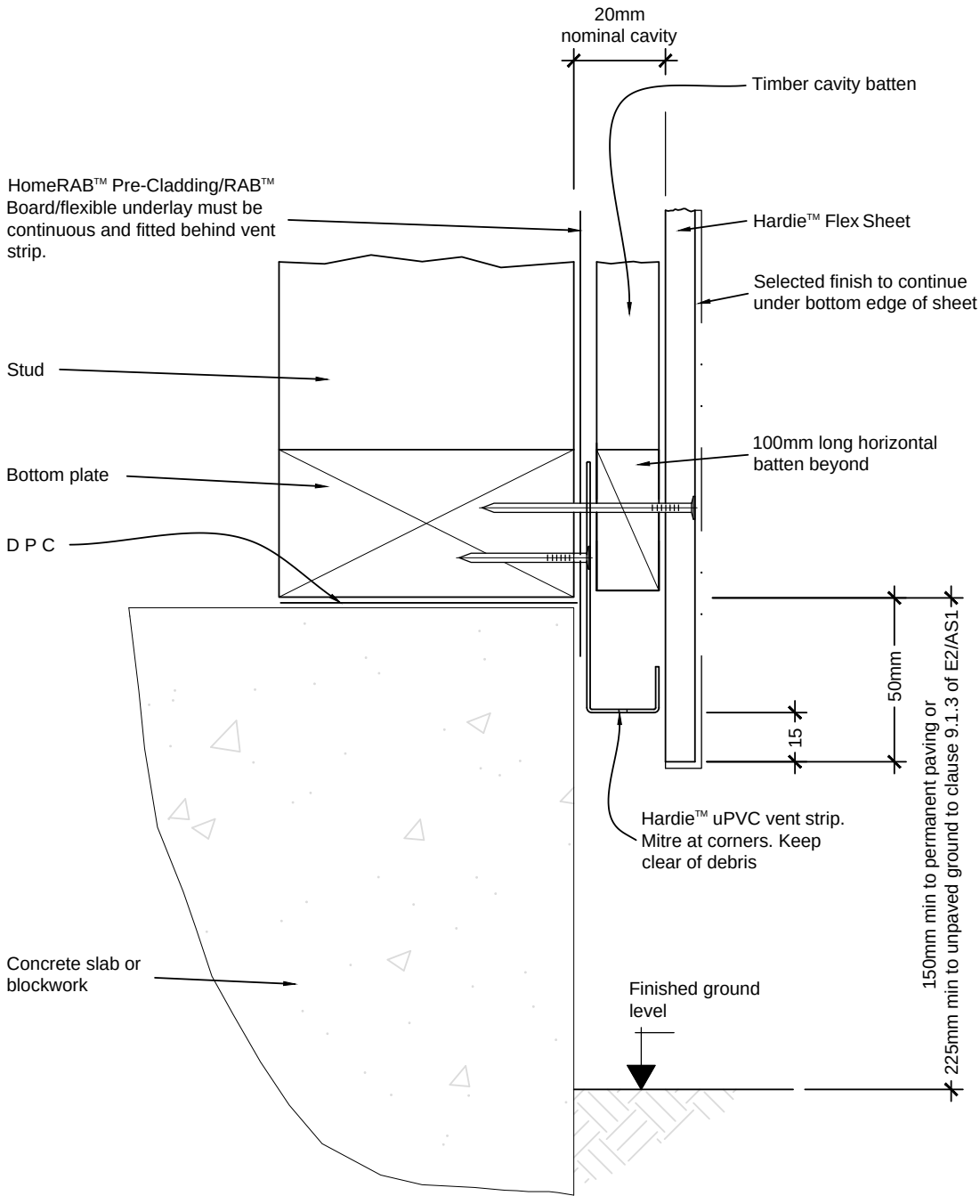
Figure 21: Cavity sheet fixing



Note: All horizontal packers must be set to a fall of 5° minimum

Note:
Hardie™Flex Sheets must be fixed vertically.

Figure 22: Cavity concrete foundation detail



Foundation Detail

Figure 23: Cavity vertical uPVC joint

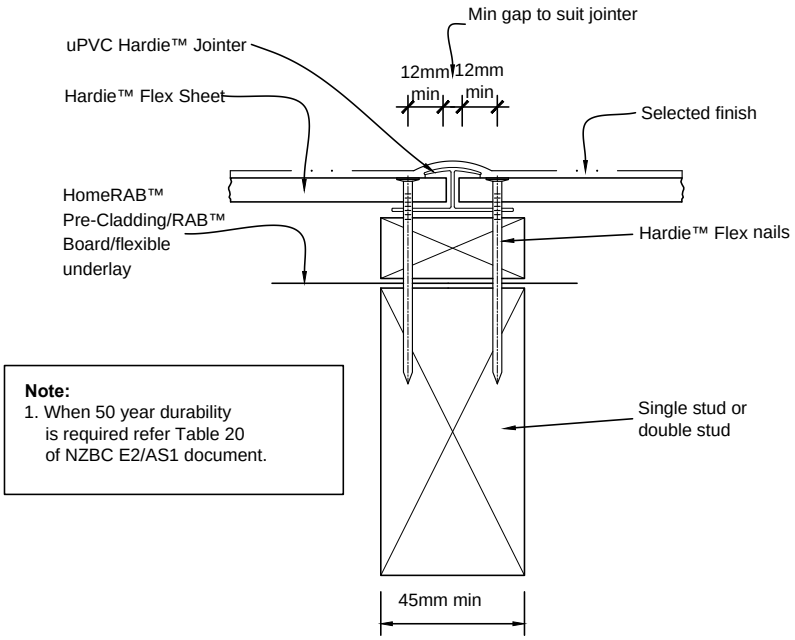
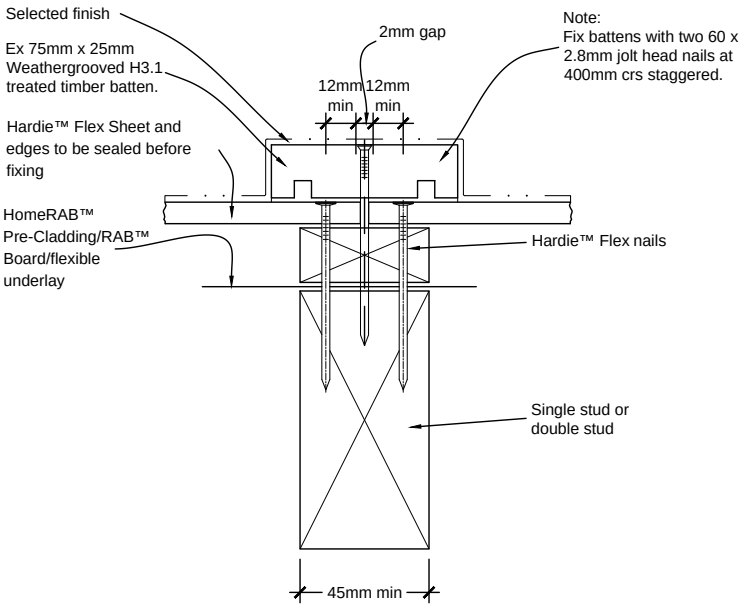


