

NEW ZEALAND'S

#1

choice in
insulated vinyl
weatherboards

INSTALLATION SPECIFICATION

Prepare, install & care for
your installed Vinyl Cladding



vinylcladding
NEW ZEALAND

ABOUT MITTEN INSULATED VINYL CLADDING

Mitten Vinyl has been manufacturing quality vinyl products since the company was founded by Canadian engineer Doug Mitten in 1959. For over 50 years the most advanced technology and highest quality raw materials have combined with professional expertise to produce a wide range of vinyl weatherboard cladding, trims and accessories.

Quality control is an important aspect of the manufacturing process and tests are constantly performed during production to ensure consistency of gloss, colour and dimension. This is why Mitten Vinyl can confidently offer a 50 year warranty on its products. Mitten products are manufactured to Australian and New Zealand Standard AS/NZS 4256.4.

All Mitten products come with a complete set of trims to complement the finished walls. Whether used for enhancing new work or upgrading existing homes, the results are long-lasting and eye-catching. We also provide a factory warranty on all products.

Our cladding is lightweight and most installations take just a few days with minimum disruption. Maintenance is not demanding – a quick wash down annually will keep the appearance fresh and attractive.

TEXTURED TIMBER LOOK

- ☒ **50 YEAR TRANSFERABLE WARRANTY**
- ☒ **UV RESISTANT**
- ☒ **NO PAINT NEEDED, EVER**
- ☒ **IDEAL FOR EARTHQUAKE ZONES**
- ☒ **AVAILABLE IN A VARIETY OF COLOURS**
- ☒ **SELF-EXTINGUISHING FIRE PROPERTIES**
- ☒ **ROT PROOF**
- ☒ **EASY MAINTENANCE**
- ☒ **QUICK & EASY TO INSTALL**

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Please read this information completely before beginning any installation. The information supplied within is a general guide and does not override any manufacturer's stipulations on particular materials or usage. If you are unsure about any material contained herein, do not hesitate to call Vinyl Cladding NZ on **0800 MITTEN** for more detailed information.

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1.0 APPLICATION AND SCOPE

1.1 APPLICATION

Mitten Vinyl Cladding is a 1.143mm thick pre-coloured vinyl profiled sheet with 20mm or 30mm thick polystyrene foam backing. It is classified as a lightweight wall cladding and is suitable for residential and light commercial construction over most framing types. This installation manual covers installation over a 20mm cavity using timber framed external walls.

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 this manual.

If you are an installer

Ensure that you follow the design, moisture management and associated figures and material selection provided by the designer and this manual. All details in this manual must be read in conjunction with the specifiers specification.

Make sure your information is up to date

When specifying or installing Vinyl Cladding New Zealand products, ensure you have the current installation guide.

If you require further information, visit www.vinylcladding.co.nz, www.mittenvinyl.com.au or contact us on **0800 Mitten** or info@vinylcladding.co.nz.

1.2 SCOPE

This installation manual covers the use of Mitten Vinyl Cladding for buildings that fall within the scope and limitations of New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

This manual includes the use of Mitten Vinyl Cladding in cavity construction method and must be read in conjunction with any current appraisals for Mitten *Cambridge* Vinyl Cladding or Mitten *Cedarline* Vinyl Cladding profiles.

1.3 DETAILS

Various Mitten Vinyl Cladding details are provided in the Details section of this document. This document and details in CAD file are available from Vinyl Cladding New Zealand in electronic form. Please contact us if you require these. info@vinylcladding.co.nz or **0800 Mitten**.

1.4 SPECIFIC DESIGN

For use of Mitten Vinyl Cladding outside this published scope, the architect, designer or engineer must undertake specific design.

For advice on designs outside the scope of this specification, ask Vinyl Cladding New Zealand on **0800 Mitten**.

2.0 DESIGN

2.1 COMPLIANCE

Mitten Vinyl Cladding conforms to and surpasses certification standards in many countries. Please refer to Certifications on pages 76 and 77 for detailed information on current certifications and compliance information.

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this manual 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 manual. For applications outside the scope of this document and figures 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 New Zealand Building Code.

All dimensions shown are in millimetres unless stated otherwise. Mitten Vinyl conducts stringent quality checks to ensure that any product manufactured falls within their quality spectrum.

It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. Vinyl Cladding New Zealand Ltd will not be responsible for rectifying obvious aesthetic surface variations following installation or any issues resulting from incorrect installation and/or failure to adhere to proper installation procedure.

2.3 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 NZS3604 'Timber Framed Buildings' or be as 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 GROUND CLEARANCES

The floor and bottom edge of the cladding must have a minimum clearance to paved or unprotected ground as required by NZS 3604. Mitten Vinyl Cladding must overhang the bottom plate on a concrete slab by a minimum 50mm as required by NZBC Acceptable Solution E2/AS1.

The bottom of Mitten Vinyl Cladding must comply with NZBC Acceptable Solution, E2/AS1 section 9.1.3.

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 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 the walls, must comply with the requirements of relevant standards and the NZBC.

2.6 STRUCTURE

Timber framed buildings must be designed in accordance with NZS3604 (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.

In all cases stud spacing may not exceed 600mm centres maximum for all buildings situated in wind zones up to and including *Very High*, and 400mm centres maximum for buildings situated in NZS3604 wind zone *Extra High* and up to and including 2.5kPa.

2.7 WIND LOADING

Mitten Vinyl Cladding is suitable for use in all New Zealand wind zones including Extra High as defined in NZS 3604. A specific engineering design is required when the building falls in a specific engineering design (SED) wind zone.

Fasteners are 40mm x 8g with 8mm button-head size. A cyclone washer must be used with every screw fastener in Extra high wind zones.

Refer to Cyclone Washer in the Details section of this manual.

2.8

FIRE RESISTANCE

Please refer to *Certifications* on pages 76 and 77 for detail on the Fire Performance of Mitten Vinyl Cladding.

2.9 ENERGY EFFICIENCY

External walls constructed using Mitten Vinyl Cladding, and bulk insulation where the area of glazing is 30% or less of the total wall area and constructed as per this manual complies with the minimum requirements for walls in NZBC Acceptable Solution H1/AS1 (NZBC Clause H1 Energy Efficiency).

3.0 FRAMING

3.1 GENERAL

This manual is only suitable for timber-framed buildings. Other framing materials are outside of the scope of this installation manual.

3.2 DIMENSIONS

A 45mm minimum stud width is required unless noted otherwise in this manual.

3.3 TIMBER GRADE

Minimum timber grade requirements are framing grade in accordance with NZS 3631 'New Zealand Timber Grading Rules' or equivalent.

3.4 DURABILITY

To comply with NZBC requirements, the external framing must be treated to a minimum H1.2 treatment. Refer to NZBC Acceptable Solution B2/AS1 Durability for further information about durability requirements. Also refer to the framing manufacturer's literature for further guidance on timber selection.

Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers. Note: Refer to NZS 3602 for information about the allowable moisture content in timber.

3.5 FRAME CONSTRUCTION

All timber framing sizes and set-out must comply with NZS 3604 & stud, and dwangs centres as required by this manual.

3.6 CAVITY CONSTRUCTION METHOD

The following framing must be provided for cavity construction method:

1. When studs are at 600mm centres, the dwangs must be provided at 800mm centres maximum.
2. When studs are at 400mm centres the dwangs may be provided at 1200mm centres maximum.
3. Double studs are required at internal corners.
4. Extra packers may be required at external corners.

A uPVC cavity vent strip must be installed at the base of all walls constructed using the cavity construction method.

3.7 STUD FINDING

On internal corners of house walls, some eave applications and around doors, windows and other external obstructions you will be unable to get fixing onto studs. Be careful not to tighten this screw so that it restricts expansion.

3.8 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.

4.0 PREPARATION Inspect and plan the job in advance. Check surfaces for straightness and batten when necessary. Surfaces should be uniform and straight from various viewing angles. To achieve designed performance, vinyl cladding must be installed over a weather resistant barrier system that includes a continuous weather resistant material and properly integrated flashing around all penetrations and where vinyl cladding interfaces with other building products such as brick, stone, or stucco. Always consult the NZBC for minimum weather barrier requirements.

4.0 PREPARATION OF SUBSURFACE

4.1 WALL UNDERLAY

Wall underlay must be provided as per NZBC Acceptable Solution E2/AS1 'External Moisture' and NZS 3604. The wall underlay must comply with Table 23 of E2/AS1 and must be fixed in accordance with E2/AS1, NZS 3604, and the wrap manufacturer's recommendations.

Walls which are not lined on the inside (i.e.: garage walls) must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of NZBC Acceptable Solution E2/AS1.

4.2 STRUCTURAL BATTENS

Structural battens provide airspace between the frame and cladding. Timber battens must be minimum H3.1 treated in accordance with NZS 3602 (Chemical preservation of round and sawn timber) to comply with the durability requirements of E2/AS1. To achieve structural fixing of the batten onto the structural frame, the fixings must be: 90mm x 3.1 flat head nails. The batten fixing positions must be: at maximum 300mm centres vertically; staggered 12mm either side of the batten centre line.

4.3 FASTENERS

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixings to be used in relation to the exposure conditions. Also refer to NZBC Acceptable Solution 'E2/AS1' Tables 20

and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

4.4 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads, jambs must be flashed prior to Mitten Vinyl Cladding installation. The selected flashing materials must comply with the durability requirements of Table 20 Acceptable Solution 'E2/AS1'.

Refer to Details for further information.

4.5 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the building wrap and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using a horizontally installed polypropylene tape at 300mm vertical centres.

5.0 FIXING

5.1 GENERAL

Mitten Vinyl Cladding must be fixed at a maximum of 600mm centres for wind zones up to and including *Very High*, and 400mm centres for the *Extra High* wind zone and specific design wind pressures, up to and including 2.5kPa. Vertical lap between Mitten Vinyl Cladding panels must be 50mm minimum, 10mm between fixing strip and 40mm overlap.

5.2 SCREW SIZE, FIXING & FASTENING

Mitten Vinyl Cladding and trims to be fixed to the cavity battens. 32mm 8g button head screws should be used at stud centres, 600mm centres maximum. Button head screws to be no less than 8mm head size.

Refer to Cyclone Washer in the Details section of this manual.

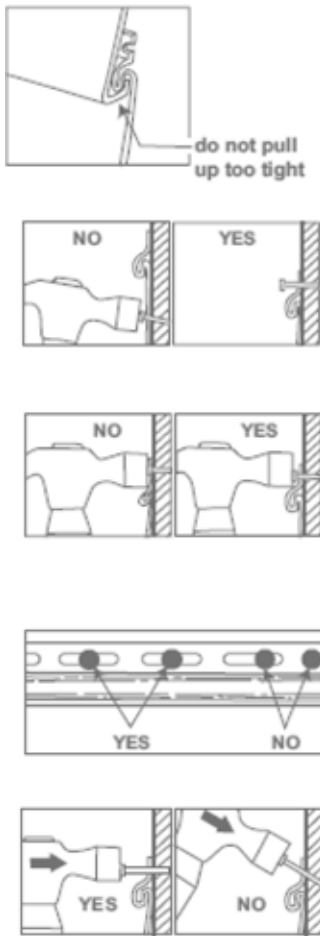
LENGTH OF SCREW FOR 20MM FOAM BACKED CLADDING:

1. 20mm foam backing – 32mm long minimum x 8g button-head screws.
2. 30mm foam backing - 40mm long minimum X 8g button-head screws.

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

Screws should have a corrosion resistant coating with a flat head of 8mm diameter. On cladding and accessories fit screws back 150mm from the ends of overlaps when overlapping.

DIAGRAM A – Fixing Procedure



When screwing, start in the centre of the panel and work towards the ends. Drive fasteners straight and level to prevent distortion and buckling of the panel.

IMPORTANT: Ensure all panels are fully interlocked when fastening. Do not nail through the face of the cladding, this may result in ripples in the cladding.

Refer to the diagram at left for proper fixing technique/position.

NOTE: This diagram depicting hammer and nail is to illustrate correct angle and position of fixing only and the screwing method as outlined throughout this guide should be adhered to.

CLADDING MUST NOT BE SCREWED TIGHTLY TO THE WALL; this will restrict expansion as will screwing at the ends of slots which may result in buckling of the cladding with changes in temperature. Unless indicated otherwise in this installation manual, always place screws in the centre of the fixing slot.

6.0 FINISHING

6.1 PAINTING

Mitten Vinyl Cladding is a pre-coloured cladding system therefore does not require any priming or painting before, during or after installation throughout its life.

6.2 SEALANT

Caulking, or sealing with a non-hardening silicone type filler in areas where water can penetrate is essential; an example would be around pipes etc. Fillers are not to be used for ill-fitting components. All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with the manufacturer's instructions.

7.0 PENETRATIONS

When cutting holes to accommodate external obstructions that remain on the wall e.g.: plumbing, the cut that is made to enable the board to go over the obstruction should be hidden as best as possible behind it. Otherwise the cut should be made vertically downwards. If the hole is near the board at the end, a cut can be made along the under side of the step.

8.0 STORAGE & HANDLING

If you are transporting vinyl cladding to a job site, make certain to keep cartons flat and supported along their entire length. At the job site, take the following precautions when storing panels:

1. Mitten Vinyl Cladding must be kept dry prior to and during installation.
2. Keep on a flat, level surface and support the entire length of the pack.
3. If left in direct sunlight, cut open the end of the pack wrap to allow for air movement.
4. Do not store the cladding in a location where temperatures exceed 54C (i.e. On hot tarmac or under tarps or plastic wrap without air circulation). 5. Store away from areas where falling objects or other construction activity may cause damage.

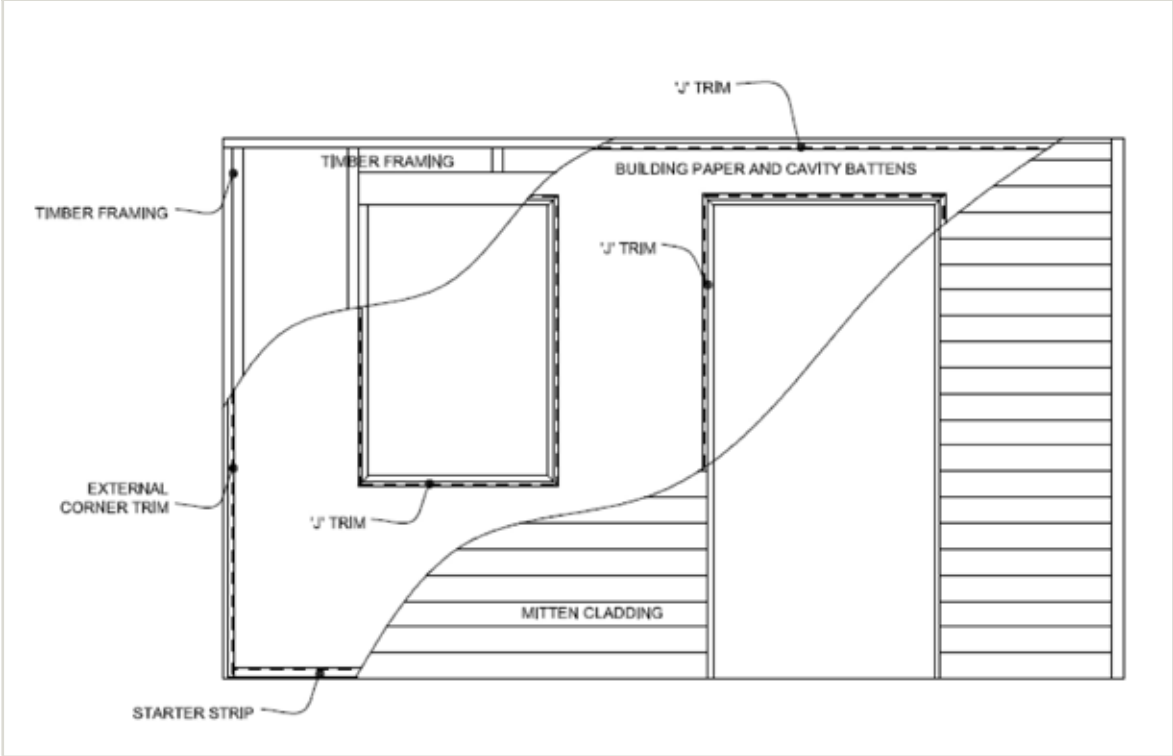
9.0 MAINTENANCE

While Mitten Vinyl Cladding comes closer to being totally maintenance free than any other cladding on the market, it will become dirty just as any other product which is exposed to atmospheric conditions. As a guide, it is recommended that basic normal maintenance tasks shall include, but not be limited to:

1. To remove any build up of air blown contaminants an annual clean with water and detergent is recommended using a long-handled soft bristled car brush attached to your garden hose.
2. Avoid using stiff bristle brushes or abrasive cleaners, which may change the gloss of the cleaned area and cause the siding to look patchy. Do not use a water blaster to wash the cladding.
3. Always follow the precautionary labelling instructions on the cleaning agent you intend to use. Protect plants etc from direct contact with all cleaning agents.

10.0 TRIM AND ACCESSORIES

DIAGRAM B – Wall cross-section showing use of cladding and accessories



TRIM COMPONENTS

		
STARTER STRIP Secures the first course of cladding panel to the building. SIZE: 3.65 metres per length	'J' TRIM Universal cladding and soffit receiving channel for use around utility openings, under eaves etc SIZE: 3.65 metres per length	CORNER POST Corner treatment for use with Mitten Cambridge Vinyl cladding. SIZE: 3.65 metres per length

PLEASE CONTACT US FOR CORRECT TRIM SIZING IN RELATION TO FOAM BACKING THICKNESS.

11.0 BASIC INSTALLATION GUIDELINES

Before getting started, it is important to review several common rules for vinyl cladding application.

Vinyl cladding, like all building materials, expands and contracts with temperature changes. The amount of expansion and contraction can be as much as 10mm. This expansion and contraction must be allowed for in advance to prevent the cladding from buckling which will mar the appearance of a building.

The following rules, which come up throughout this guide, are critical for proper vinyl cladding installation:

1. Do not store cladding in a location where temperatures exceed 54 degrees Celsius (i.e.: on tarmac during unusually hot weather or under tarps or plastic wrap without air circulation).
2. Installed panels must move freely from side to side.
3. When installing a panel of cladding, push up from the bottom until the lock is fully engaged with the piece below it. Do not force the panels up or down when fastening it into position. Stretching the panel upward pulls the natural radius out of the panel and increases the friction of the locks.
4. Always fix in the centre of the fixing slot.

WARNING: Do not fix at the end of the slot. Doing so will cause the cladding panel to be permanently damaged. If you must fix near the end of a slot to hit a stud etc., extend the length of the slot with a punch tool.

5. Do not drive the head of the screw tightly against the cladding fixing hem. Allow 1mm clearance between the screw-head and the cladding panel. Drive screws straight and level to prevent distortion and buckling of the panel.
6. Leave a minimum of 6.5mm clearance at all openings and accessory channel stops to allow for normal expansion and contraction. When installing in temperatures below 5 degrees Celsius, increase minimum clearance to 10mm.
7. Do not seal the panels where they meet the receiver of corner posts or J-trim. Do not seal the overlap joints.
8. Do not face-fix or staple through vinyl cladding. Vinyl cladding expands and contracts with outside temperature changes. Face-fixing can result in ripples in the cladding.

RULE OF THUMB FOR SUCCESSFUL VINYL CLADDING INSTALLATION: ALLOW FOR MOVEMENT.

12.0 TOOLS AND EQUIPMENT

12.1 TOOLS REQUIRED

Power circular saw with sharp, fine-tooth plywood blade mounted in reverse direction or small angle grinder with metal cutting blade. Other common hand-tools, such as a hammer, square, chalk-line, level and tape measure are needed for proper installation.

Other tools include:

Utility knife: Vinyl is easy to cut, trim and score with a utility knife or scoring tool.

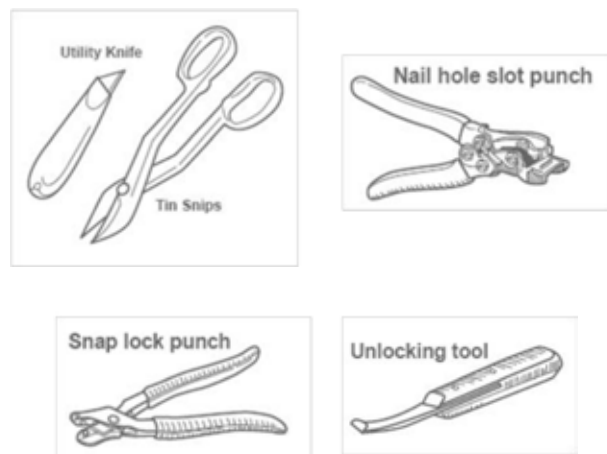
Snap Lock Punch: A snap-lock punch is used to punch lugs in the cut edges of cladding to be used for the top or finishing course at the top of a wall or underneath a window.

Hole Slot Punch: Occasionally it may be necessary to elongate a fixing hem slot. The hole is elongated to allow for expansion and contraction.

Unlocking Tool: Remove or replace a cladding panel with the unlocking tool. Insert the curved end of the tool under the end of the panel and hook onto the back lip of the butt lock. To disengage the lock, pull down and slide the tool along the length of the panel. Use the same procedure to re-lock a panel.

Tin Snips: These can be used for cutting trims, around windows and doors etc.