Figure 24: Cavity vertical timber batten joint



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

Figure 25: Cavity vertical sealant joint

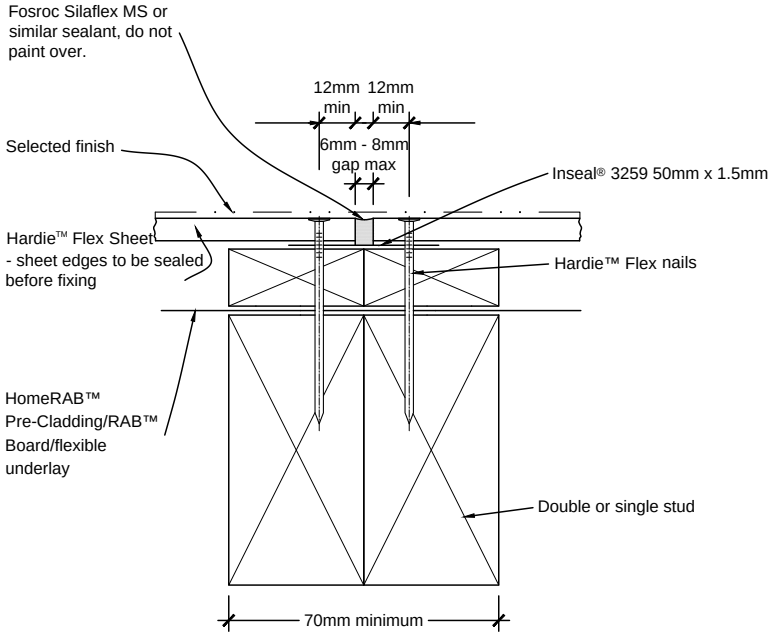
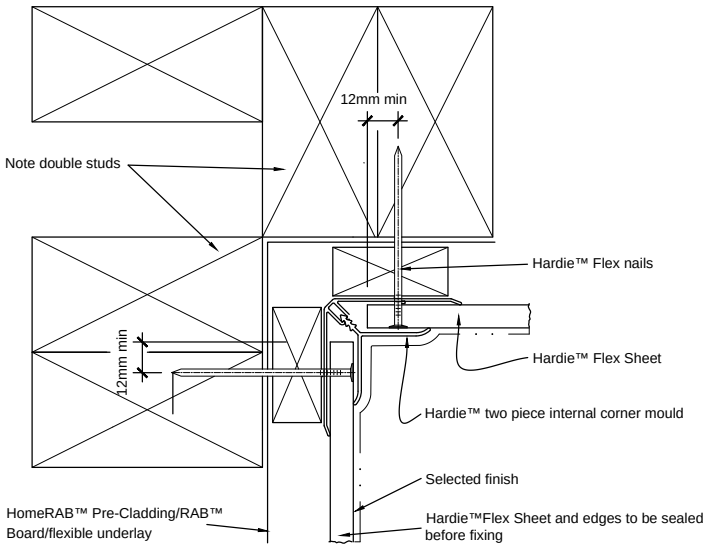
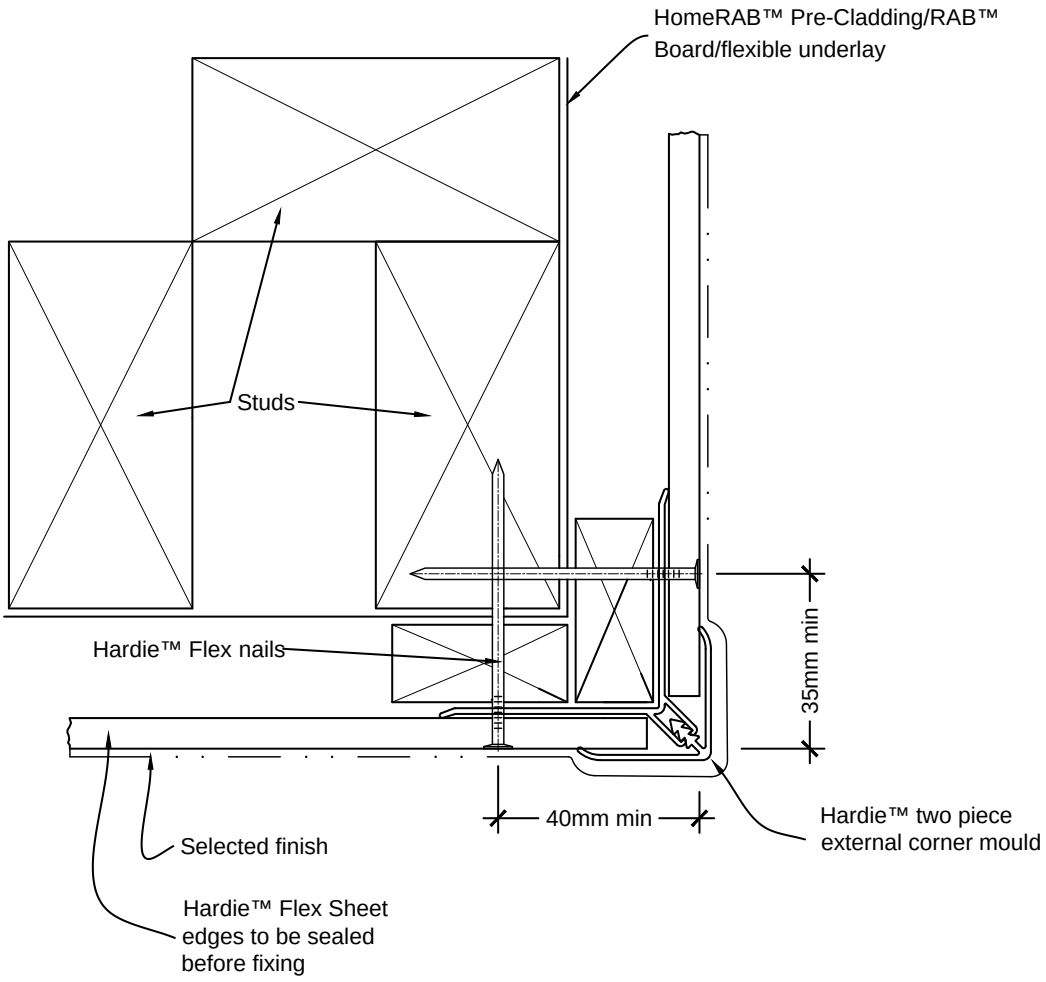


Figure 26: Cavity internal uPVC corner joint



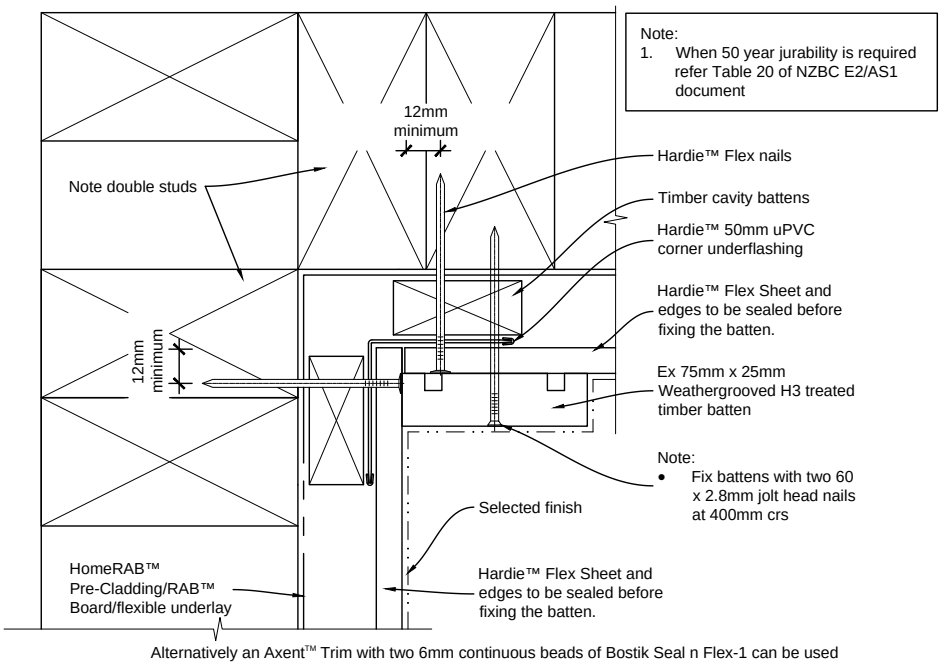
Note:
1. When 50 year durability is required refer Table 20 of NZBC E2/AS1 document.

Figure 27: Cavity external uPVC corner joint



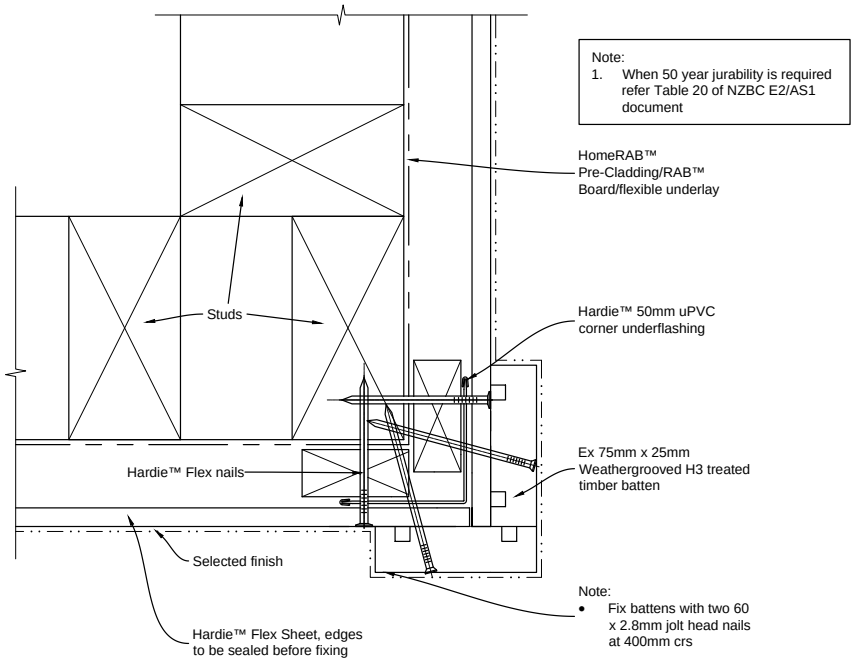
Note:
1. When 50 year durability is required
refer Table 20 of NZBC E2/AS1 document.