DIAGRAM C – Basic Tools

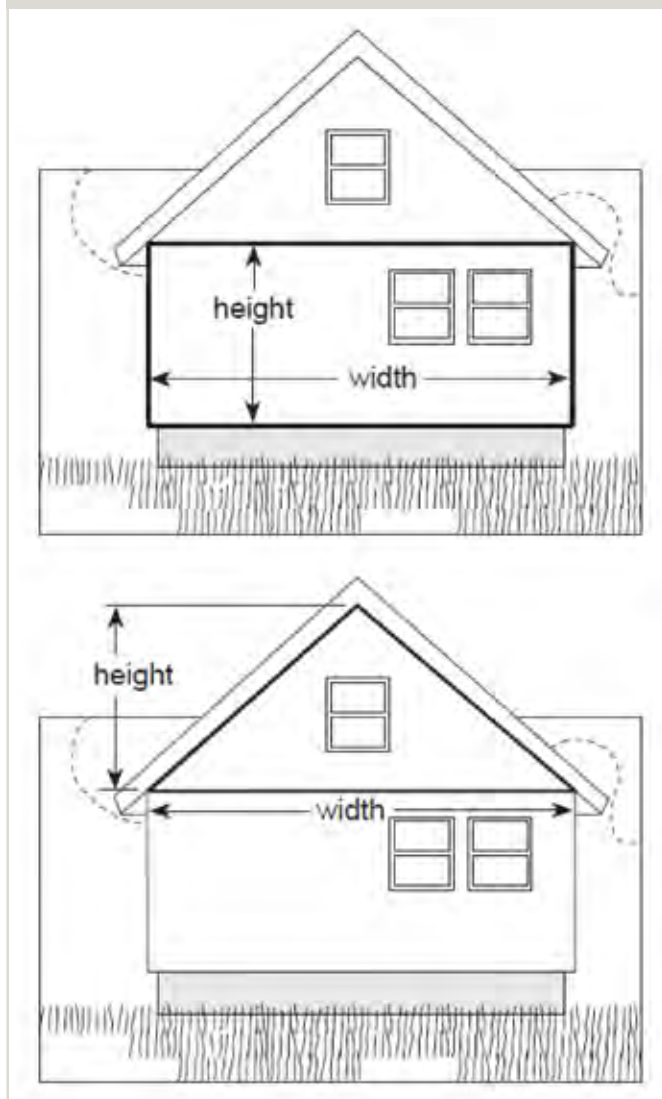


13.0 ESTIMATING

Use the illustrations and formula below to assist in calculating your cladding quantities.

NOTE: When estimating for a large project, you may want to add a wastage allowance of 10% to the totals for cladding and accessories.

DIAGRAM D – Rectangular & Triangular Gable End Surfaces



Rectangular wall surfaces

Measure height (excluding gables). Measure width (including doors and windows).

$$\frac{\text{height}}{\text{height}} \times \frac{\text{width}}{\text{width}} = \frac{\text{surface area}}{\text{surface area}}$$

Repeat for remaining walls.

Triangular gable end surfaces

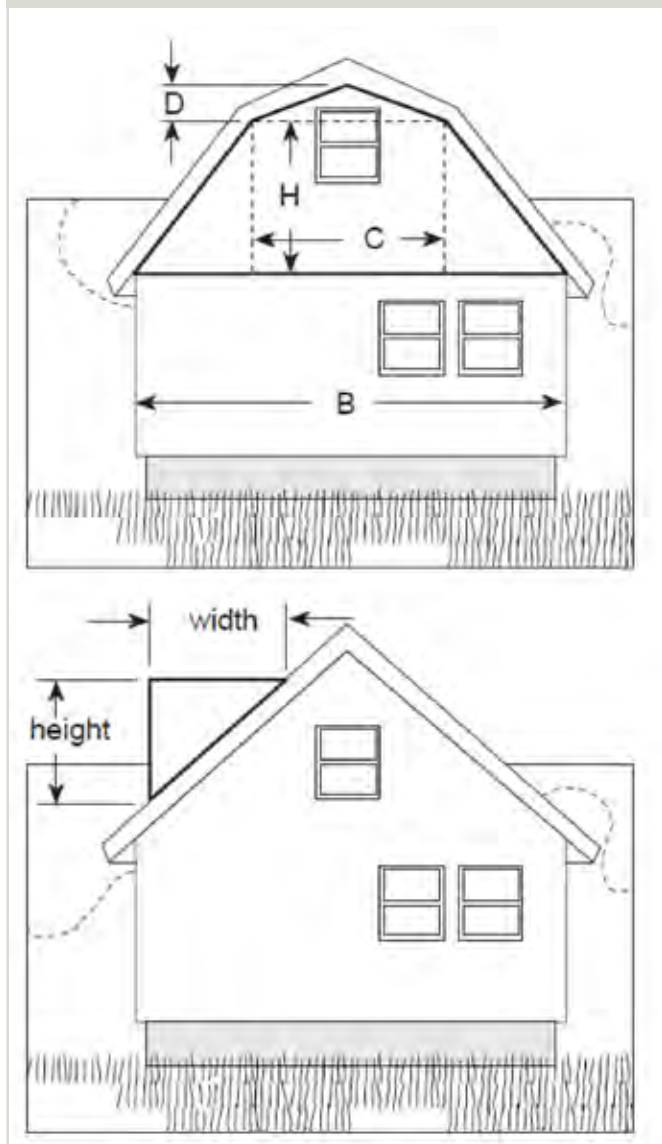
Measure height at centre (add 25mm to allow for waste). Measure width and divide by half.

$$\frac{\text{height}}{\text{height}} \times \frac{\text{width}}{\text{width}} = \frac{\text{surface area}}{\text{surface area}}$$

Repeat for remaining gables.

PLEASE ALLOW AN ADDITIONAL 10% FOR WASTAGE ON LARGER JOBS.

DIAGRAM E – Upper Wall of Gambrel House & Dormer Sides



Upper wall of gambrel house

Divide the upper wall of a gambrel house as shown in the illustration. Then use the following formulas:

$$1/2 (B + C) \times H = \underline{\hspace{2cm}}$$

$$1/2 C \times D = \underline{\hspace{2cm}}$$

Add these figures to get total area: $\underline{\hspace{2cm}}$

Repeat for remaining gambrel surfaces.

Dormer sides

Measure height of dormer (add 25mm to allow for waste).

Use the following formula:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

(width) (1/2 height) (surface area, 1 side)

$$\underline{\hspace{2cm}} \times 2 = \underline{\hspace{2cm}}$$

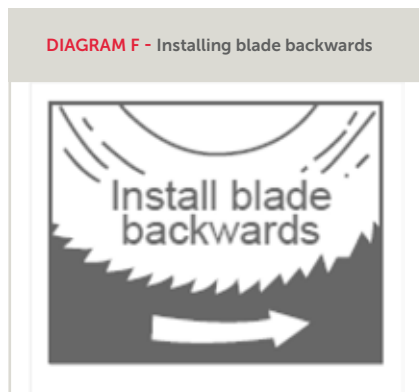
(surface area, 1 side) (total dormer surface area)

Repeat for all dormers.

14.0 CUTTING THE CLADDING

Safety goggles are always recommended for all cutting and fixing operations. As on any construction job, use proper safety equipment and follow safe construction practices.

If you are using a circular saw, install the fine toothed (plywood) blade backwards on the saw for a smoother, cleaner cut, especially in cold weather. Cut slowly.



CAUTION: Use of a backwards blade on any other materials could be unsafe.

A 4-inch angle grinder may also be used with nestle or masonry cutting wheel. Note: For control of the cut always bring the grinder back towards you using the reverse spin of the blade.

Care should be taken that there are no obstructions under the cutting surface before beginning to cut the cladding.

15.0 EXPANSION & CONTRACTION

In extreme temperatures, more or less room for expansion and contraction may be required inside the trims. As a rule, allow 5mm clearance at each end of the board (a 10mm total), but refer to the points below for extra allowance due to extreme weather.

The following is recommended:

1. Temperatures between -10 and 5 degrees Celsius during installation should have 10mm removed off each end of the board (20mm total).
2. Temperatures above 5 degrees Celsius during installations should allow 5mm off each end (10mm total). Ensure that all weatherboards are clipped in and fully interlocking before nailing.

Further information on allowances for expansion and contraction can be found in Table 5, Page 78.

16.0 PREPARING WALL SURFACES

Inspect and plan the job in advance. Check the surfaces for straightness, all surfaces should be uniform and straight from various viewing angles.

To achieve design performance, Mitten Vinyl Cladding must be installed over a weather resistant barrier system that includes a weather-resistant material, and properly integrated flashing around all penetrations and where vinyl cladding interfaces with other building products such as brick, stone or stucco.

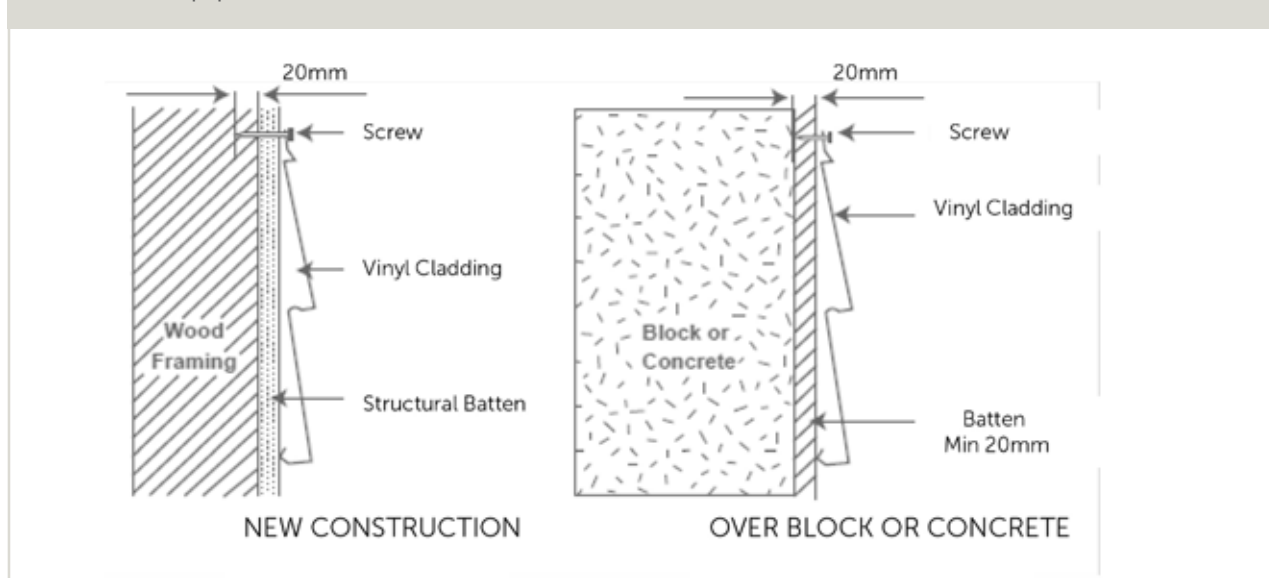
Always consult the applicable building code for minimum weather barrier requirements in your area. Keep in mind that additional measures may provide better protection against water intrusion than the minimum requirements of the building code.

16.1 NEW CONSTRUCTION

Ensure all studs are straight and true. Correct any bowed studs. Ensure all nails and building wrap are in place. Wall underlay complying with E2/AS1 Table 23 is required under new construction or if old cladding is removed.

Consult the New Zealand Building Code and apply according to the manufacturer's recommendations. In all cases install the products so they are secured firmly to the substrate so that they provide a smooth, even surface for the application of the final cladding installation.

DIAGRAM G - Wall preparation for new construction & over block or concrete



17.0 INSTALLATION: TRIMS

BASIC TIPS FOR A SUCCESSFUL INSTALLATION

17.1 STEP 1: OBTAINING A STARTING POINT

The first step is to determine where you will apply the first course of cladding. This can be the same level as the old cladding, or on new construction at a level that will cover the edge of the foundation by a minimum of 50mm. Use a chalk line and a level to obtain a horizontal starting point so that all installed cladding will be perfectly level. At all corners, use a plumb line to ensure that posts are vertical. Follow these steps in the order shown for the easiest and best application. If joins must be stacked, they have to terminate in a J-trim and begin again from another.

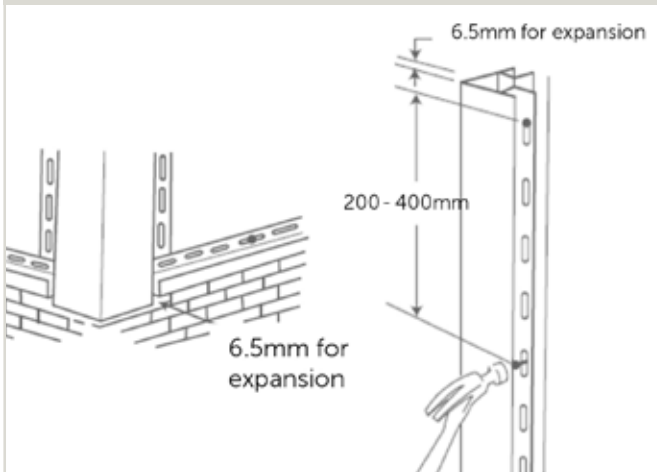
17.2 STEP 2: INSTALL CORNER POSTS

Before the cladding itself can be hung, a number of accessories must be installed first. This includes starter strip, corner posts, window flashing, trim and J-trim over the roof lines and at top of walls.

1. Measure from the top point on the corner of the house down to the bottom of where the first board will be. This is the length of the outside corner post.
2. Begin by screwing at the top of the slot, halfway up the post. The rest of the fixing must be in the centre of the slots. If more than one length is required, refer to further information on cutting and overlapping throughout the manual.

3. Fix at 300mm intervals. Care should be taken to position the corner trim accurately and square to the corner. It is important that the outside corner posts are installed accurately and squarely to the corner. It is possible to pull the corner out of shape if care is not taken, resulting in unevenness.

DIAGRAM H - Corner Post Installation



4. Fit the corner post onto the walls to be clad at this time. It is advisable to cut the posts longer than the length required, the bottom can then be trimmed once the weatherboards are installed. This way the correct length is ensured.

If you are installing eave soffit lining, depending on how you intend to fit them, the corner length may have to be adjusted accordingly.

5. Internal corners should be finished with two J-trims and caulk/silicone seal to prevent water entry. Alternatively one J-trim can be used with an effective flashing behind.

Please also refer to Details section of this manual

17.3 STEP 3: STARTER STRIP

In order for the cladding to be installed properly and in a level fashion, the starter strip at the bottom of the wall must be level. Your starter strip must be straight, level and line up at the corners as this will determine whether the boards will line up on corresponding walls.

Check the whole building to ascertain the level at which the cladding will start. Measure the width of the starter strip from the lowest point of the wall that you're cladding (refer to diagram below). This will be the level which you'll set up your chalk line to mark the top of the starter strip.

Using a level, establish the corresponding point at the other end of the wall, marking it with the chalk line then fix the starter strip. Repeat this on all walls ensuring all corners match up and the last line matches the first line.

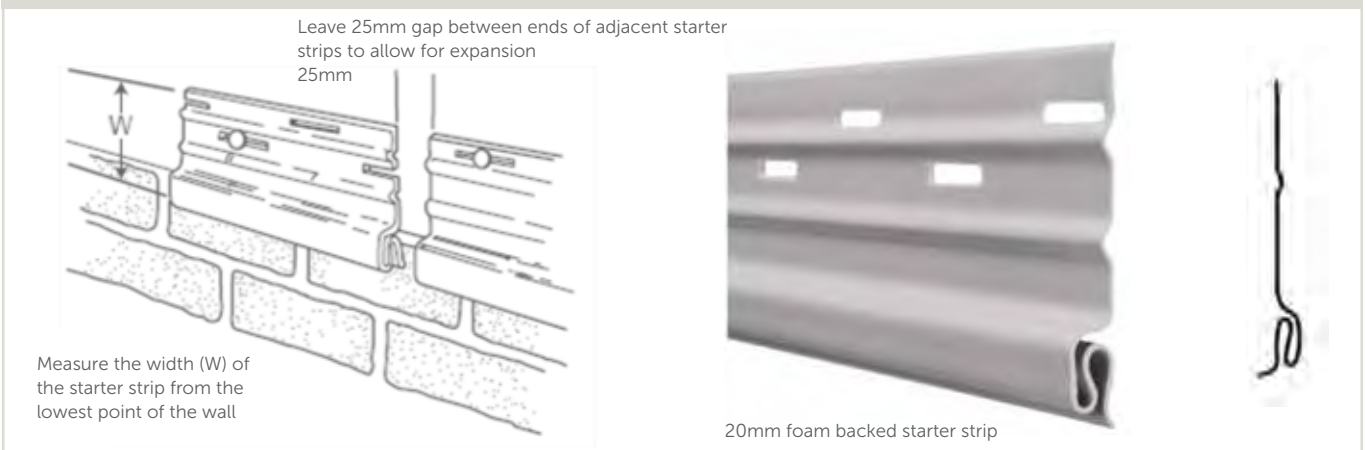
When fixing the starter strip it should be stopped short of all corners to allow the fixing of the corner post. Approx 75-100mm is acceptable.

Fix at 200mm intervals, always fix towards the centre of the slot as per correct fixing technique. Starter strips do not need to be overlapped as they cannot, or should not be seen.

Where there are patios, entrances or other variations of level that cause the bottom part of board containing the attachment portion to be removed, a J-trim has to be used to hold and cover the cut edge of the weatherboard.

Please also refer to Details section of this manual

DIAGRAM I - Starter Strip



17.4 STEP 4: WINDOWS, DOORS & ROOFLINES

Window Flashing

Apply the flashing on the underside of the window first.

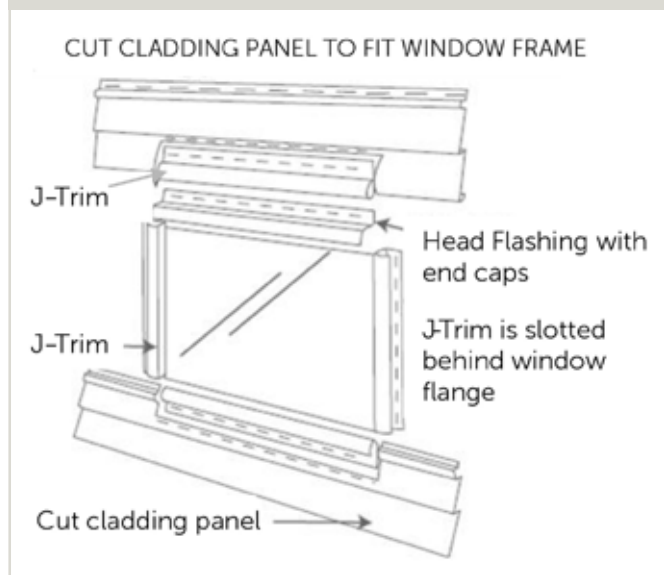
Follow this application with flashing on the sides of the window. Make sure you overlap the bottom flashing.

The flashing should be long enough to direct water over the nail flange of the last course of completed cladding panels.

3. Cut the side J-trim members longer than the height of the window or door and notch the trim at the top.
4. Mitre cut the free flange at a 45° angle and bend the tab down to provide flashing over the side members. A similar mitre and tab may be provided at the bottom of the window, depending on the condition of the sill. The J-trim should fit snug to the window.

Please also refer to Details section of this manual

DIAGRAM J - Window Flashing



Refer to window flashing details as per Figures 14, 15, 16 in details section of this manual.

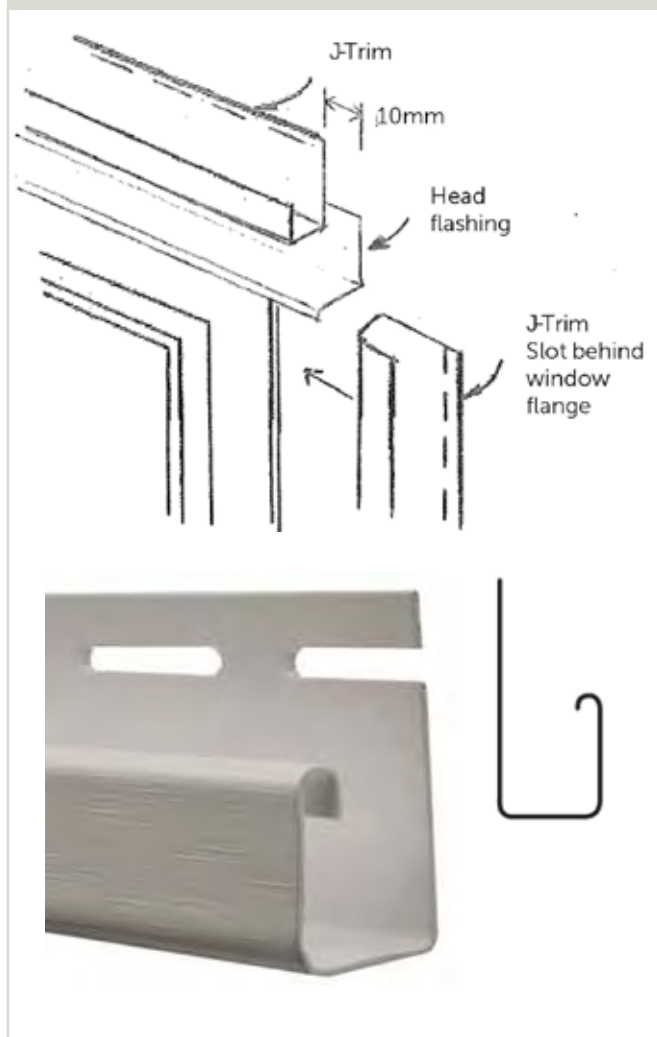
17.5 J-TRIM

J-trim is used around windows and doors to receive the cladding panels and are used to seal off cut edges as well as to cover the expansion clearance of the weatherboards. In addition, it acts as moisture flashing.

J-trims are cut and folded back into each other in such a way to allow trapped water to flow outside of the building. Timber window and doorsill horns are normally cut square to be flush with the outside edges of the architraves.

1. Cut and bend the tab of the top piece of J-trim down to provide flashing over the side J-trim.
2. Fold the bottom end of the side piece of J-trim inward at the bottom of the window, to fit over the existing J-trim to prevent water from entering under the sill.

DIAGRAM K - J-Trim



NOTE: Trim size vary for 20mm or 30mm foam boards.