Figure 28: Cavity internal timber batten corner



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

Figure 29: Cavity external timber batten corner



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

Figure 30: Cavity internal sealant joint corner

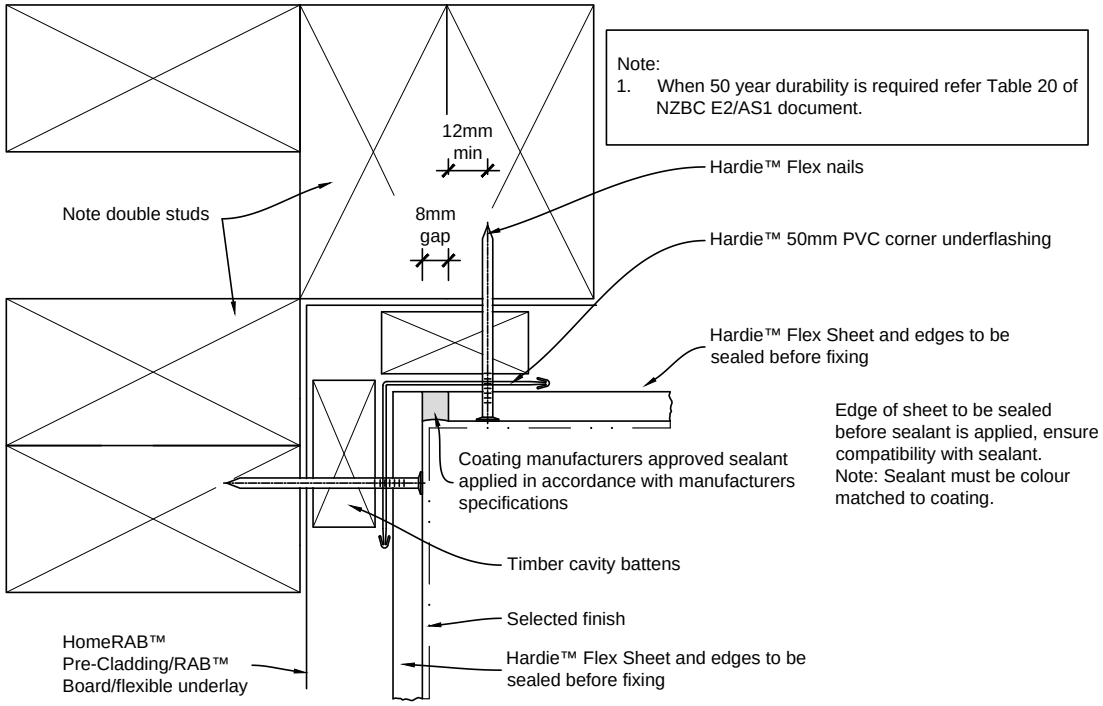
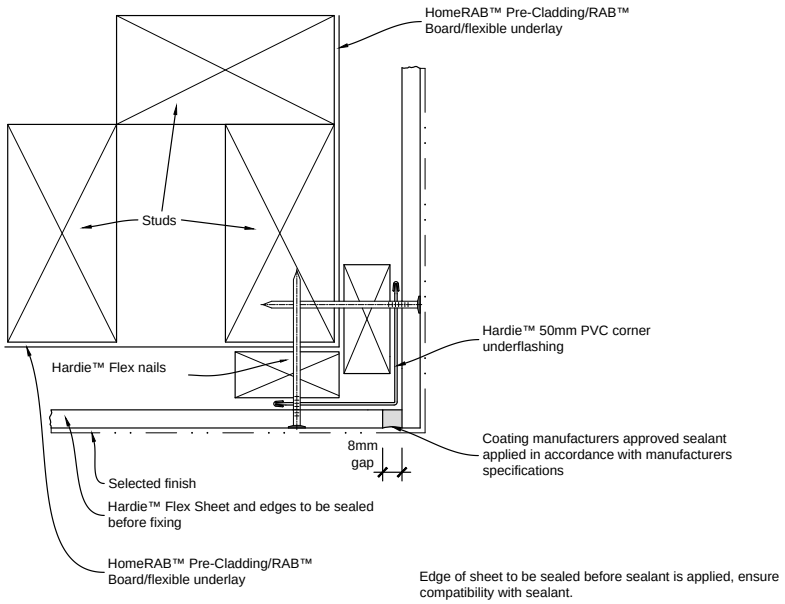


Figure 31: Cavity external sealant joint corner



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

Figure 32: Cavity soffit detail

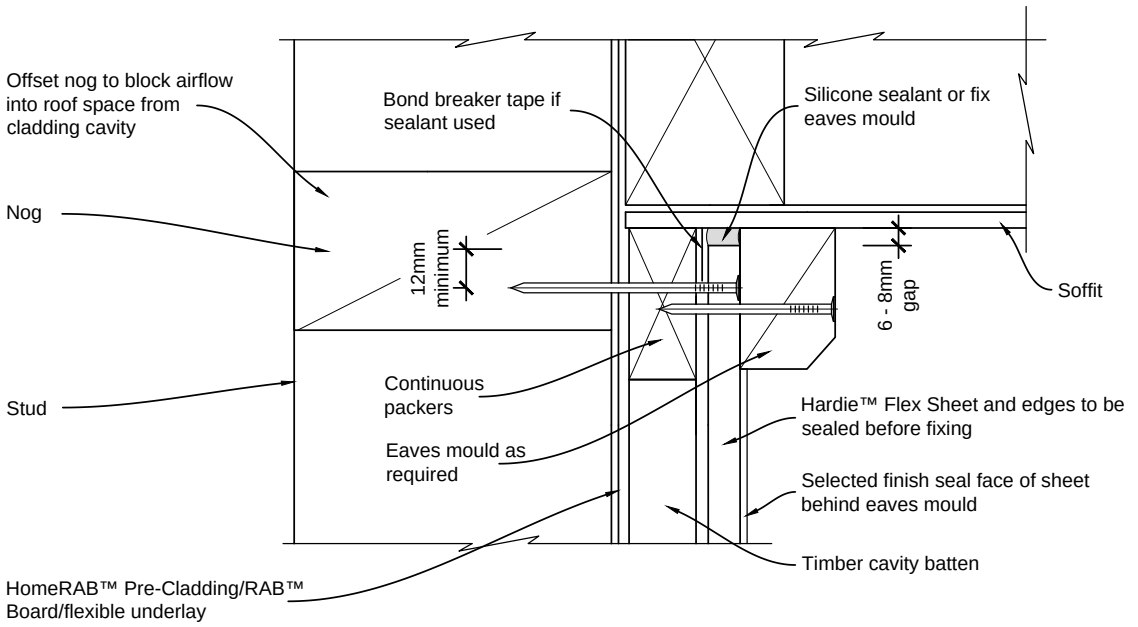