20mm foam = 30mm wide J-trim

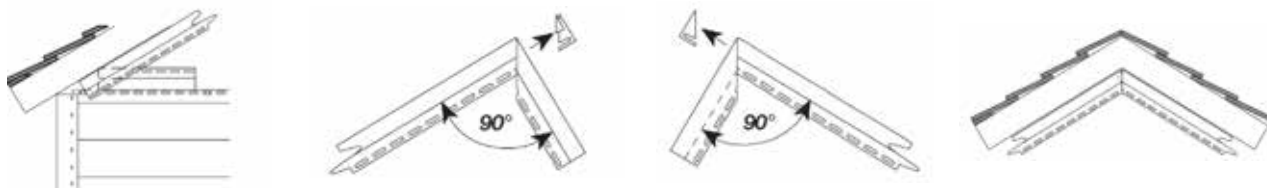
30mm foam = 40mm wide J-trim

17.6 INSTALLING J-TRIM AS GABLE END TRIM

Install J-trim to receive cladding at gable ends as illustrated here.

1. To create an angle template, hold a piece of J-trim against the slope while transferring the angle to another J-trim with a pencil.
2. Next, transfer angle of template to the end of a length of J-trim. Be sure to extend line onto fixing flange. Cut away trim face and nail flange.
3. Turn pattern over and transfer opposite angle to second J-trim, being sure to extend line onto fixing flange. Cut away fixing flange and return lip, but do not cut J-trim face.
4. Insert the full-faced J-trim into the mitred J-trim. If the fixing flange or return lips butt and prevent a tight fit, trim off additional material from the second J-trim.

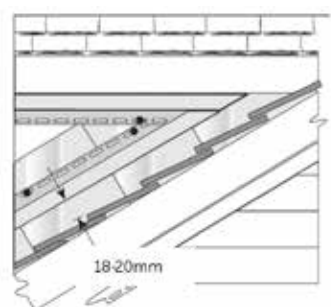
DIAGRAM L - Installing J-Trim as Gable End



17.7 INSTALLING TRIM AT ROOF LINE

To prevent water infiltration along the intersection of roof and wall, install flashing before installing J-trim. At points where vinyl cladding and accessories will meet at a roof line – such as areas where a gable dormer or a second story side wall intersect with the roof – it's best to position the J-trim so it's approximately 18-20mm away from the roof line (refer to diagram below). Placing the J-trim directly on the roof line would subject it to a build-up of heat, which could result in excessive expansion.

DIAGRAM M - Trim at Roofline



Chalk a straight line up the roof flashing to guide J-trim installation. Overlap the J-trim (lapping the upper piece over the lower piece) if it is necessary to use more than one piece. Extend the J-trim past the end of the roof, channelling water into the gutter, in order to ensure proper run-off. Fasten the screw that

is closest to the roof line at the far end of the fixing hem slot to ensure that cladding will expand away from the J-trim.

NOTE: With dark roofing material or a North exposure, it is recommended to either use a metal J-trim or install the vinyl J-trim as far away from the roofing as is aesthetically acceptable, having first ensured that there is sufficient flashing behind the J-trim to prevent water infiltration.

17.8 TOP OF WALL FINISH

Cladding is measured and finished off at the top of the wall in exactly the same fashion as under a window or door, except that full sheets of cladding will be used.

To finish cladding on gables install a J-trim along the gable angle against the soffit. Cut cladding to the proper angle and install siding in the J-trim leaving a gap for expansion. To secure the top board into the J-trim the crimping tool must be used.

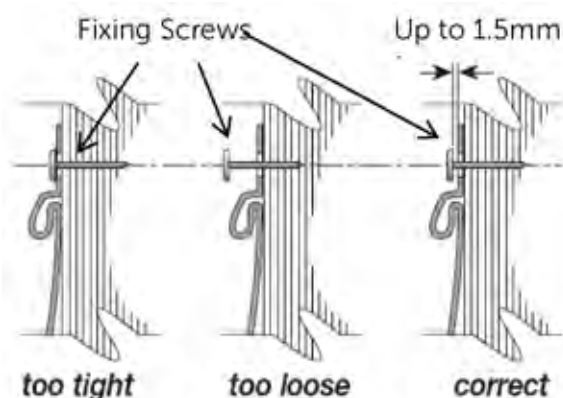
17.9 ADDITIONAL NOTES ON FIXING

If you want to ensure a quality vinyl cladding installation, focus your attention on proper fixing techniques.

Screwing is the most common way of fastening vinyl cladding to a wall. That's because it offers greater control, making it easier to learn how to fasten panels securely, but not tightly. The diagrams below illustrate proper fixing technique.

Please also refer to additional notes on Fixing throughout this manual.

DIAGRAM N - Correct Fixing Procedure



Above: Correct Screw Fixing Procedure

Please note that while nails are depicted above, screws are to be used as per all fixing instructions in this manual.



18.0 INSTALLATION: WEATHERBOARD

18.1 STEP 5: INSTALLATION OF WEATHERBOARD

The key to successful vinyl cladding application is proper preparation of the fixing surface. It is essential that you work over a smooth fixing surface. The more level and even the wall surface, the better the finished installation will look.

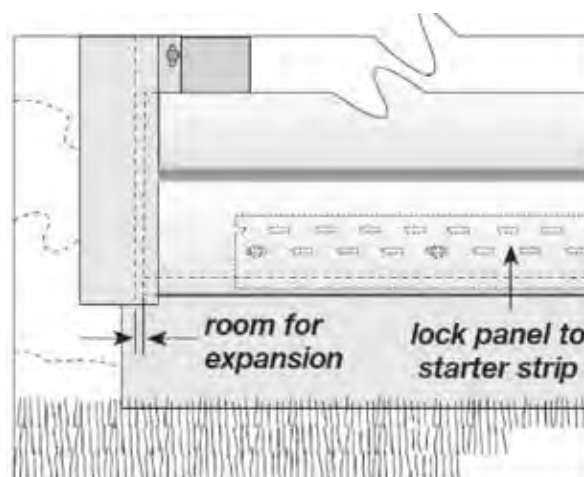
INSTALLING THE FIRST COURSE

It's important to work with care and planning as you install the cladding panels. This is especially true when you're installing the first course of cladding. (See page 7 for fastening methods).

For best results, follow these guidelines:

Before starting installation take into consideration the prevailing weather and visual views of the finished wall. The key to creating a visually attractive installation is to lap away from areas where people normally walk or gather.

DIAGRAM O - Installing the first course

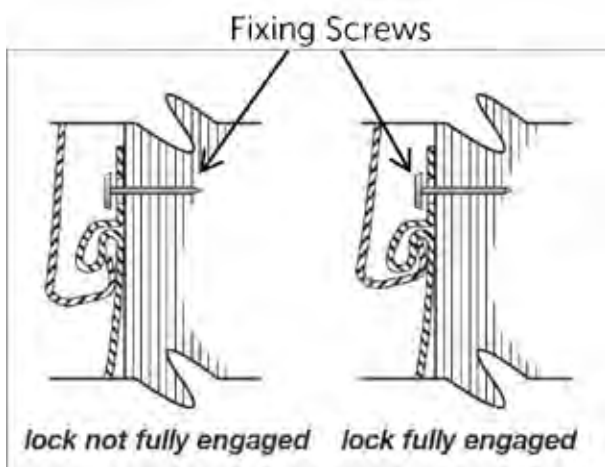


GOOD JOINS IN THE RIGHT DIRECTION ARE BARELY NOTICEABLE.

For example, on the front wall, work from the corners to the entrance door (so overlaps face away from door). On side walls, the overlaps should face the rear and on front and back walls overlaps should face away from pedestrian entrances. This approach minimises the effect of lapping and produces the best appearance. **Keep lap appearance in mind throughout installation.**

1. The first row of panels you install should be placed in the starter strip and securely locked along the entire length of the siding. Making sure the panel is securely locked before fastening.

DIAGRAM P - Locking cladding panels



2. Fasten the panels in the centre of the fixing slots (refer to page 12) ensuring that the appropriate allowances are made for expansion and contraction.
3. Do not drive the head of the fastener tightly against the fixing slot. Do not force the panels up or down when fastening. Panel locks should be fully engaged; however panels should not be under vertical tension or compression when they are fastened.
4. As vinyl cladding moves as the temperature changes, ensure the panels move freely in a side to side direction once panels are fastened.
5. Check every 3rd or 4th panel for horizontal alignment and check cladding alignment with adjoining walls.
6. When panels overlap ensure they overlap by one half of the length of the notch at the end of the panel. Mitten Vinyl cladding has a factory end for vertical joining. Remove polystyrene and trim back top starter strip to provide 10mm gap between panels. Refer to information on overlapping panels on page 25.

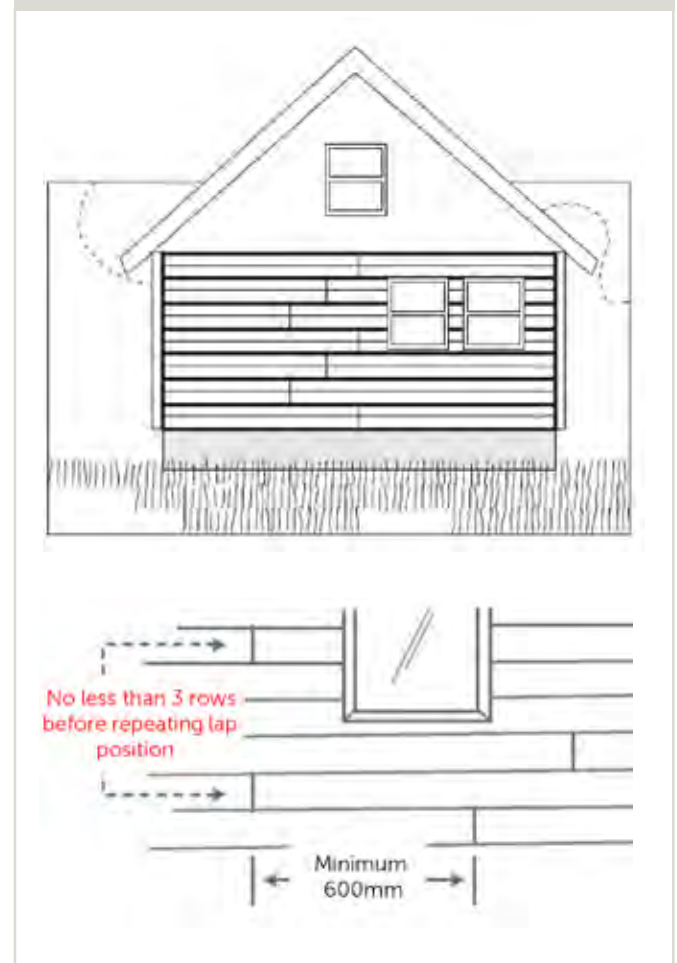
18.2 INSTALLING REMAINING COURSES AND STAGGERING JOINS

To ensure best appearance, position the laps to avoid unsightly joint patterns. The illustration below shows a well planned staggering of panel joints.

DO NOT put two or more joins together in a vertical line directly above each other. **DO NOT** join pieces of cladding which are shorter than 700mm and always span two complete studs to ensure maximum length and adequate nailing. Avoid joints above and below windows.

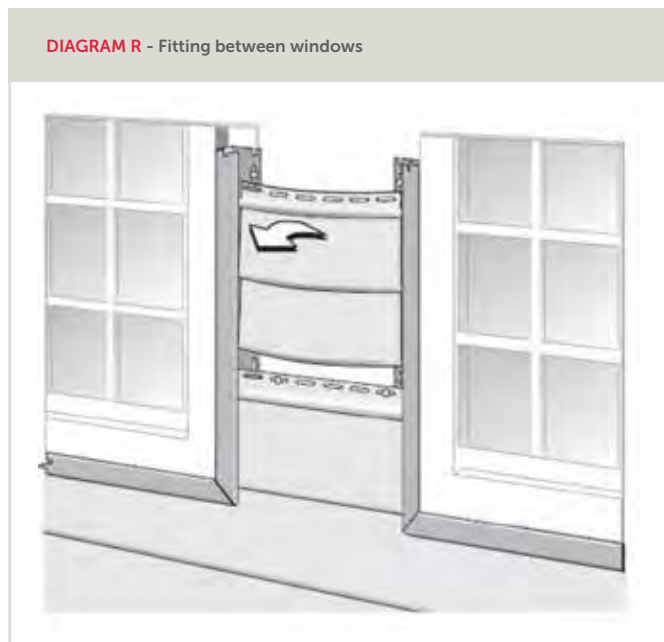
Refer to Joining Sequence in the details section of this guide. Use short cut-off lengths for fitting at narrow openings between windows. Follow the planned pattern when applying the next courses of cladding.

DIAGRAM Q - Staggering Joins



18.3 FITTING AT NARROW OPENINGS BETWEEN WINDOWS

- a) To simplify installation in areas such as that shown in the illustration below, install J-trim on both sides of opening. Bow the panel toward you and slip into channel. Bow the panel toward you and slip into channel.



NOTE: If the area is very narrow leave one J-trim unscrewed except at lowest point.

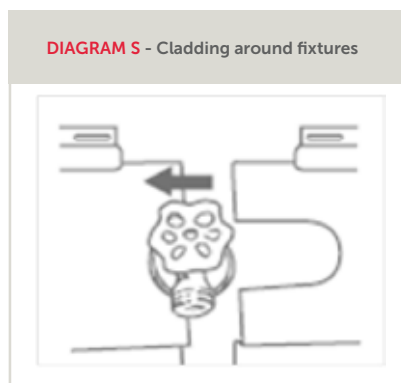
Bend this trim out slightly to insert panel.

When panel is in place and screwed, screw J-trim immediately above panel and repeat procedure.

Be sure to leave adequate tolerances for expansion and contraction.

18.4 COMPLETION

External fixtures and obstructions



All external products (downspouts, shutters, and lights, for example) are attached to walls after you've applied the vinyl cladding.

NOTE: All external fixtures must be attached to a solid backing (such as 20mm exterior grade plywood) to provide a secure mounting

surface. Never attach a fixture directly to vinyl cladding.

1. Always begin a new panel of cladding at the fixture to avoid excess lap joints.
2. Cut an opening approximately 5mm bigger than the opening of the fixture.
3. When installing external products, you must allow for expansion and contraction of cladding.
4. When attaching fixtures, drill holes in the siding three times the diameter of screws, bolts, or nails being used to fasten objects. This provides adequate clearance so cladding can move freely underneath attached objects. When attaching objects, do not fasten tightly.
5. It is also recommended that you apply sealant around the screws.

18.5 OVERLAPPING CLADDING PANELS

Factory notches should be used for all overlaps where possible.

The foam is glued to within 63.5mm of the end of the factory cut to allow the overlap to be tucked behind the foam for a perfect lap.

Make sure the panels slide freely when engaged with the foam. View figures 1, 2 & 3. Refer to page 14, 15.0 for expansion and contraction allowances.

OVERLAPPING

If you need to cut an overlap you must:

FIGURE 3
- Front view

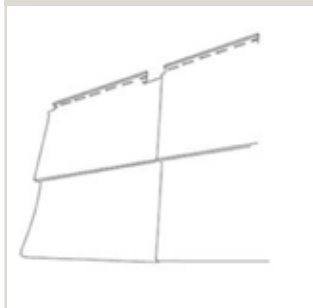
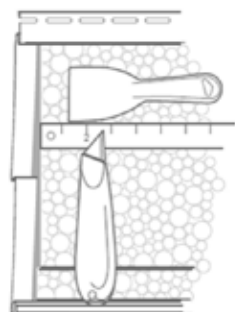


FIGURE 4

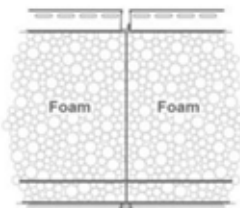


a) Trim and remove the foam 25mm back from the cladding end (figure 4)

FIGURE 1
- Use factory notches (rear view)

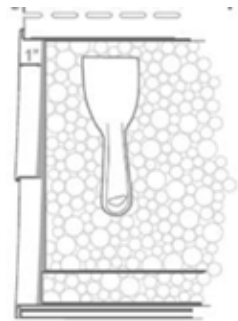


FIGURE 2
- Connect cladding panels (rear view)



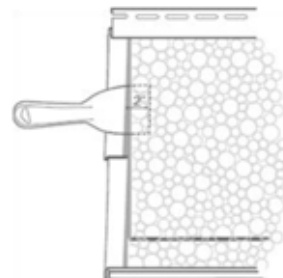
Refer to 15.0, Page 14 of this manual for specific allowances for expansion and contraction.

FIGURE 5



b) Clean the adhesive tracks using a paint scraper to ensure a proper lap (figure 5). Remove all foam particles and adhesive residue.

FIGURE 6



c) Slip the paint scraper between the foam and the panel (figure 6) approximately 50mm, creating an insert similar to the Mitten factory joint. Slip paint scraper between foam and panel 50mm. Insert the panel as illustrated in the 'Overlapping Panels' section making sure all free foam particles are removed so they won't get behind the panel and cause surface distortion. Make sure the panels slide freely once inserted behind the foam.

19.0 DETAILS | CAMBRIDGE PROFILE

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Additional CAD details are available from Vinyl Cladding New Zealand Ltd, New Zealand suppliers of Mitten Vinyl – if there is a detail you require which is not featured here please contact us on:

info@vinylcladding.co.nz | 0800 Mitten

FIGURE 1 - Elevation of Weatherboard

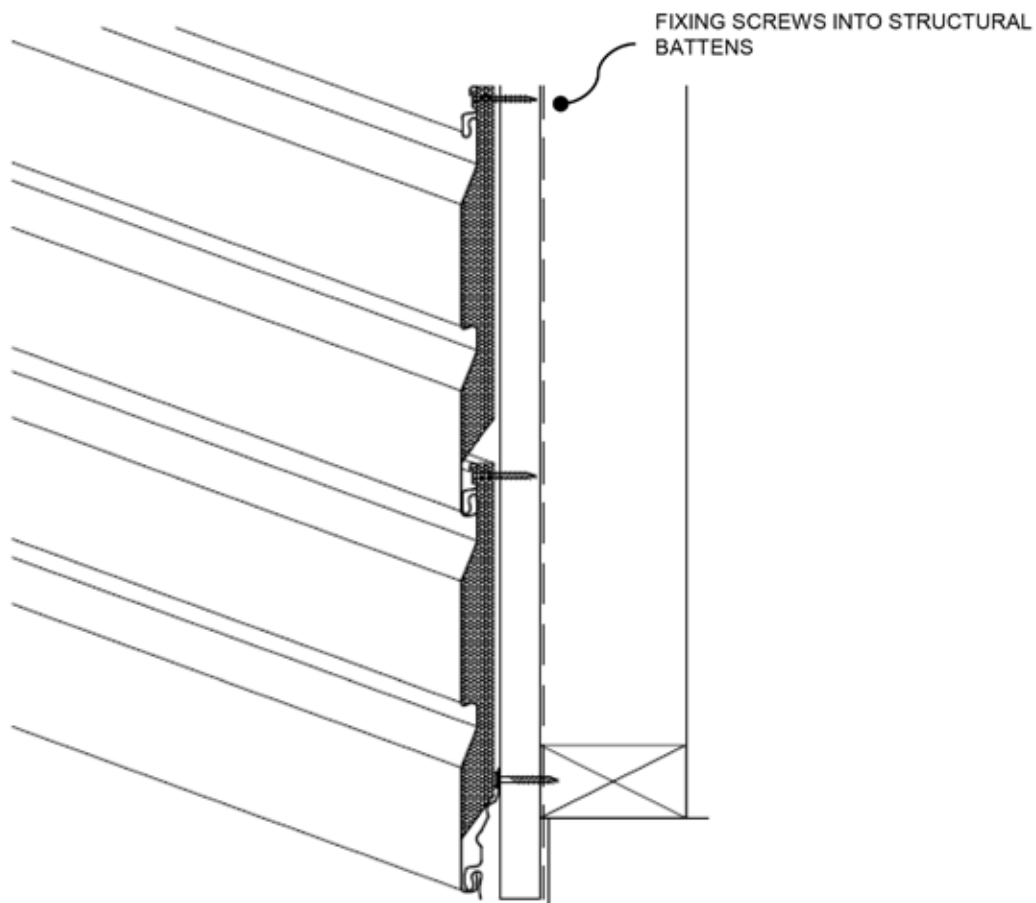
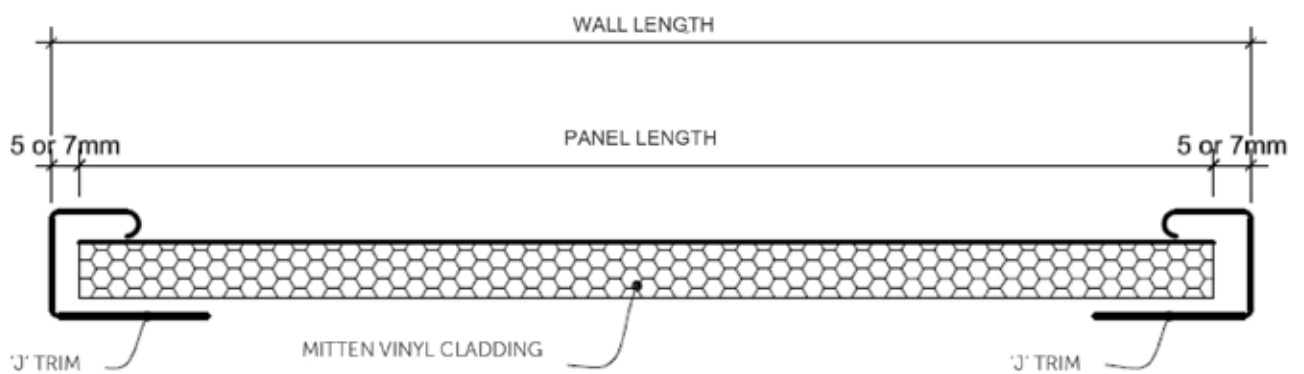


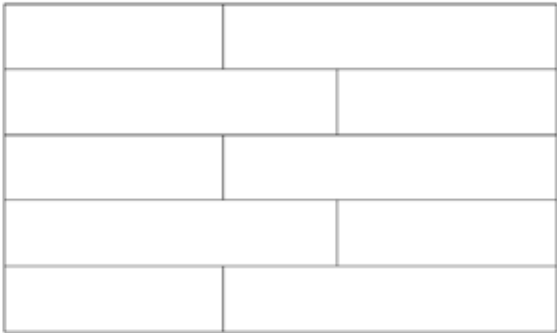
FIGURE 2 - Plan view of installed Weatherboard between two J-Trims



NOTE:

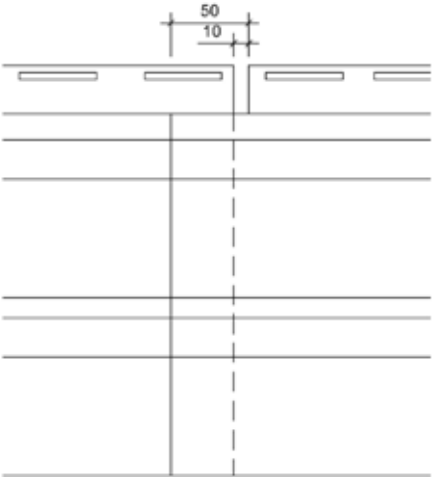
- 5MM CLEARANCE IN TEMPERATURES OVER 20 ° CELSIUS
- 7MM CLEARANCE IN TEMPERATURES UNDER 20 ° CELSIUS

FIGURE 3 - Joining Sequence of weatherboards



JOINING SEQUENCE

FIGURE 4 - Weatherboard jointing lap



VERTICAL PANEL JOIN

FIGURE 5 - Cross-section of Weatherboard

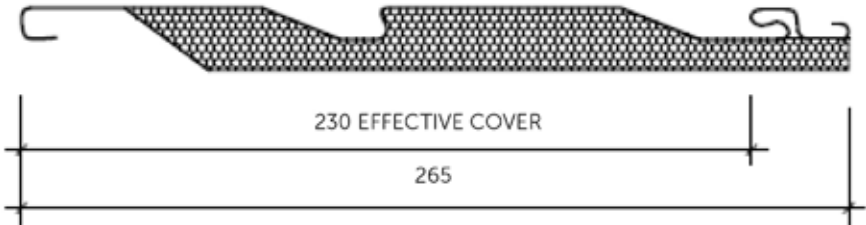


FIGURE 6 - Cavity Fixed Base Detail

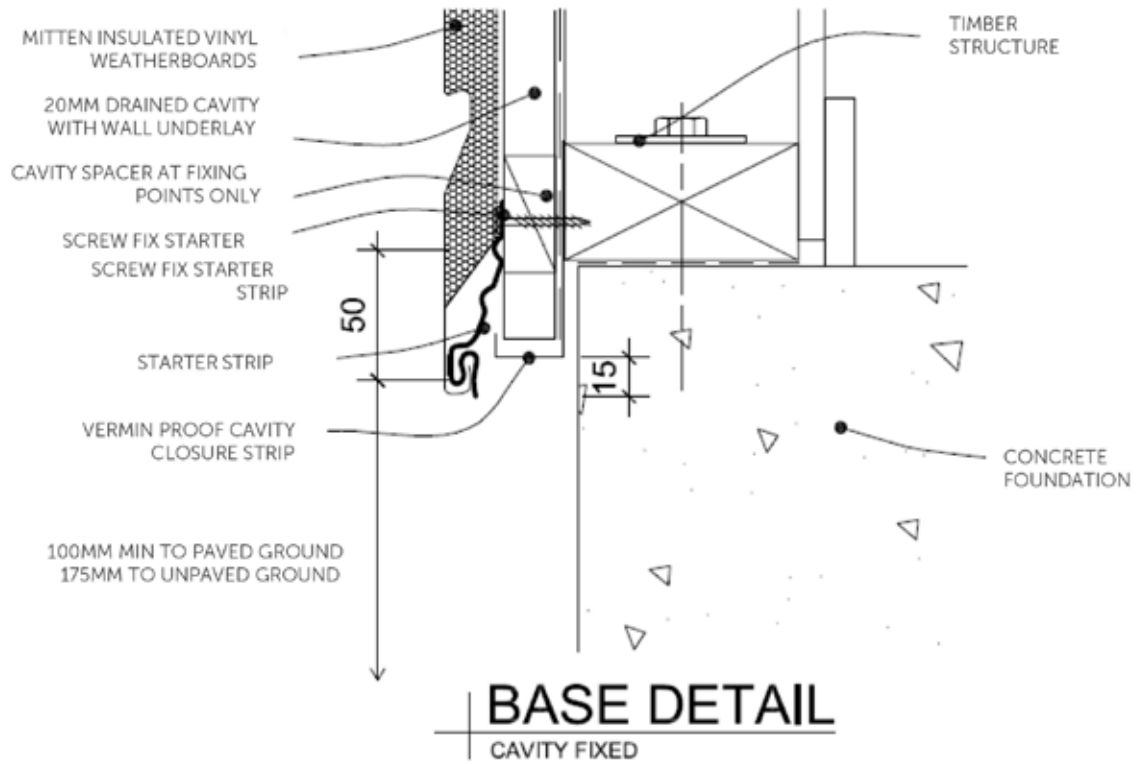


FIGURE 7 - Cavity Fixed External Corner Detail

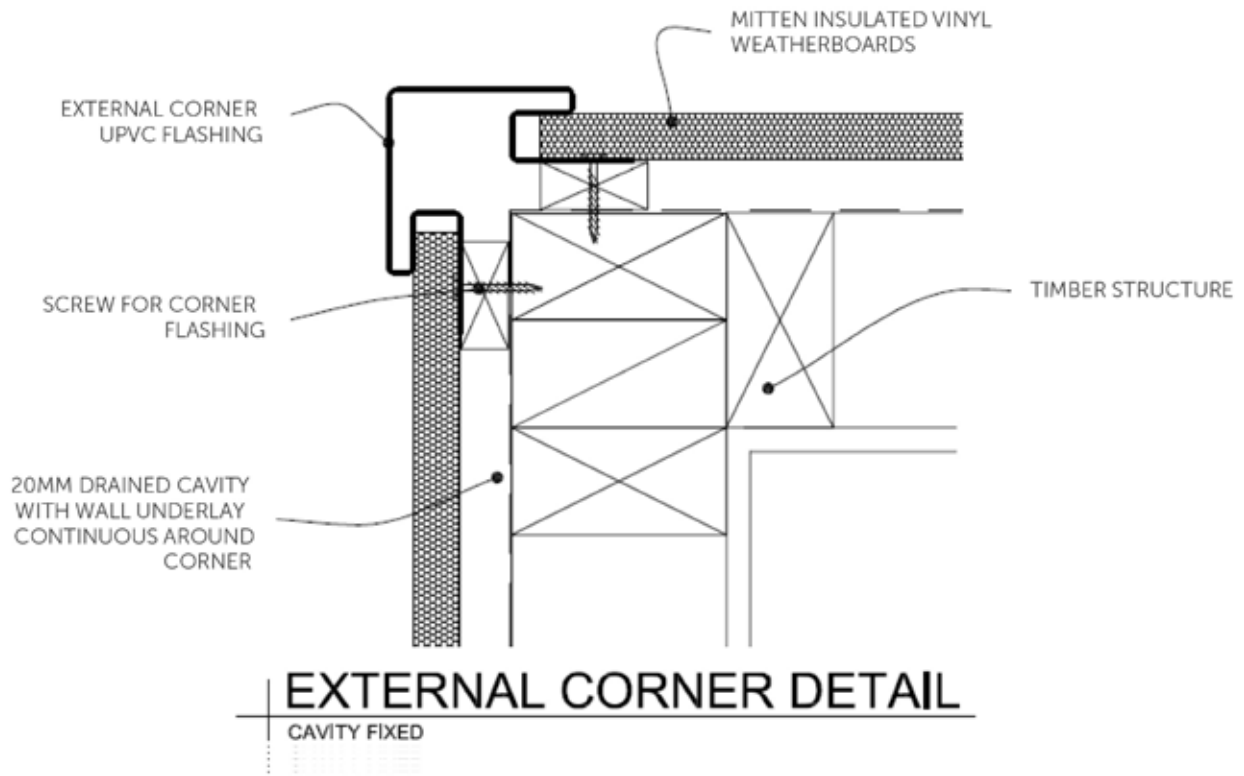
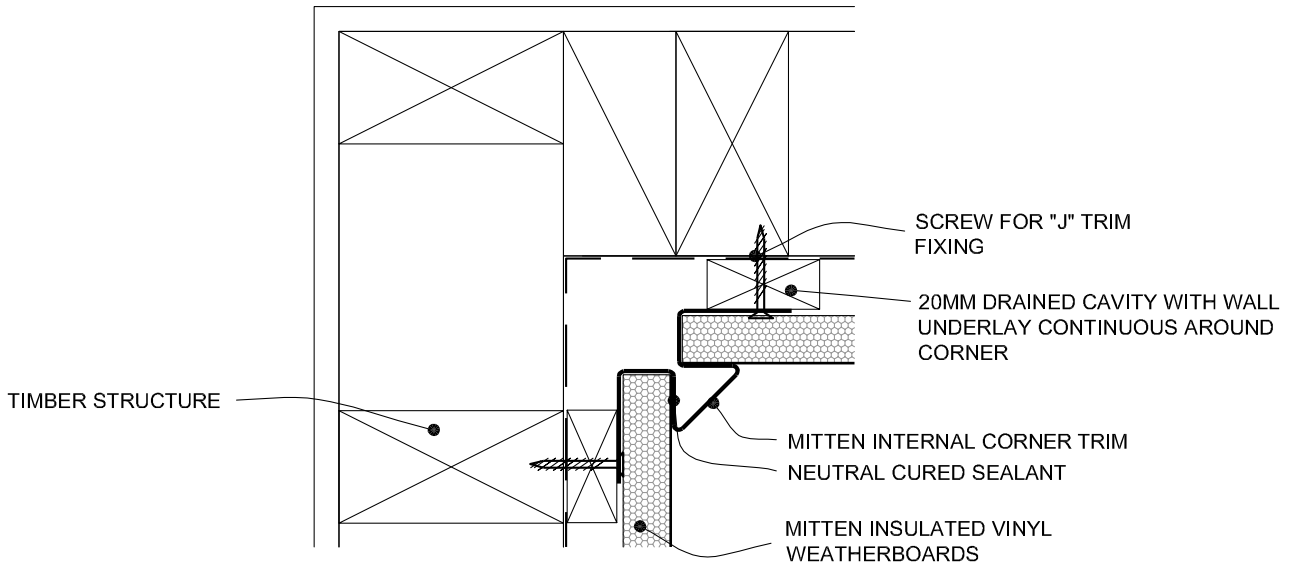


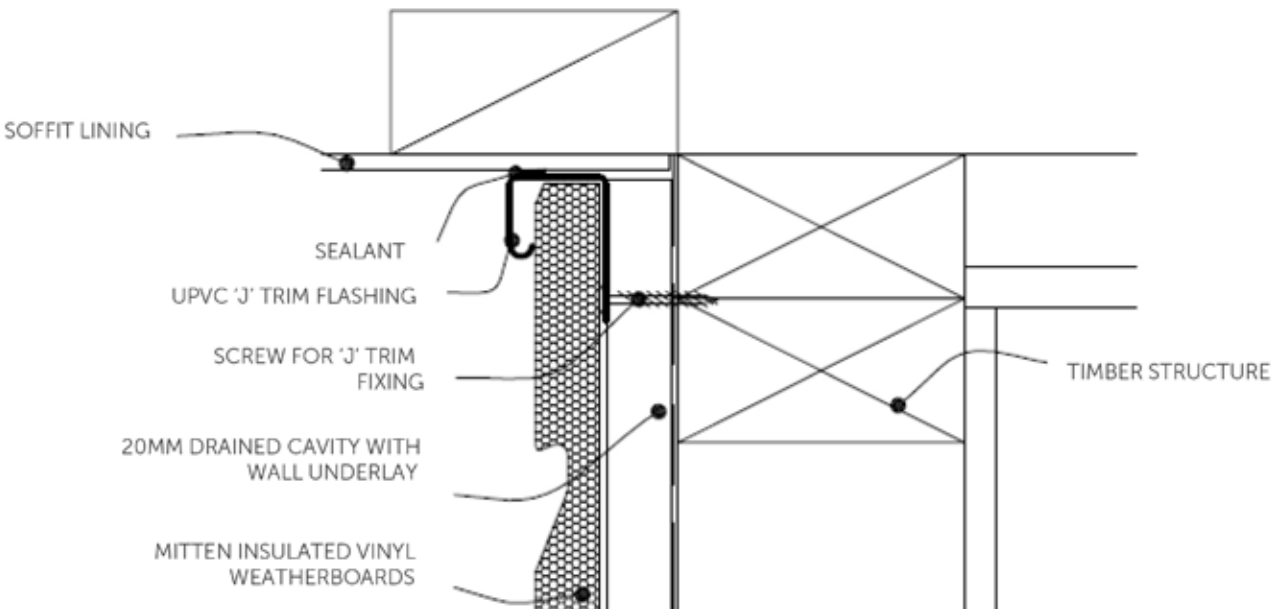
FIGURE 8 - Cavity Fixed Internal Corner Detail