Figure 33: Cavity horizontal control joint

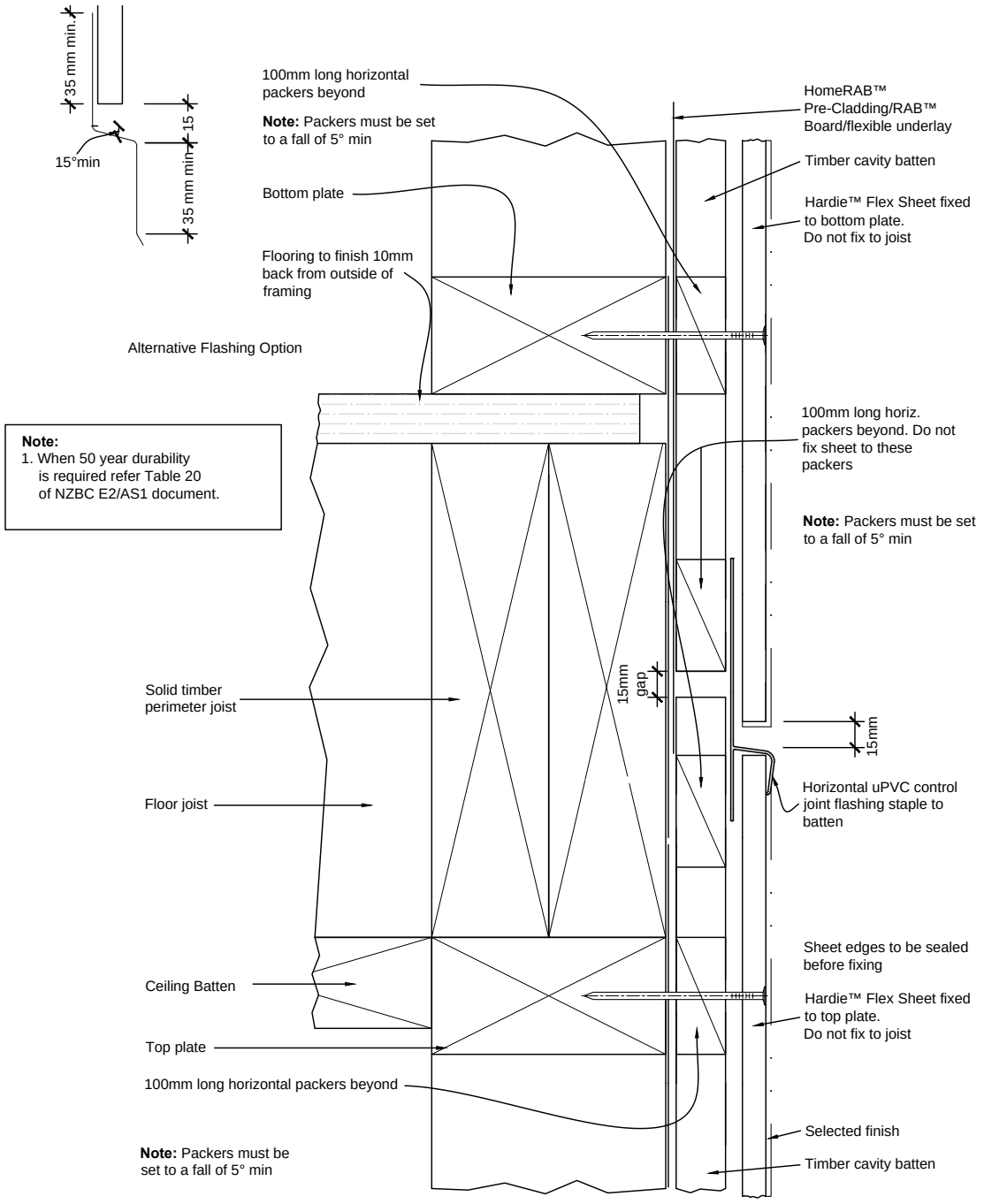


Figure 34: Cavity corner to ‘h’ mould joint

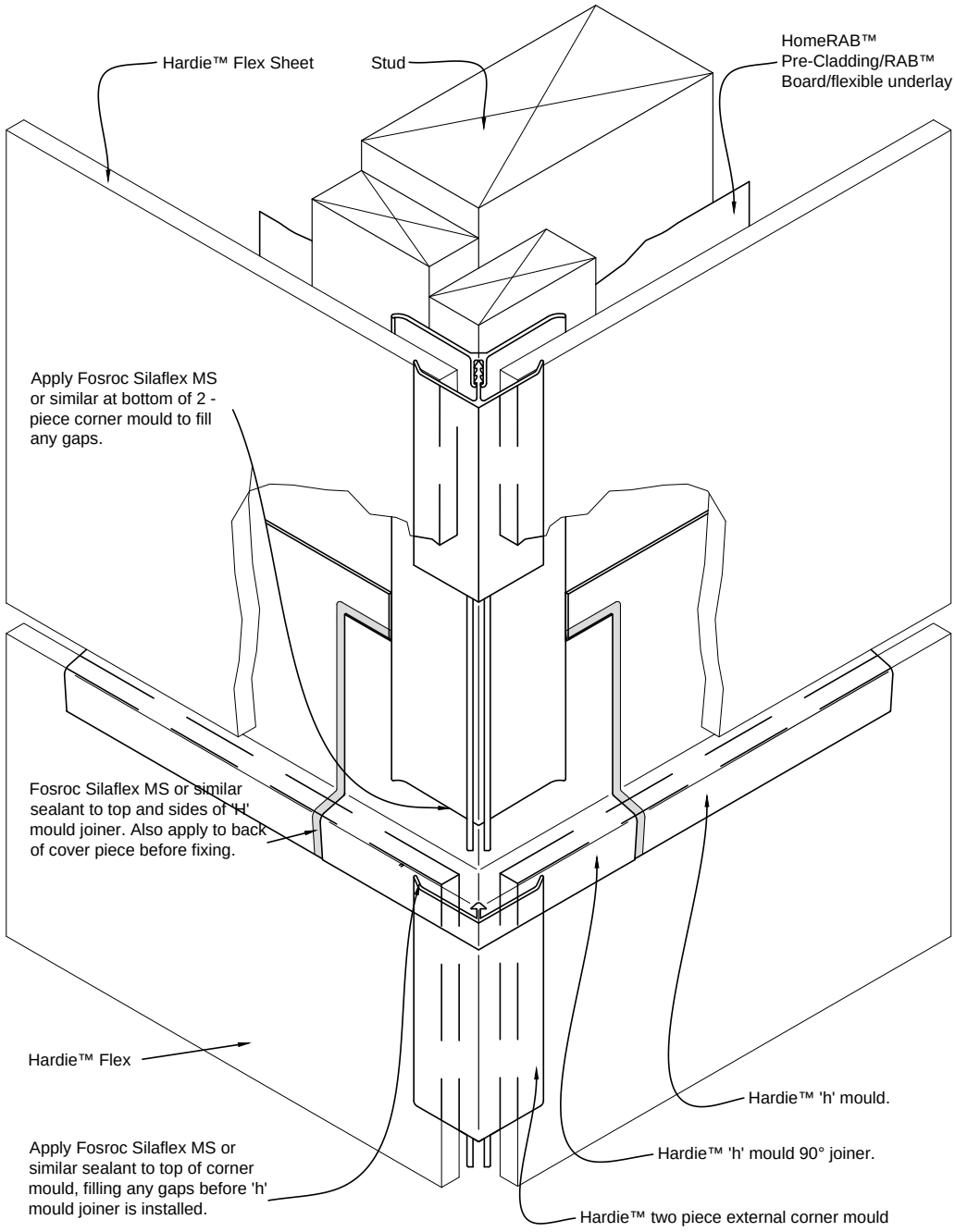
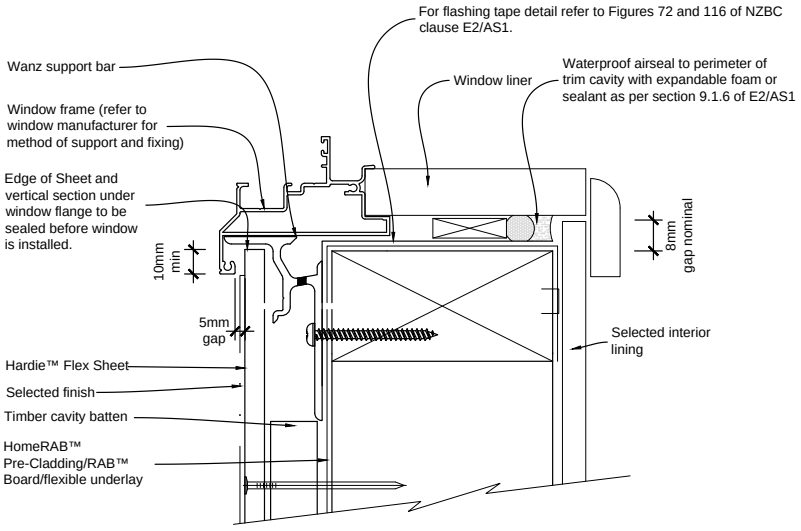