INTERNAL CORNER DETAIL

CAVITY FIXED

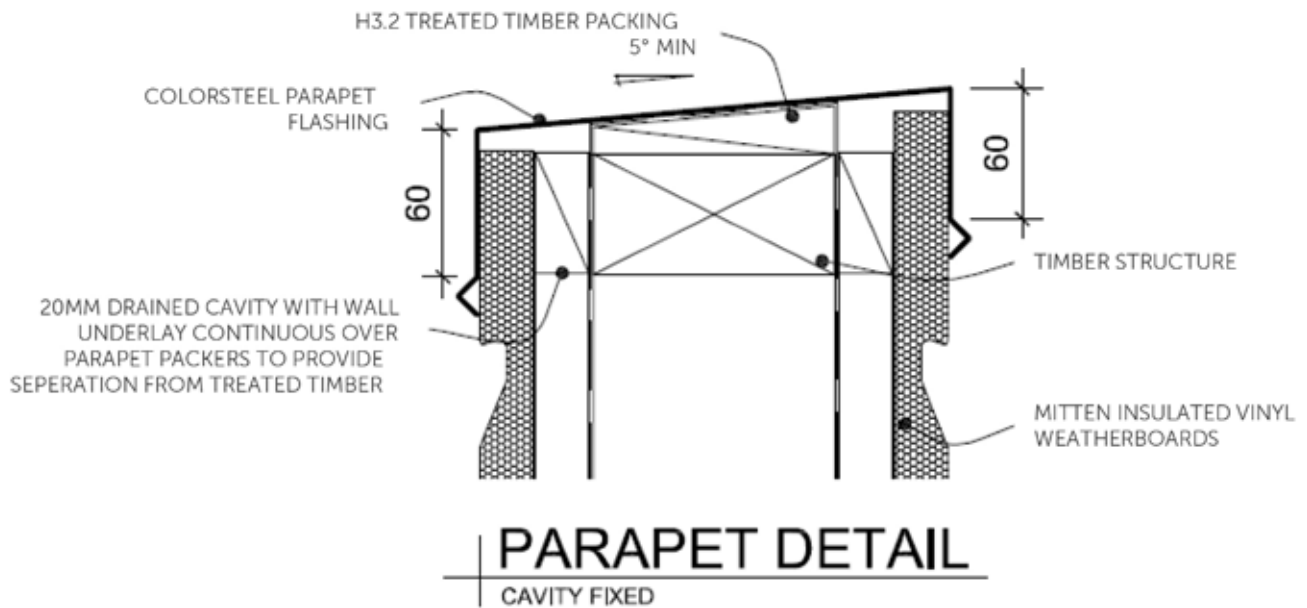
FIGURE 9 - Cavity Fixed Soffit Detail



SOFFIT DETAIL

CAVITY FIXED

FIGURE 10 - Cavity Fixed Parapet Detail



NOTE: Refer to E2/AS1 Table 7 for minimum flashing cover dimensions

FIGURE 11 - Cavity Fixed Meterbox Sill Detail

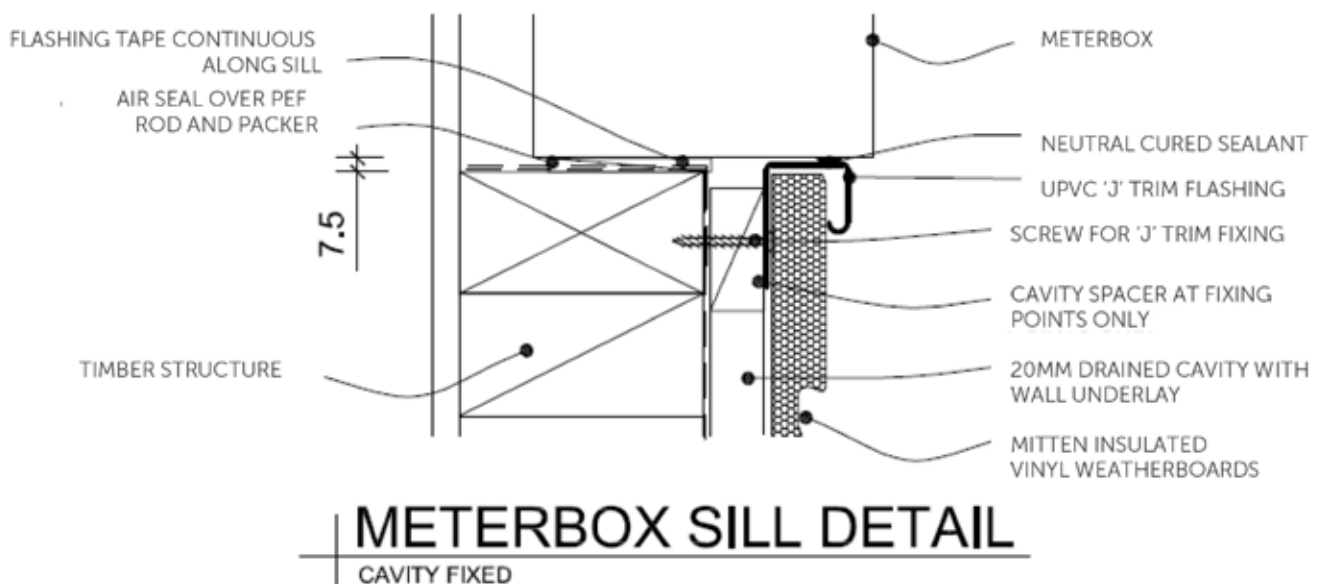


FIGURE 12 - Cavity Fixed Meterbox Jamb Detail

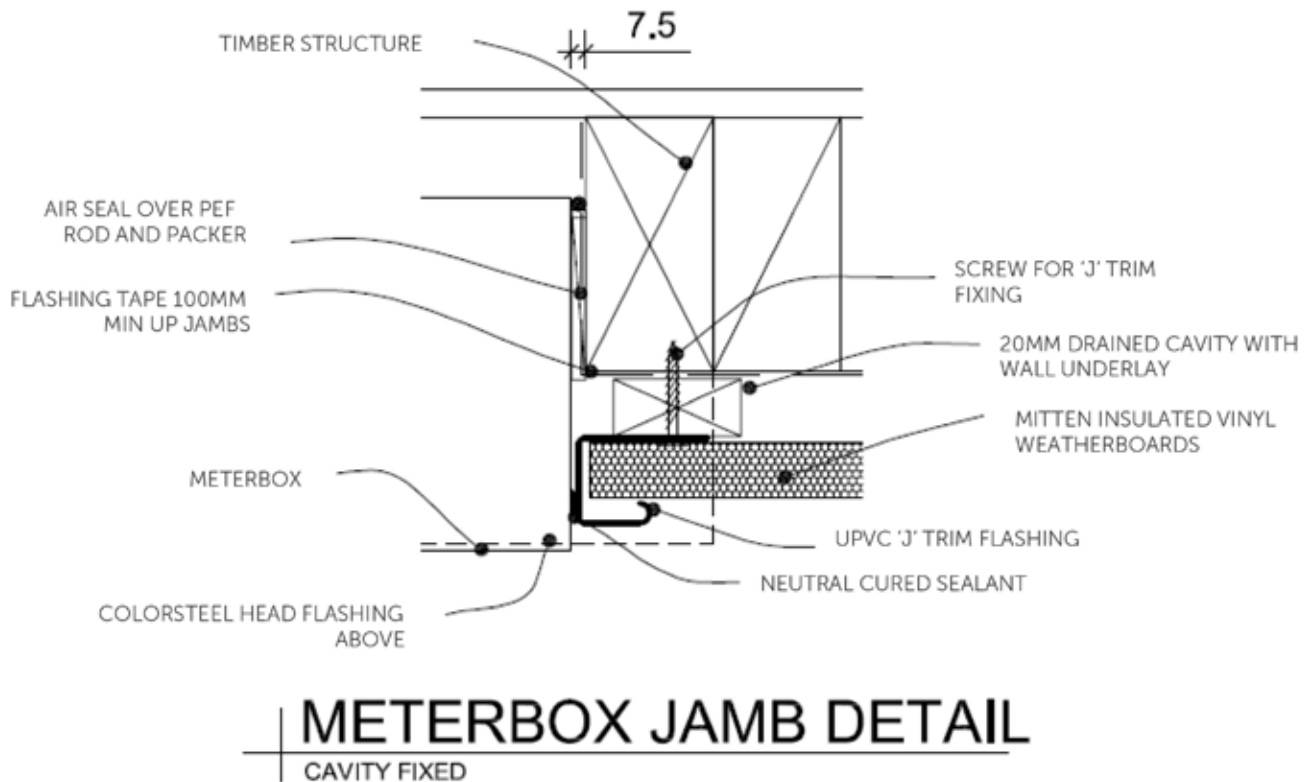


FIGURE 13 - Cavity Fixed Meterbox Head Detail

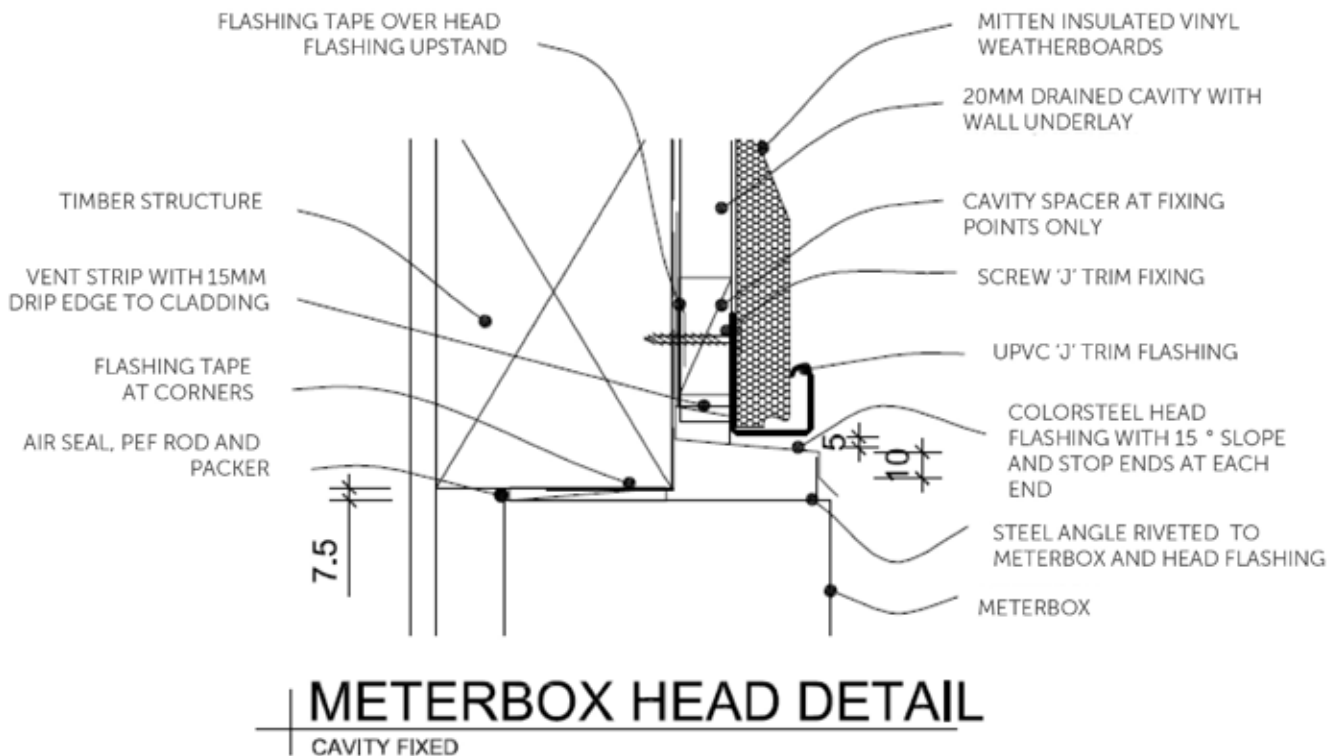


FIGURE 14 - Cavity Fixed Joinery Head Detail

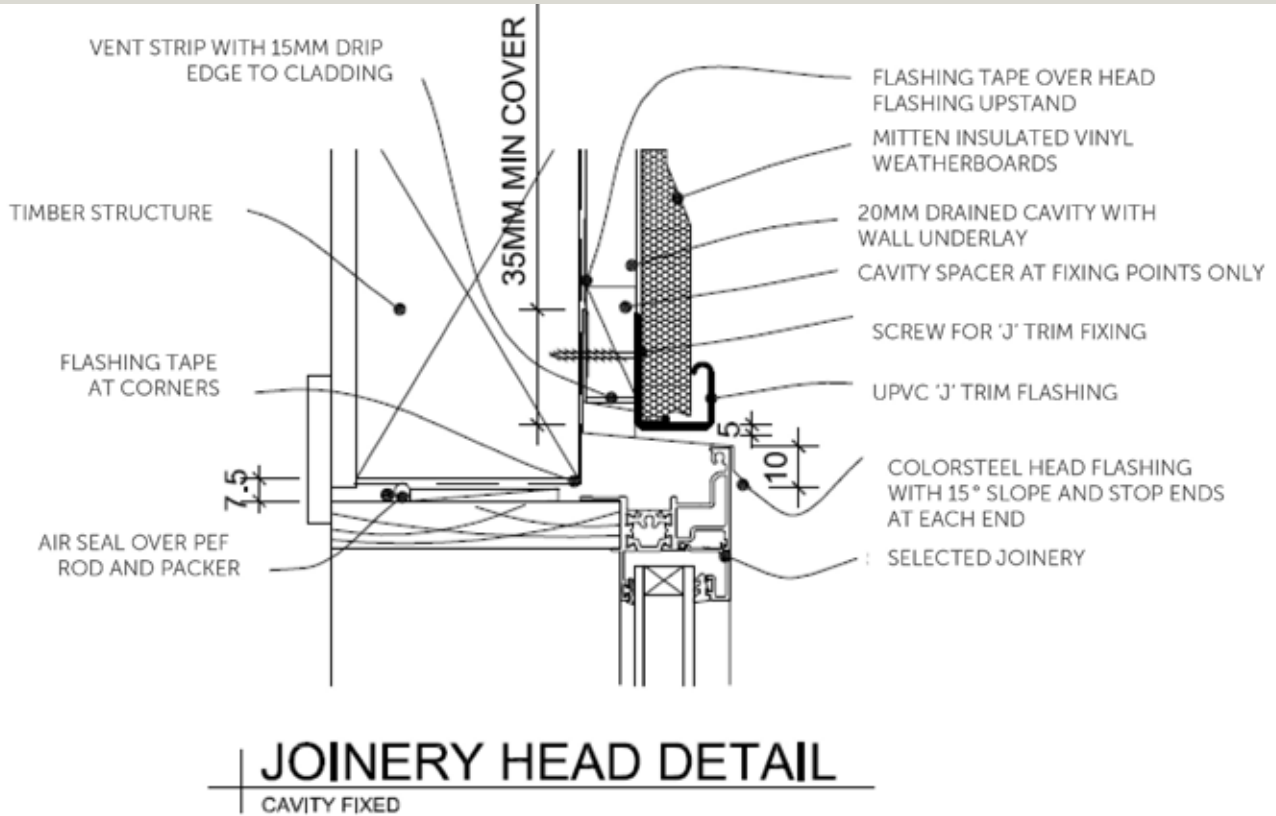


FIGURE 15 - Cavity Fixed Joinery Jamb Detail

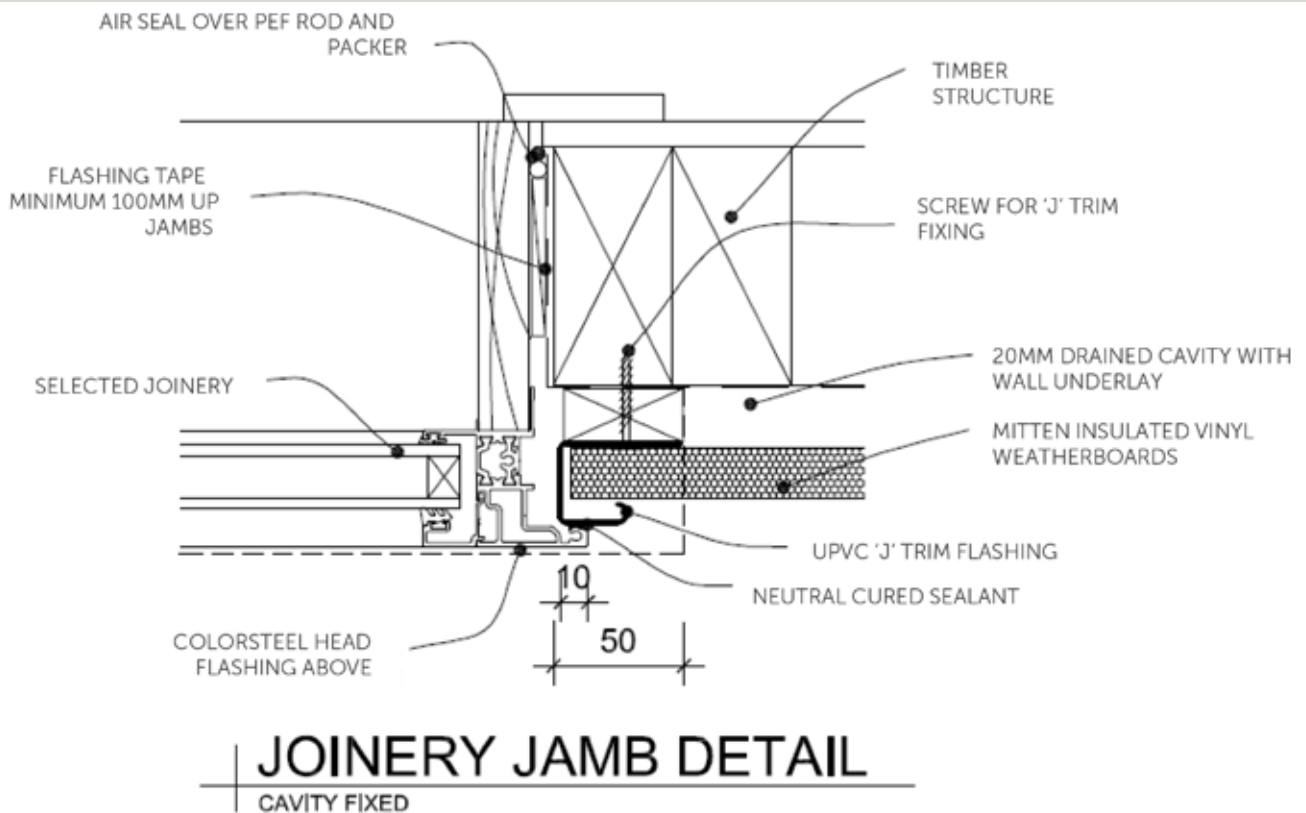


FIGURE 16 - Cavity Fixed Joinery Sill Detail

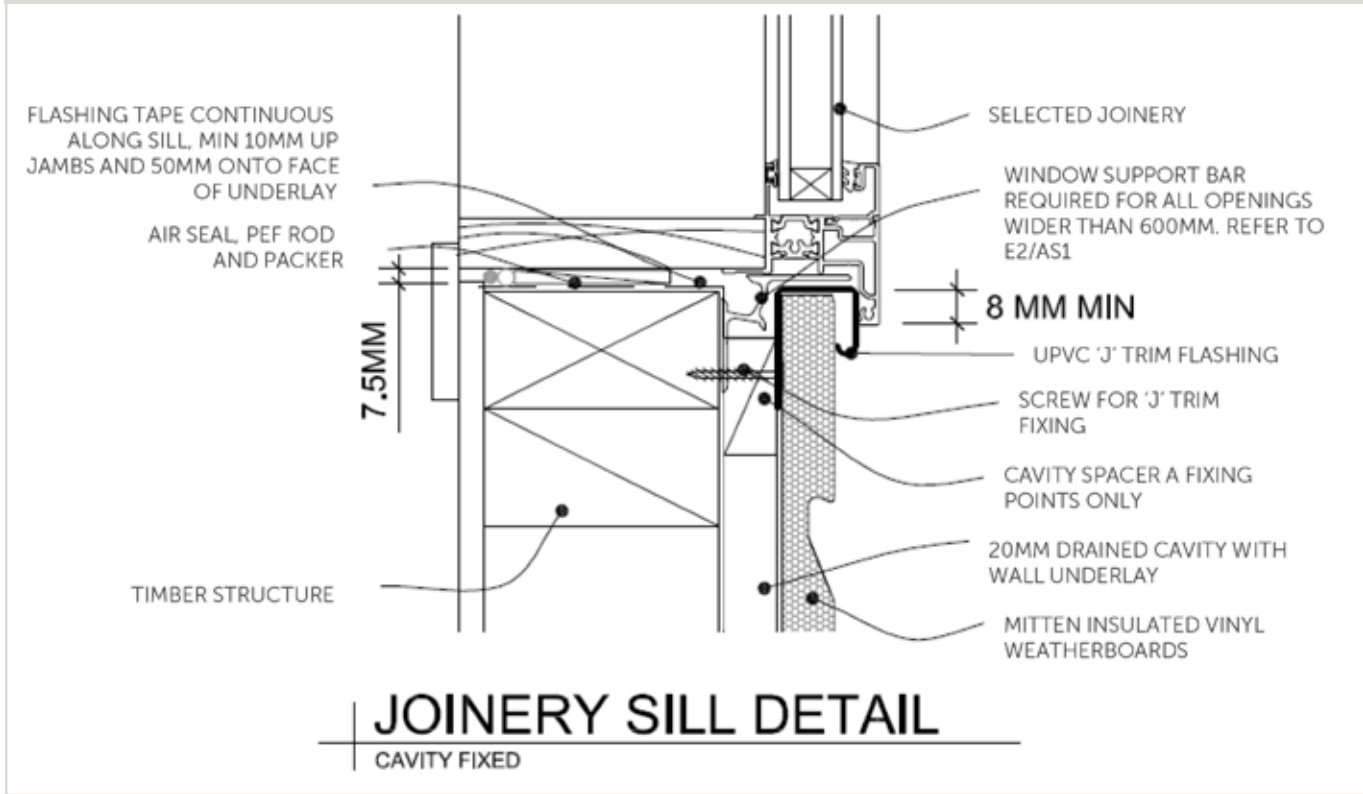


FIGURE 17 - Pipe Penetration

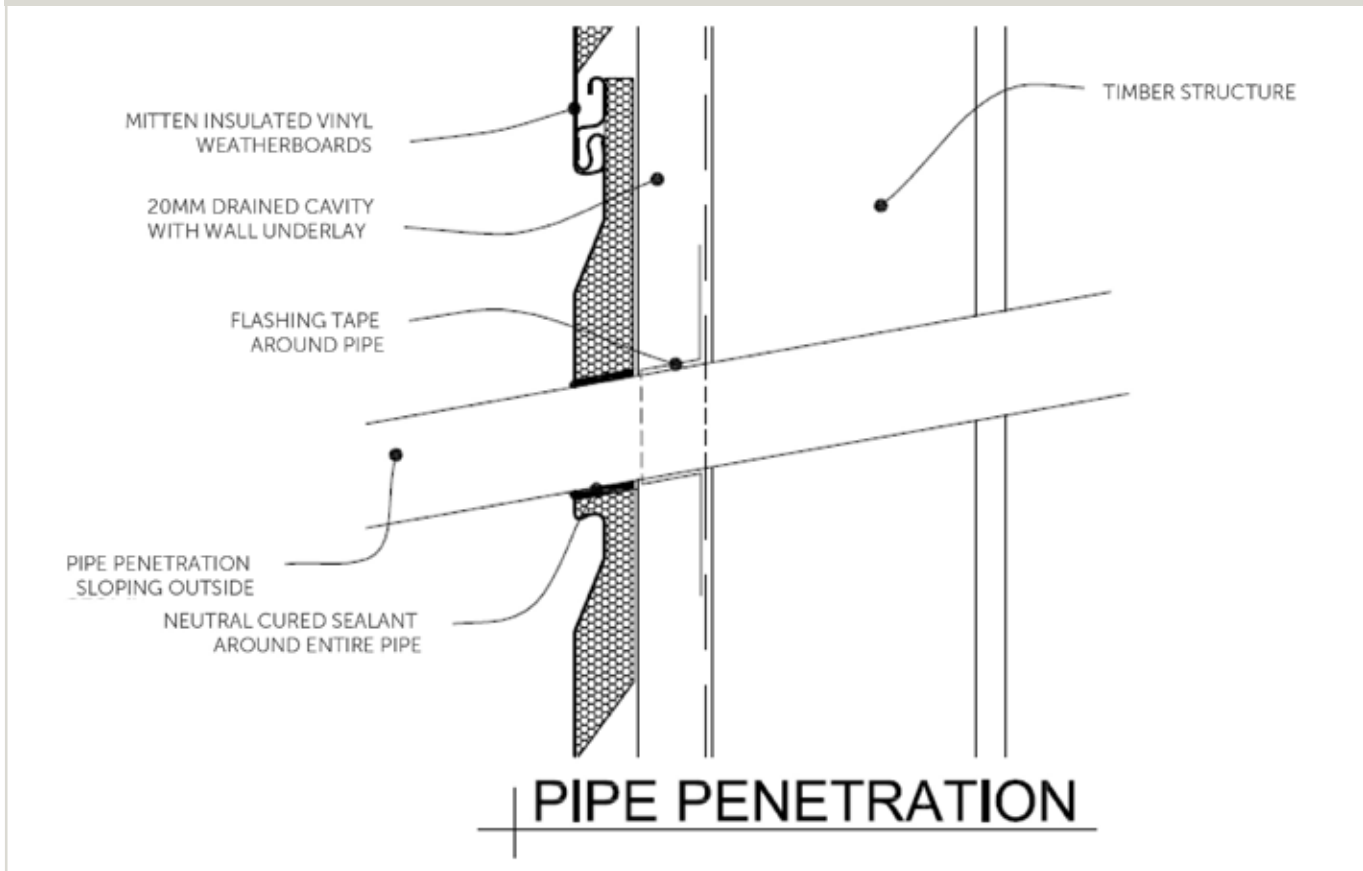


FIGURE 18 - Cavity Fixed Brick Veneer Junction Detail

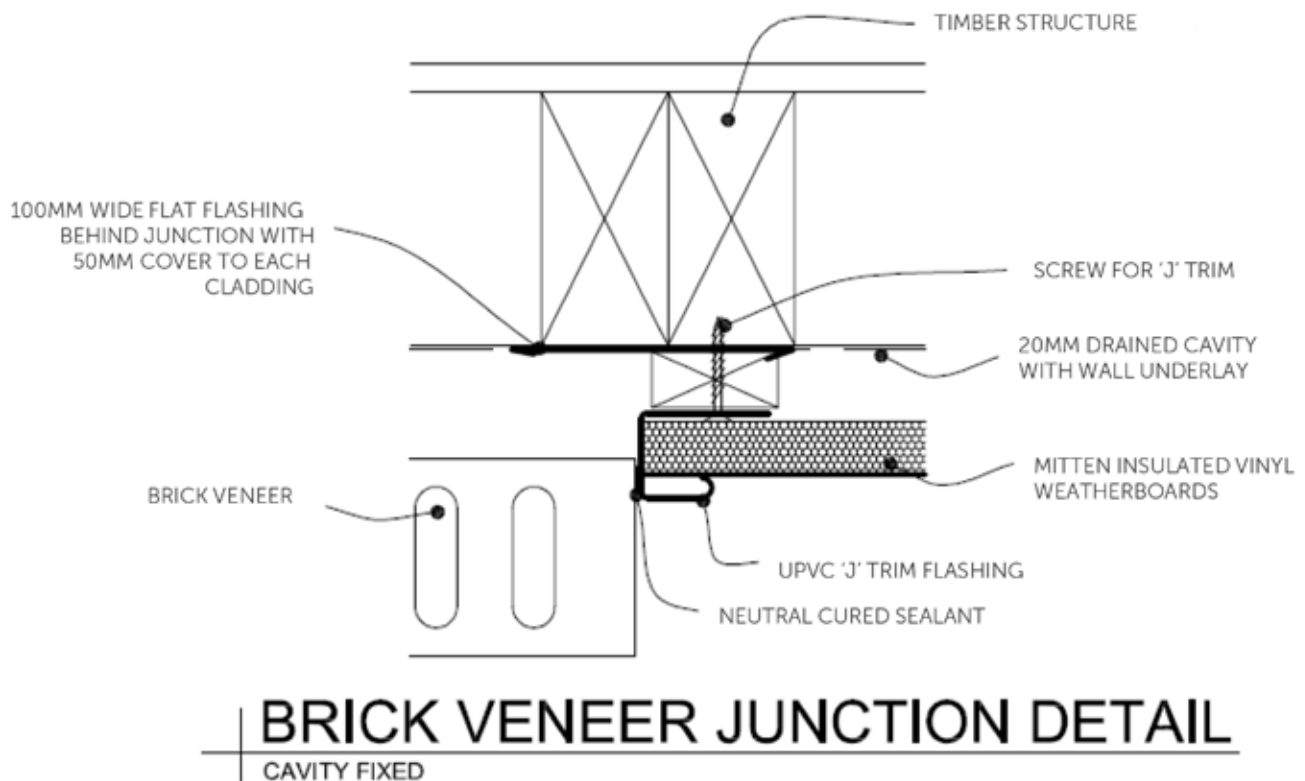


FIGURE 19 - Cavity Fixed Vertical Profiled Metal Junction Detail

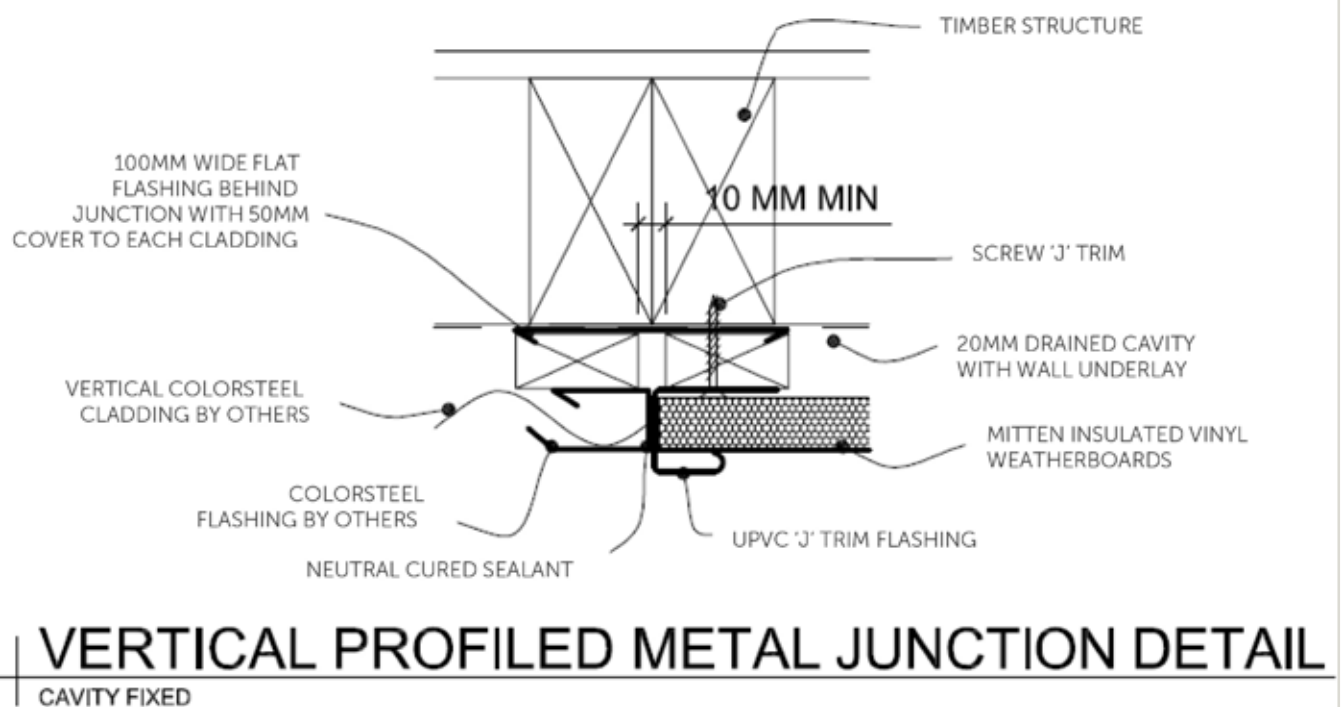
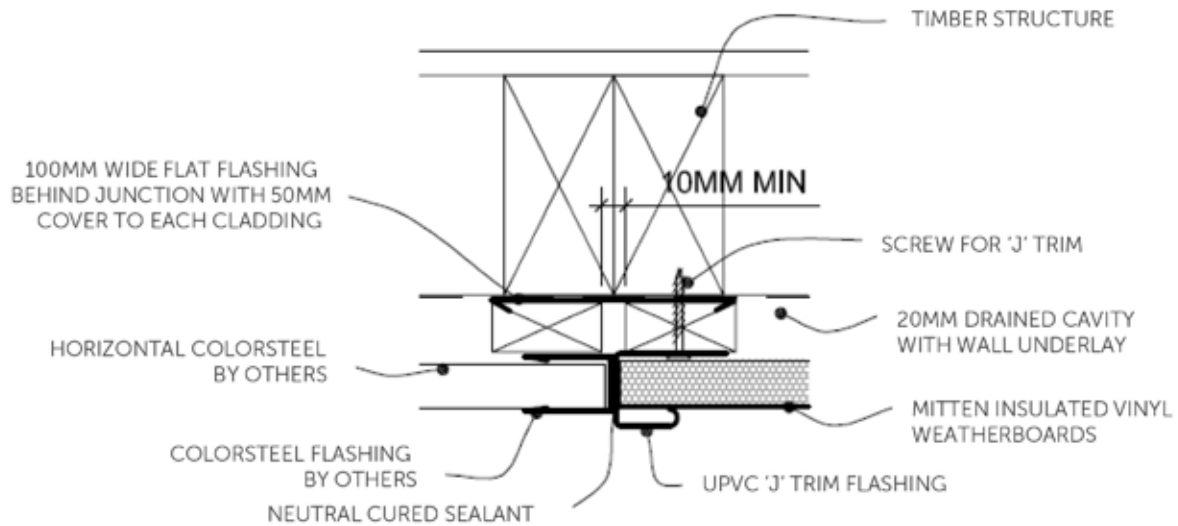


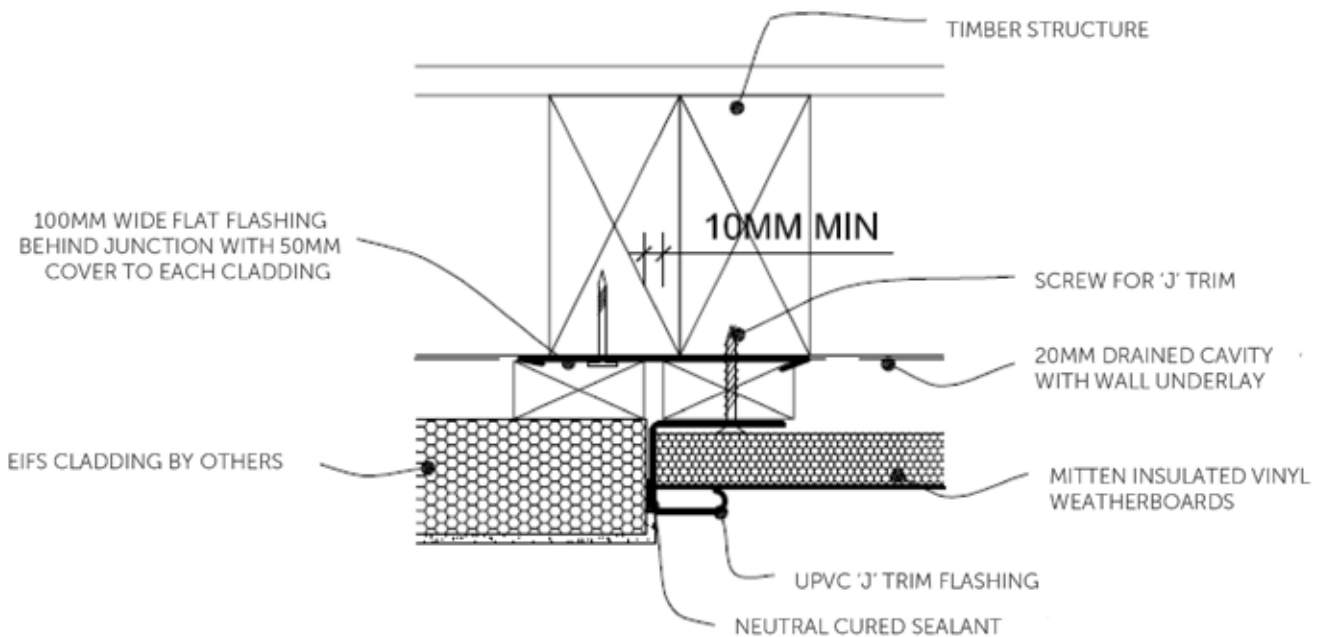
FIGURE 20 - Cavity Fixed Horizontal Iron Junction Detail