Figure 35: Cavity window sill

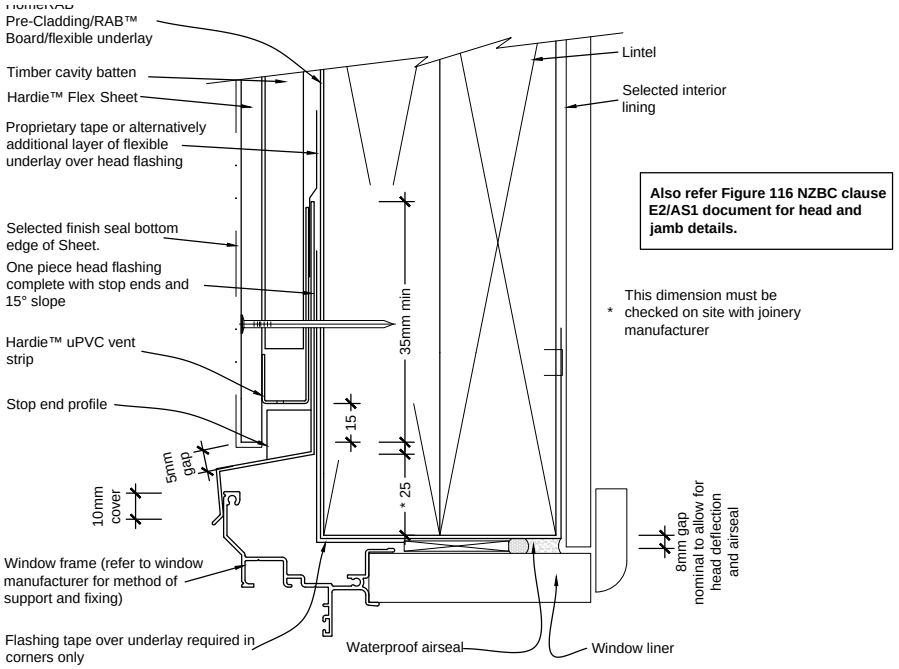


General notes for materials selection

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

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

Figure 36: Cavity window head



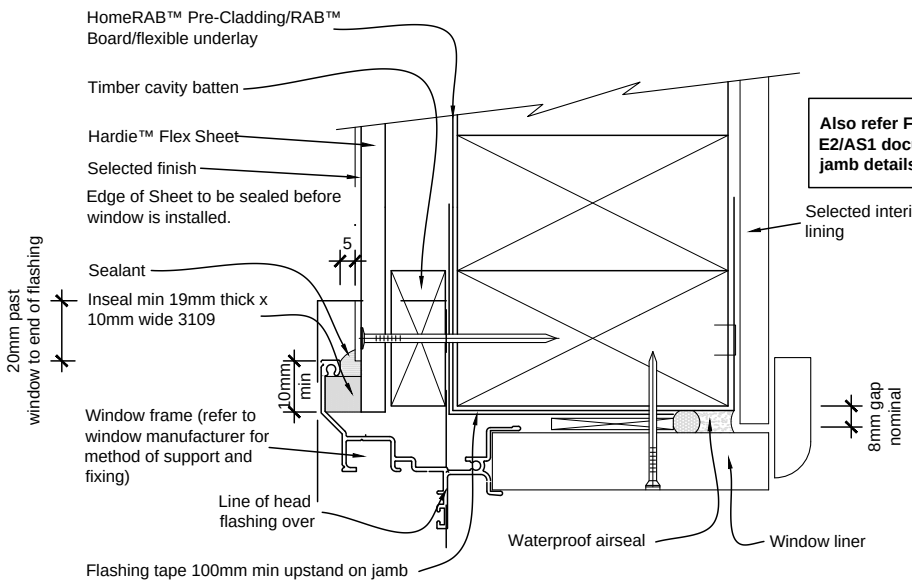

HomeRAB™ Pre-Cladding/RAB™ Board/flexible underlay
Timber cavity batten
Hardie™ Flex Sheet
Selected finish
Edge of Sheet to be sealed before window is installed.
Sealant
Inseal min 19mm thick x 10mm wide 3109
20mm past window to end of flashing
5
10mm min
Window frame (refer to window manufacturer for method of support and fixing)
Line of head flashing over
Flashing tape 100mm min upstand on jamb
Selected interior lining
8mm gap nominal
Waterproof airseal
Window liner
Also refer Figure 116 NZBC clause E2/AS1 document for head and jamb details.