HORIZONTAL PROFILED METAL JUNCTION DETAIL

CAVITY FIXED

FIGURE 21 - Cavity Fixed Eifs Junction Detail



EIFS JUNCTION DETAIL

CAVITY FIXED

FIGURE 22 - Cyclone Washer

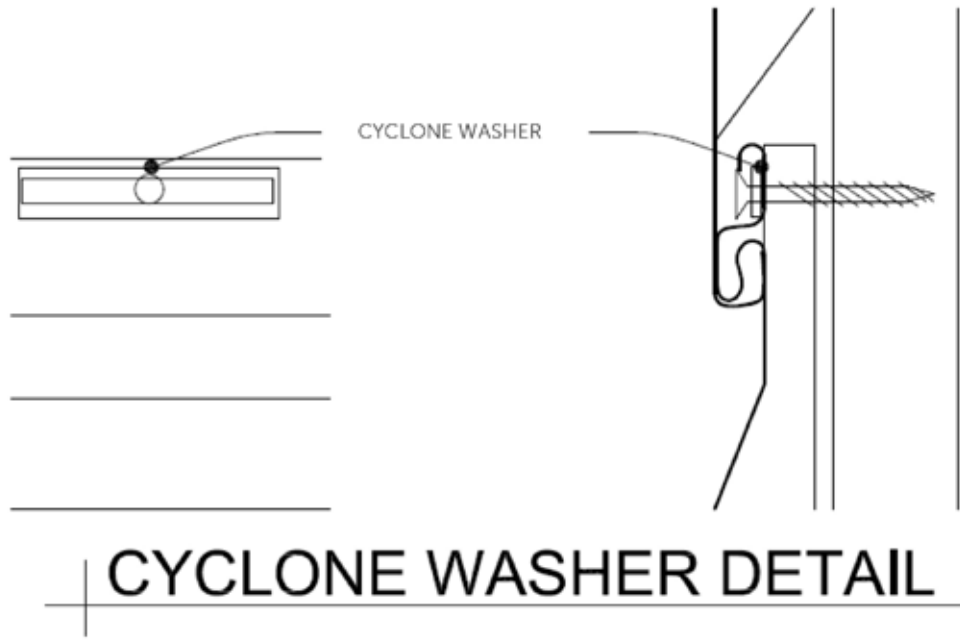


FIGURE 23 - Roof to Wall Junction Parallel

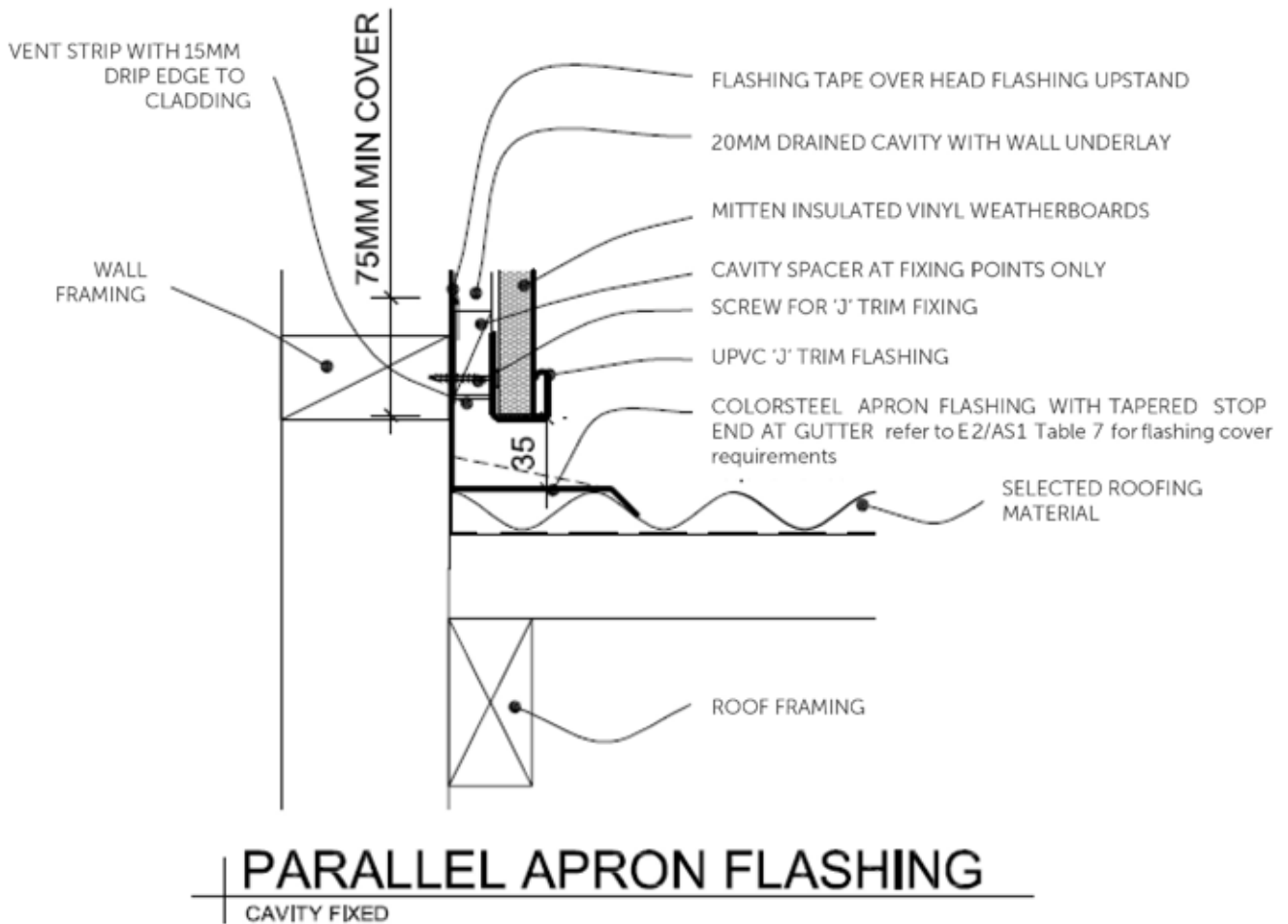


FIGURE 24 - Roof to Wall Junction Perpendicular

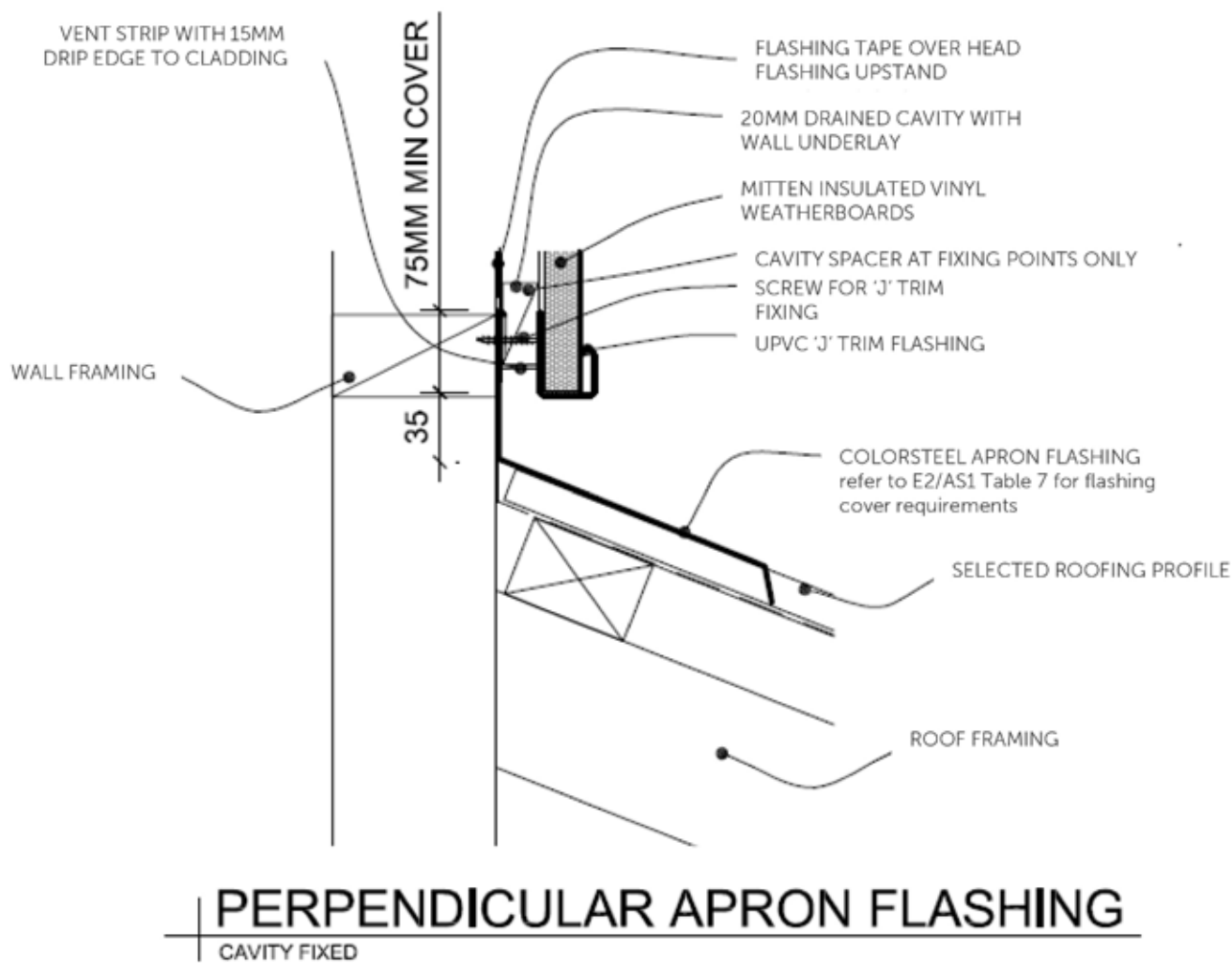


FIGURE 25 - Garage Door Head Detail

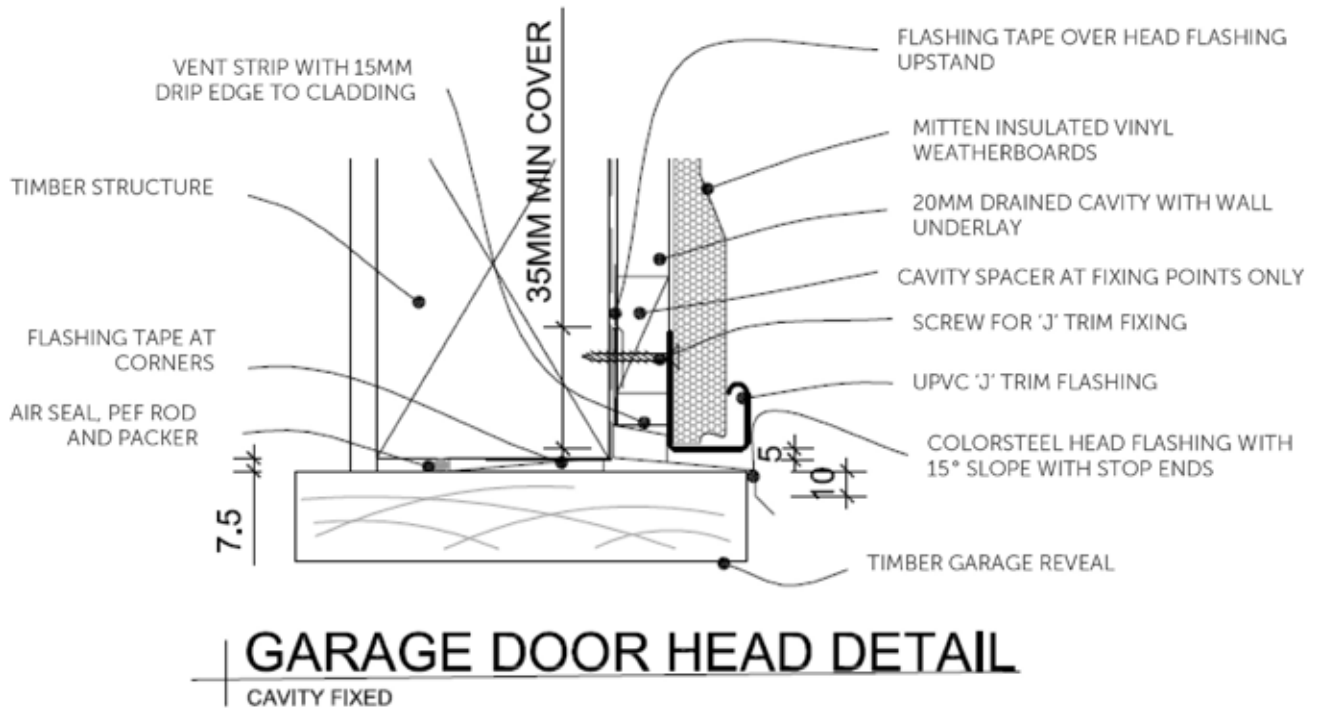


FIGURE 26 - Garage Door Jamb Detail

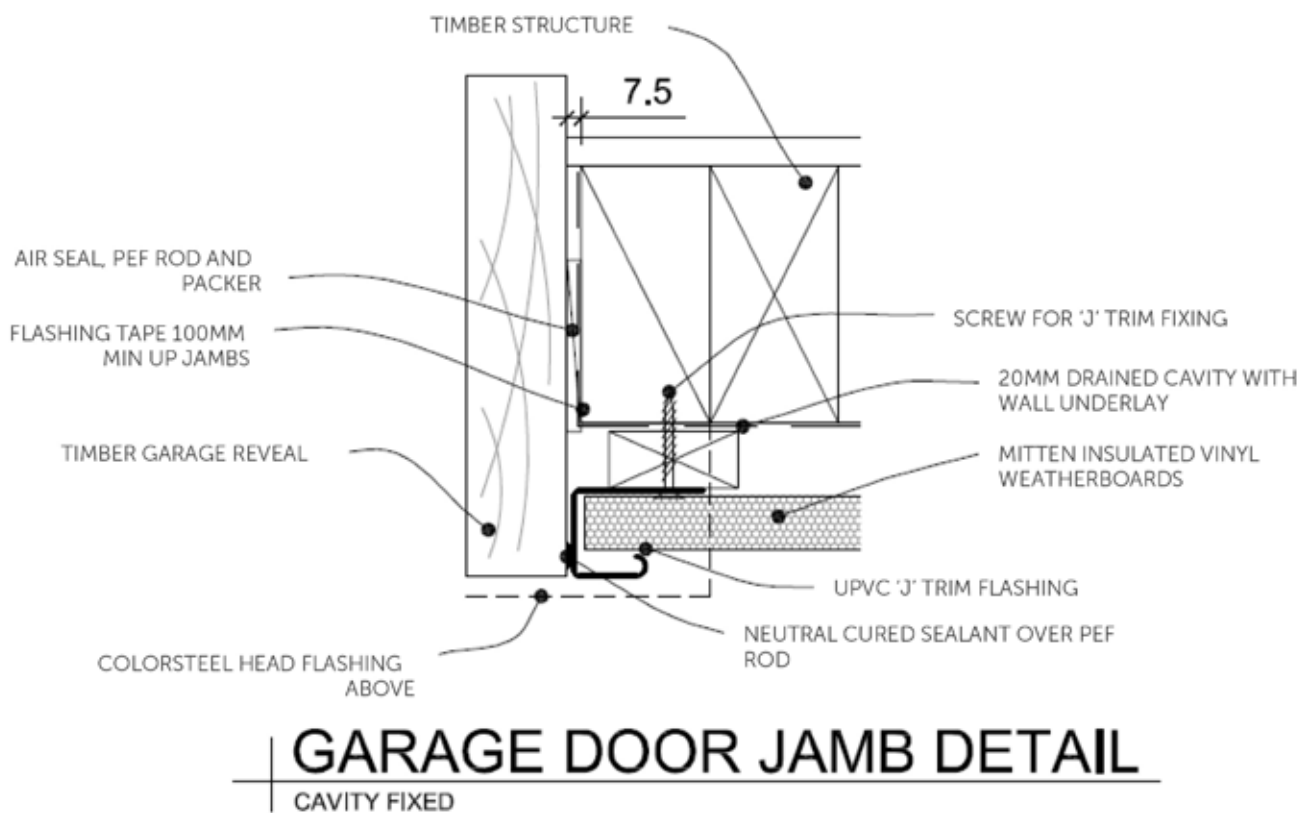
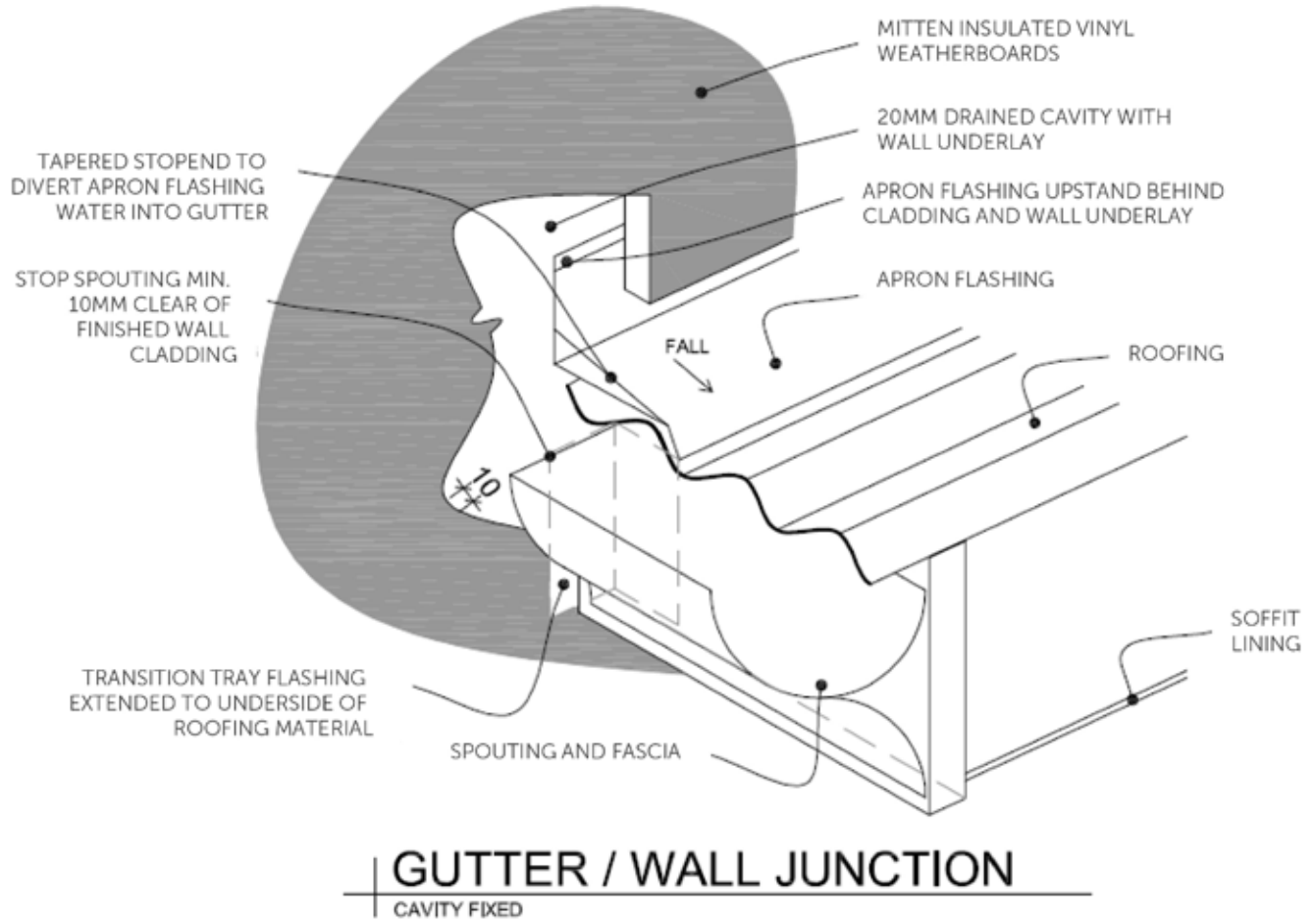


FIGURE 27 - Gutter/Wall Junction



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Additional CAD details are available from Vinyl Cladding New Zealand Ltd, New Zealand suppliers of Mitten Vinyl – if there is a detail you require which is not featured here please contact us on:

info@vinylcladding.co.nz | 0800 Mitten