Figure 38: Cavity one piece apron flashing joint

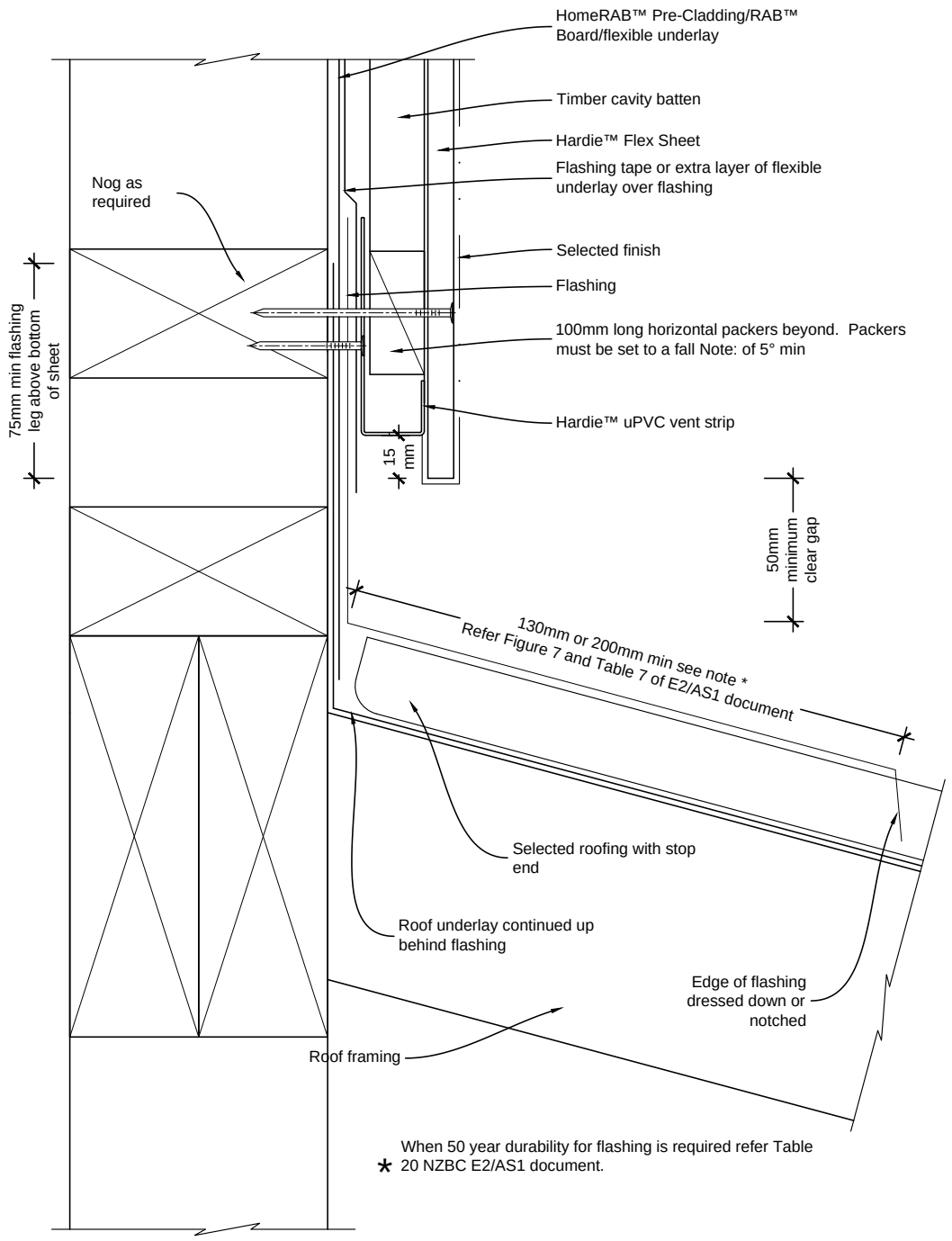


Figure 39: Cavity parapet flashing

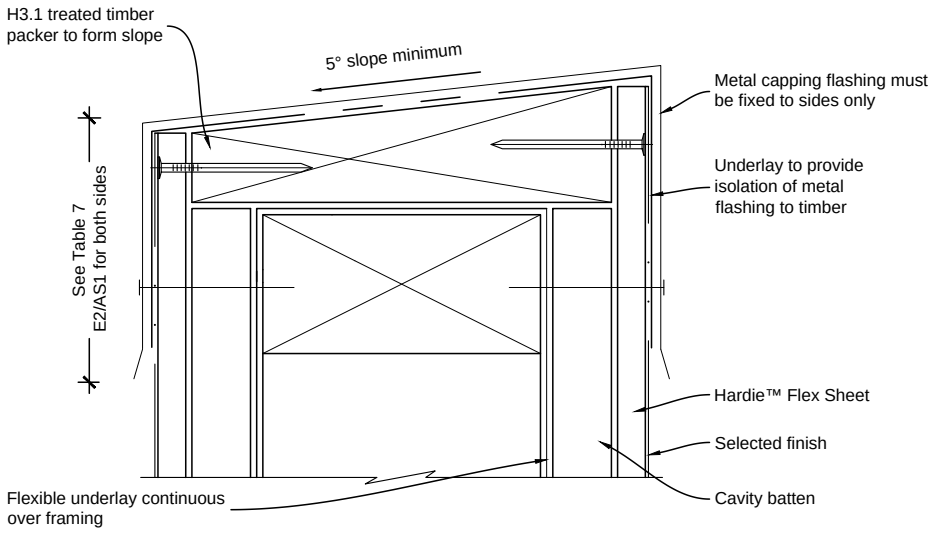
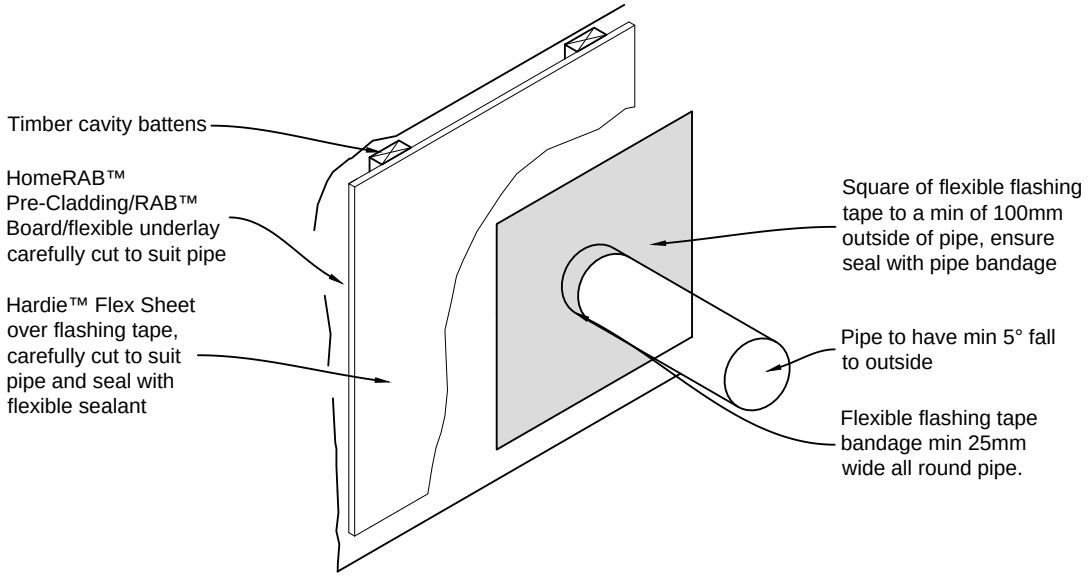


Figure 40: Cavity pipe penetration



Product Warranty

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

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

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.

b) This warranty is not transferable.

c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.

d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards.

e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.

f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).

g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.

h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

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

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