FIGURE 1 - Elevation of Weatherboard

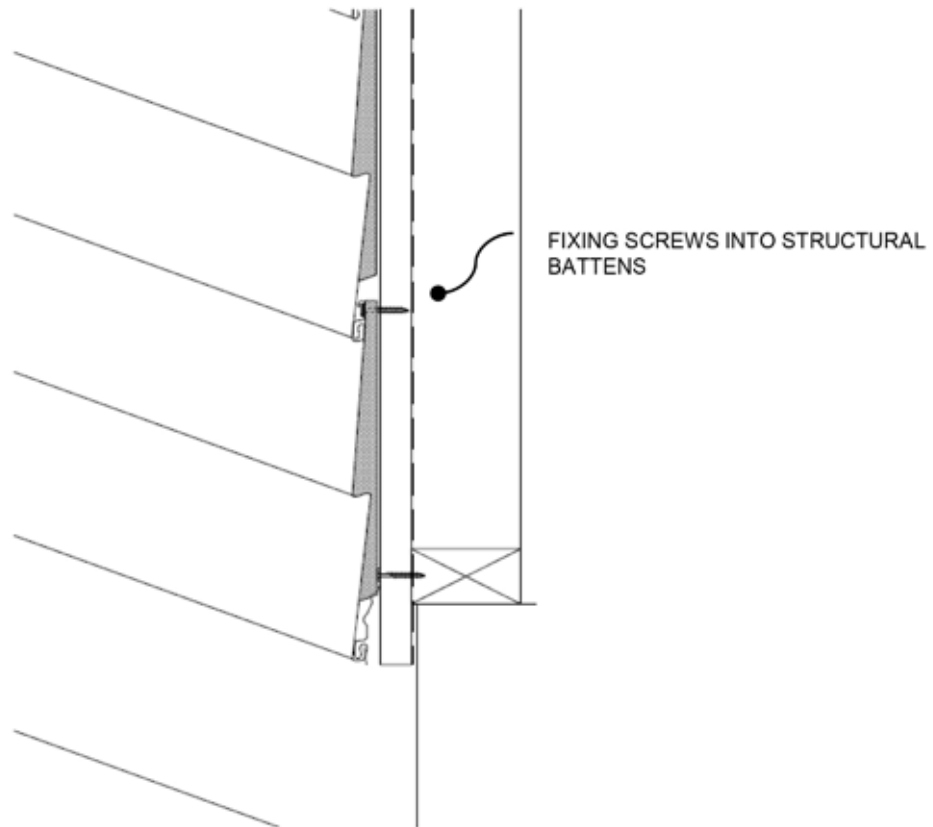
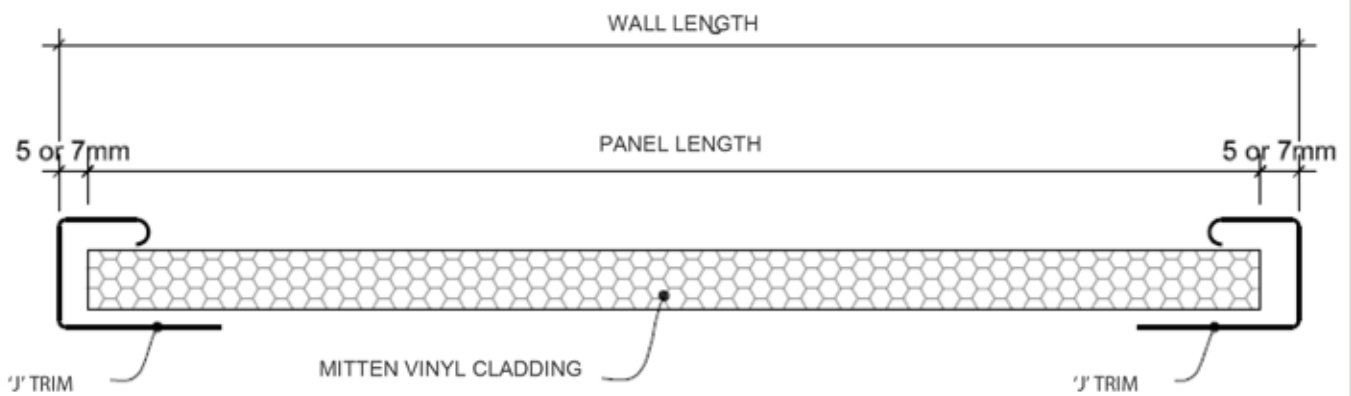


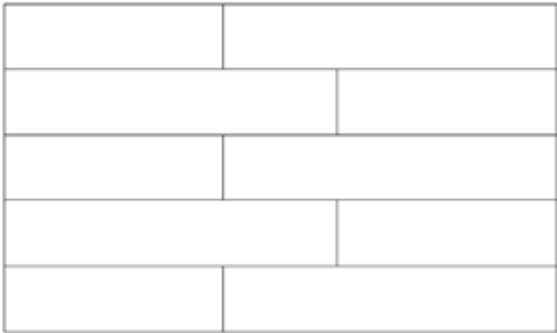
FIGURE 2 - Plan view of installed Weatherboard between two J-Trims



NOTE:

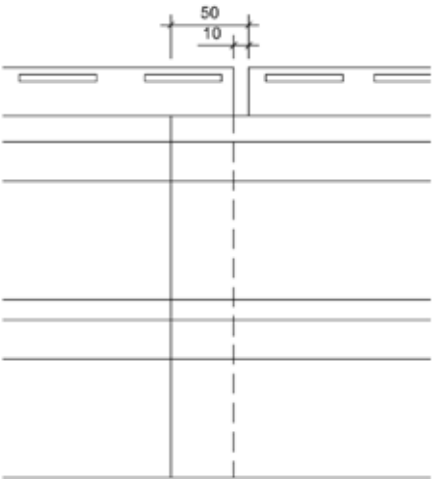
- 5MM CLEARANCE IN TEMPERATURES OVER 20° CELCIUS
- 7MM CLEARANCE IN TEMPERATURES UNDER 20° CELCIUS

FIGURE 3 - Joining Sequence of weatherboards



JOINING SEQUENCE

FIGURE 4 - Weatherboard jointing lap



VERTICAL PANEL JOIN

FIGURE 5 - Cross-section of Weatherboard

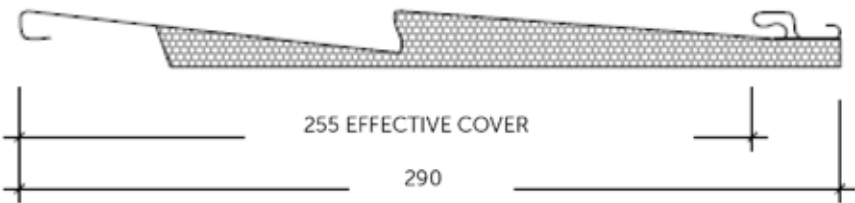


FIGURE 6 - Cavity Fixed Base Detail

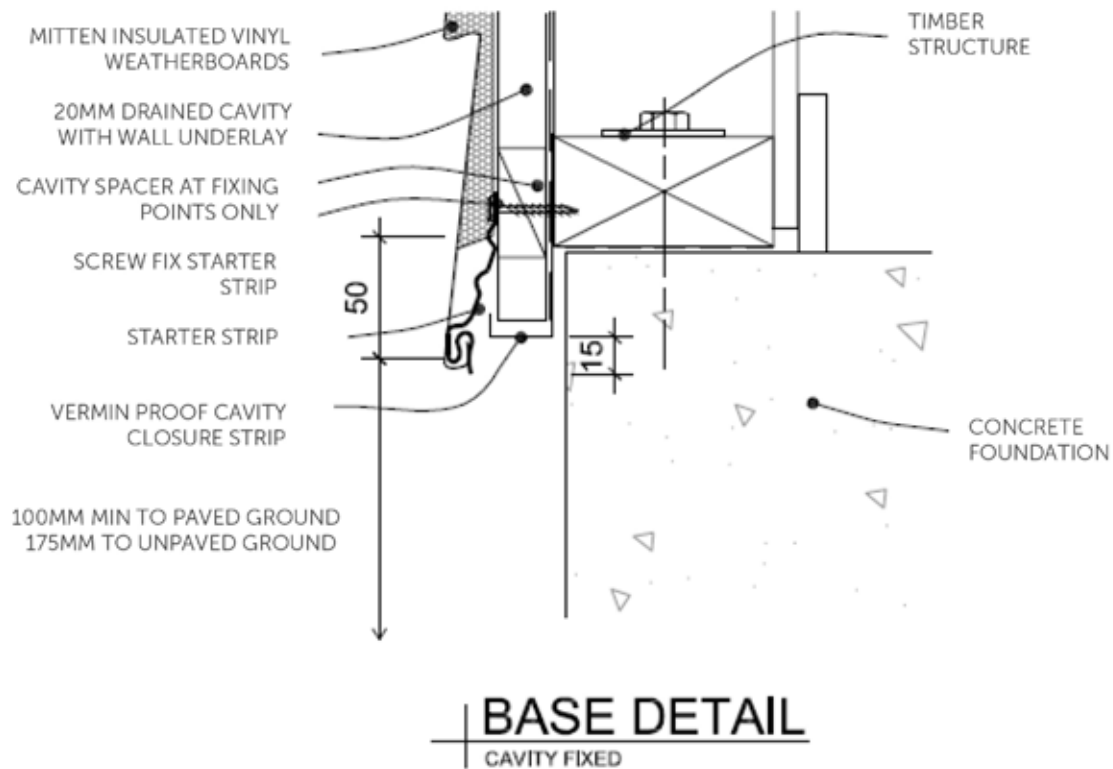


FIGURE 7 - Cavity Fixed External Corner Detail

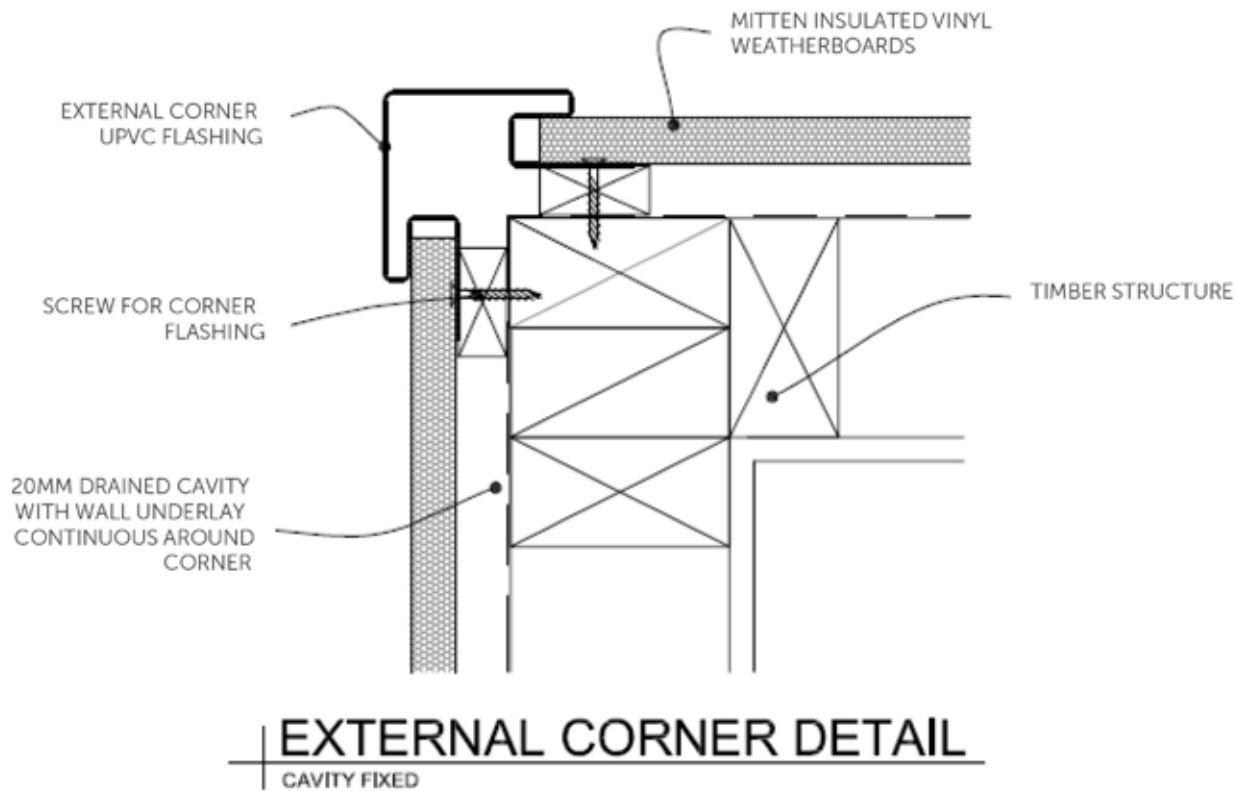
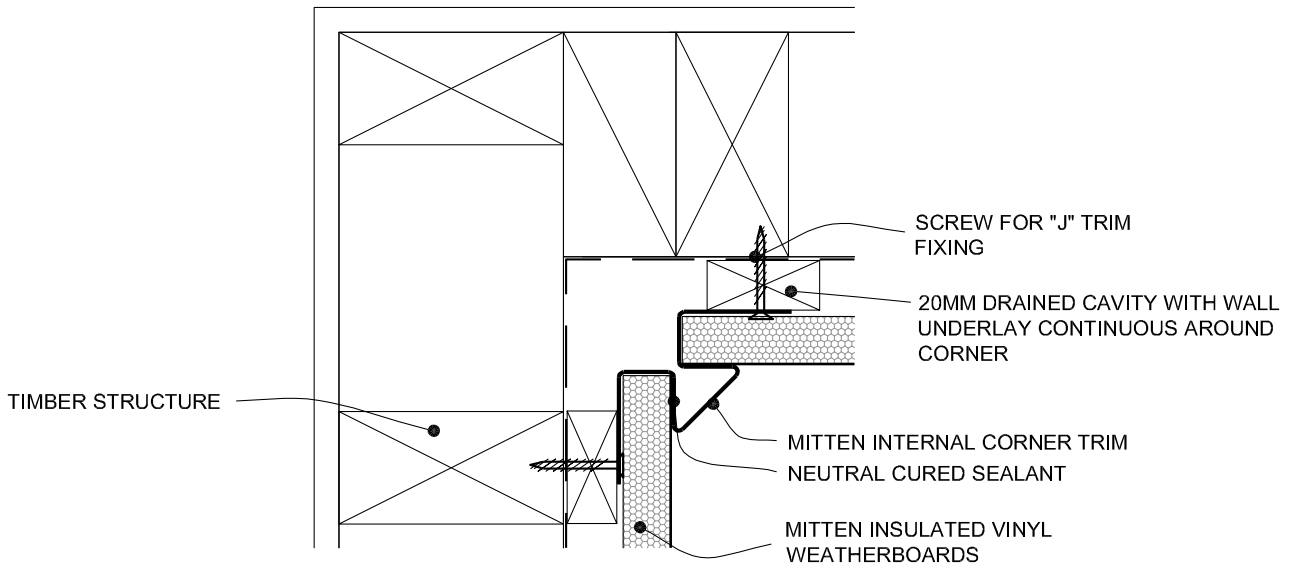


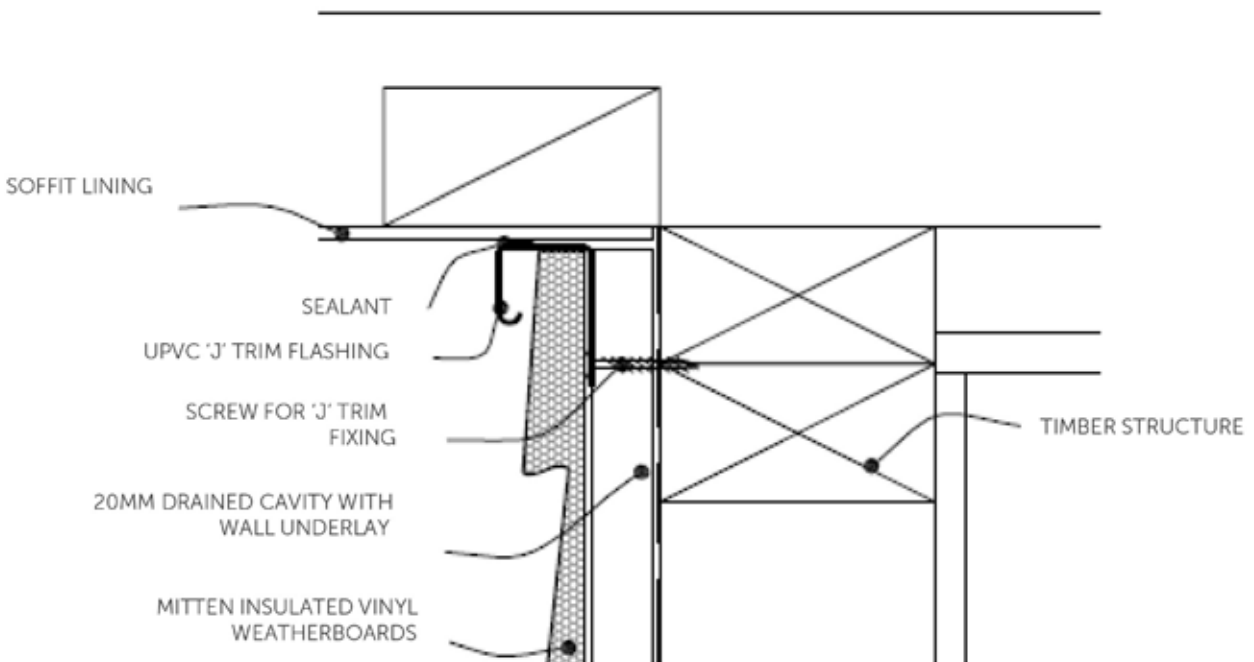
FIGURE 8 - Cavity Fixed Internal Corner Detail



INTERNAL CORNER DETAIL

CAVITY FIXED

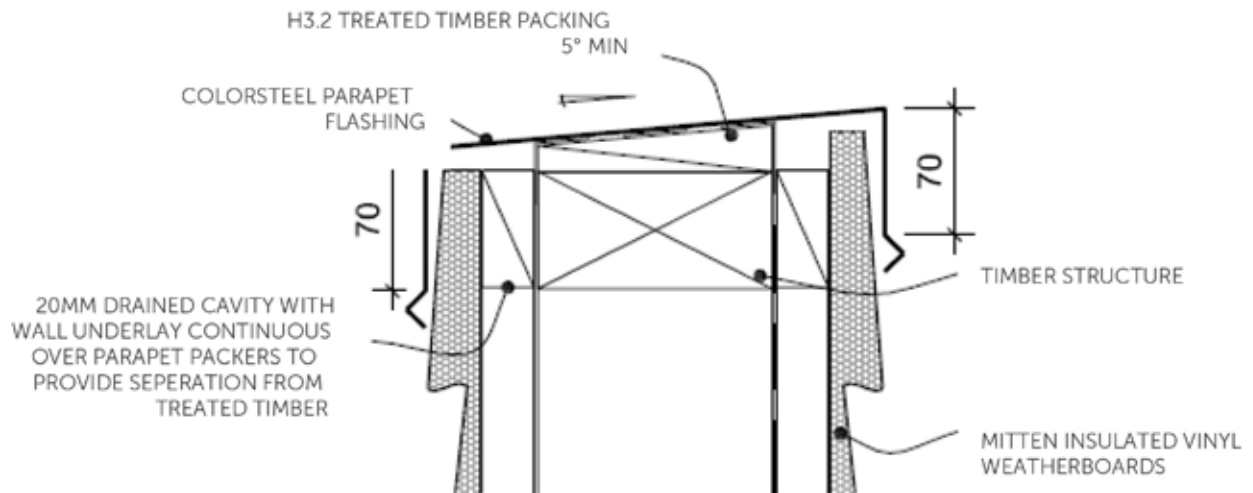
FIGURE 9 - Cavity Fixed Soffit Detail



SOFFIT DETAIL

CAVITY FIXED

FIGURE 10 - Cavity Fixed Parapet Detail

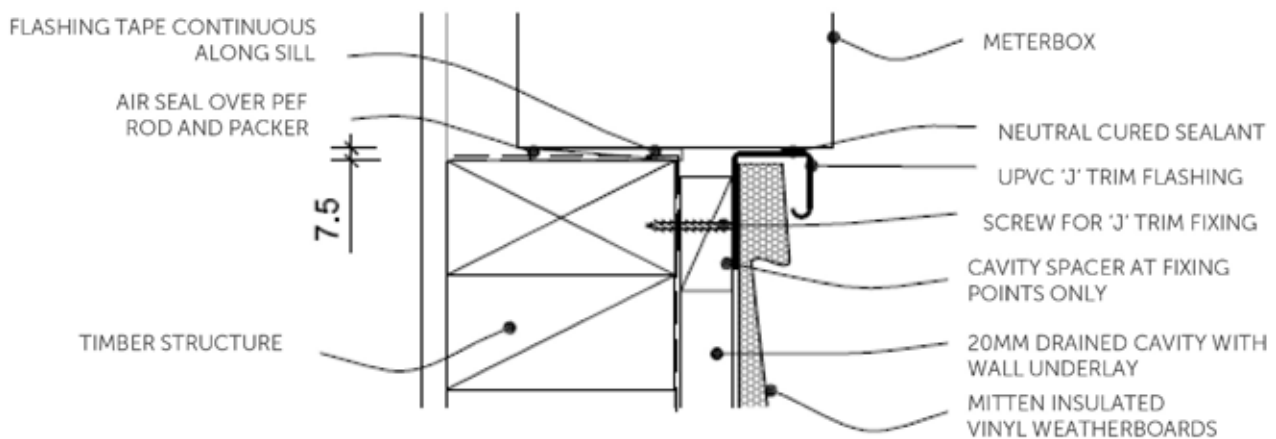


PARAPET DETAIL

CAVITY FIXED

NOTE: Refer to E2/AS1 Table 7 for minimum flashing cover dimensions

FIGURE 11 - Cavity Fixed Meterbox Sill Detail



METERBOX SILL DETAIL

CAVITY FIXED

FIGURE 12 - Cavity Fixed Meterbox Jamb Detail

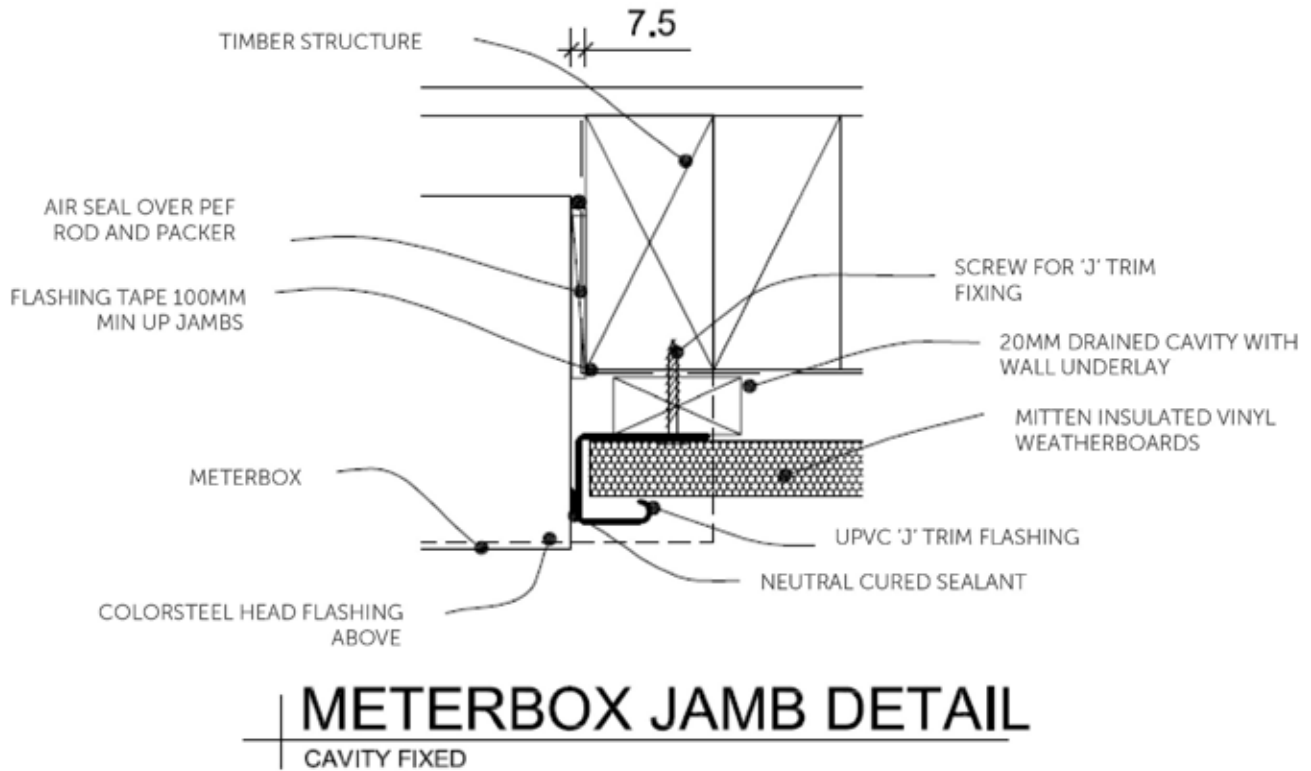


FIGURE 13 - Cavity Fixed Meterbox Head Detail

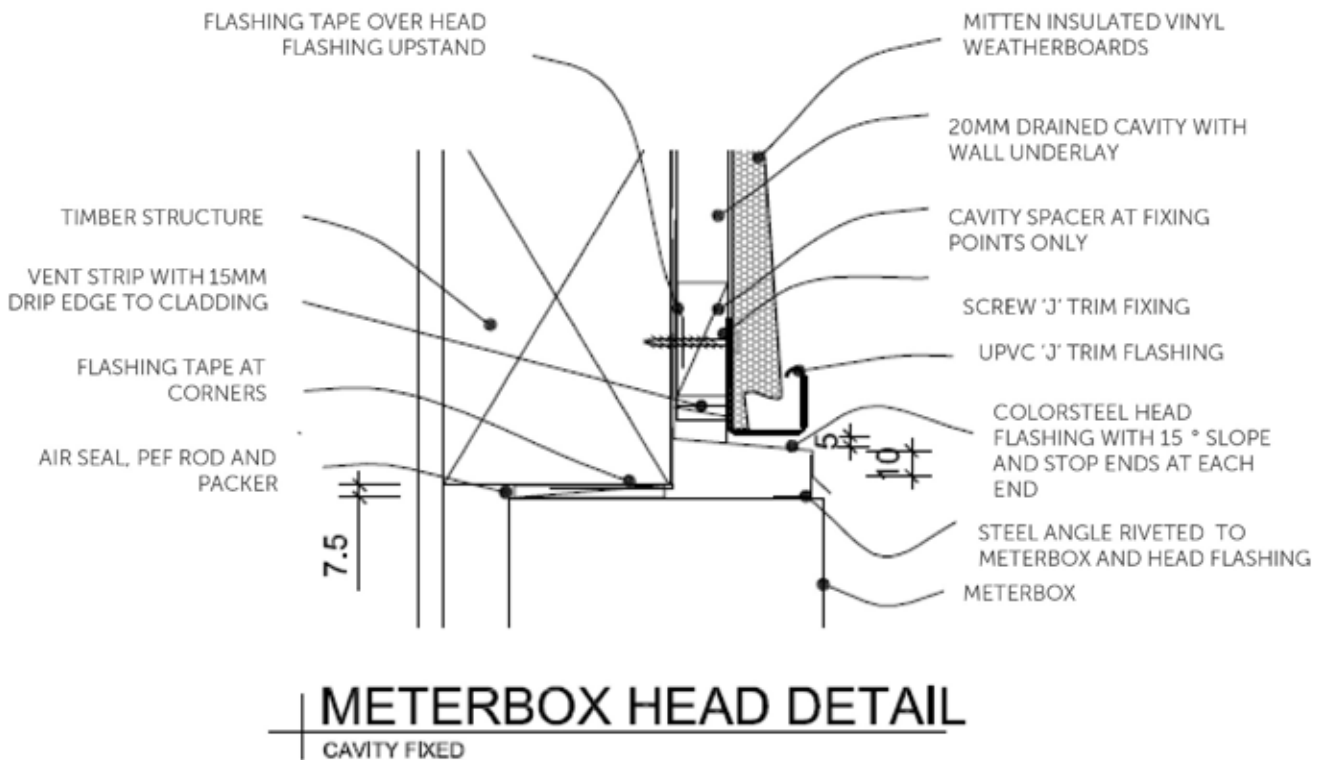


FIGURE 14 - Cavity Fixed Joinery Head Detail

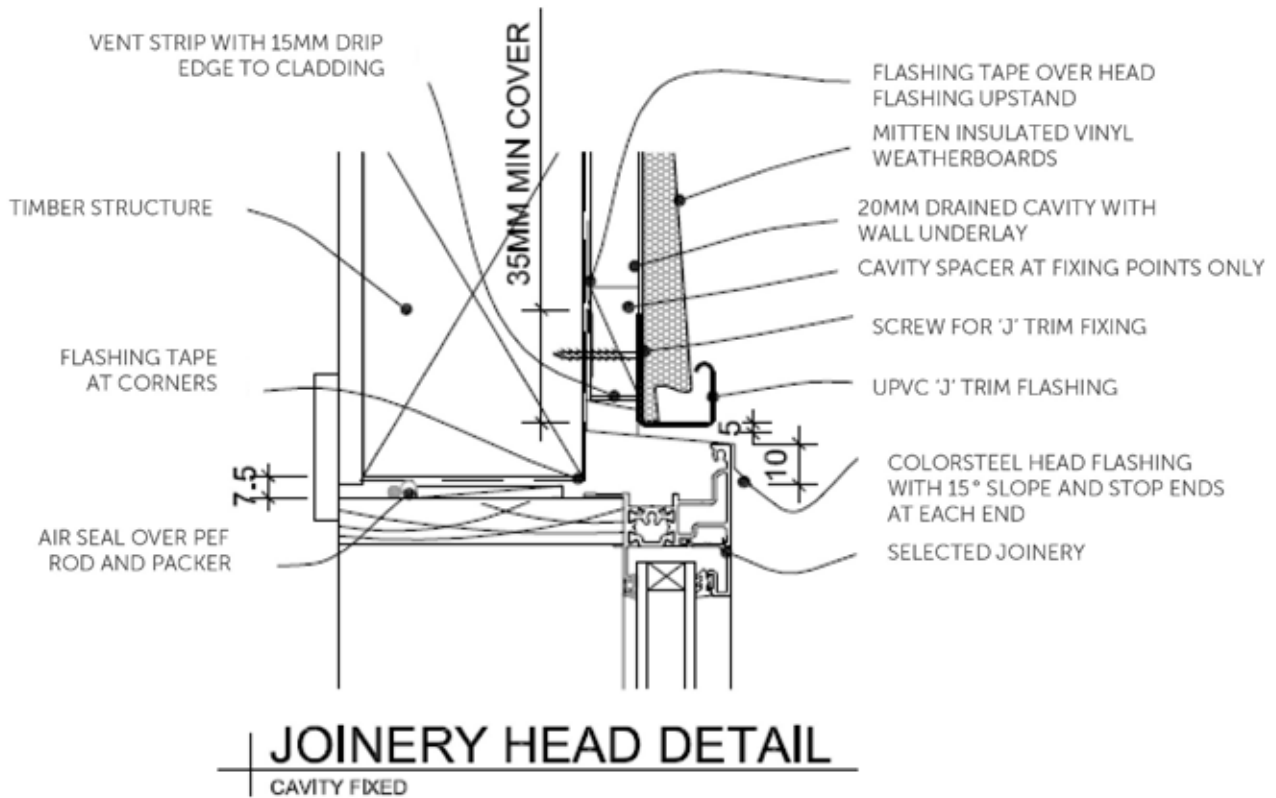


FIGURE 15 - Cavity Fixed Joinery Jamb Detail

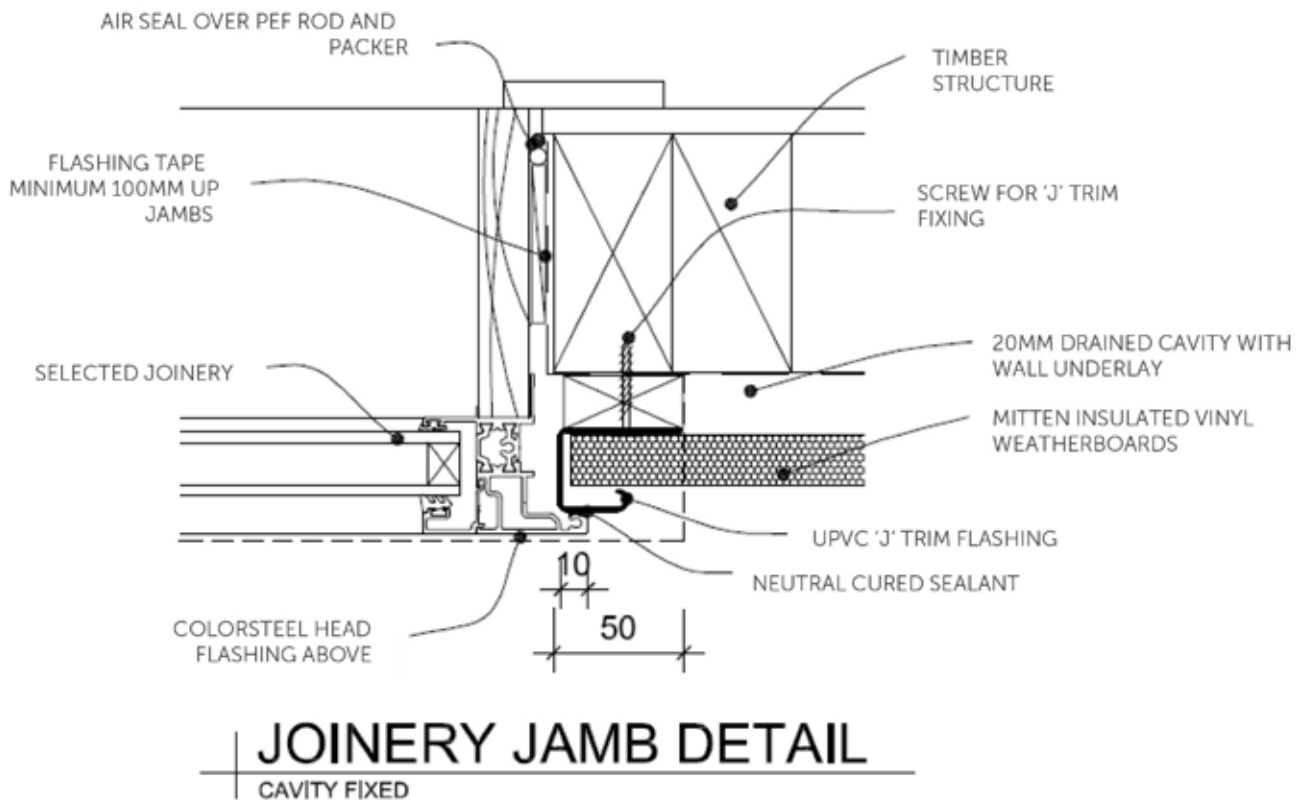


FIGURE 16 - Cavity Fixed Joinery Sill Detail

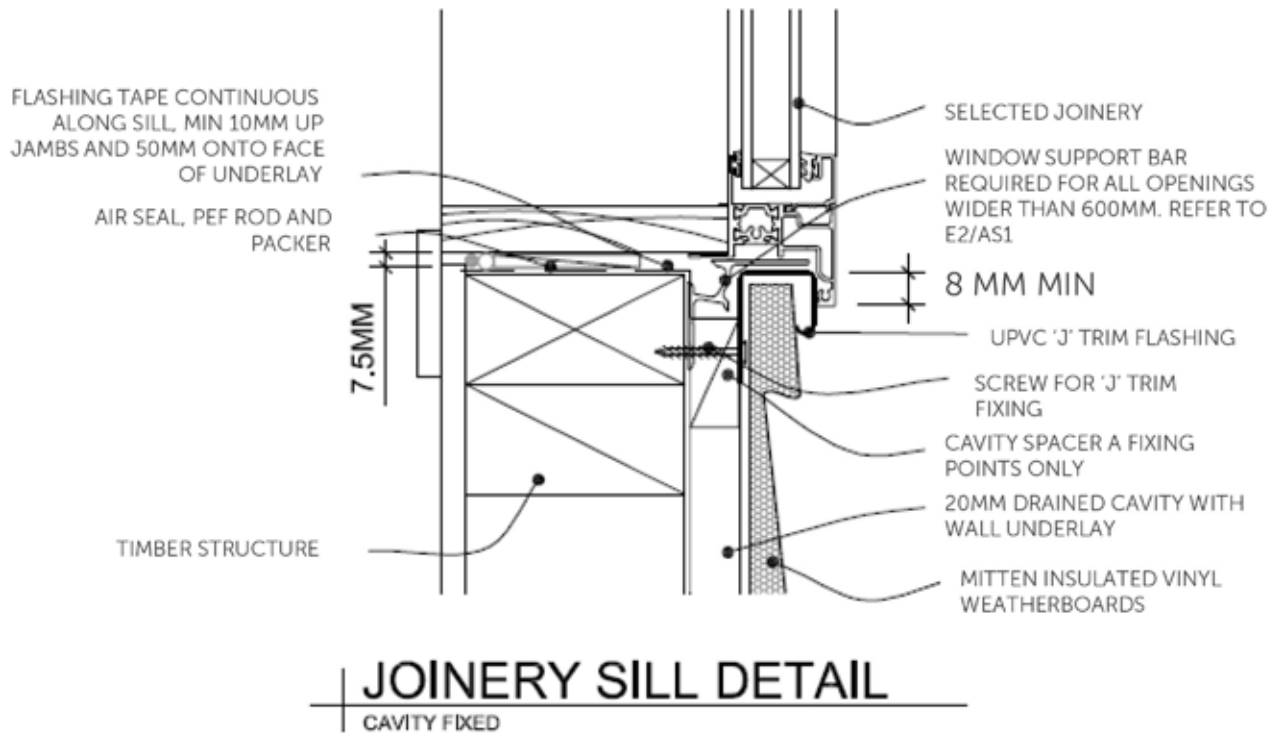


FIGURE 17 - Pipe Penetration

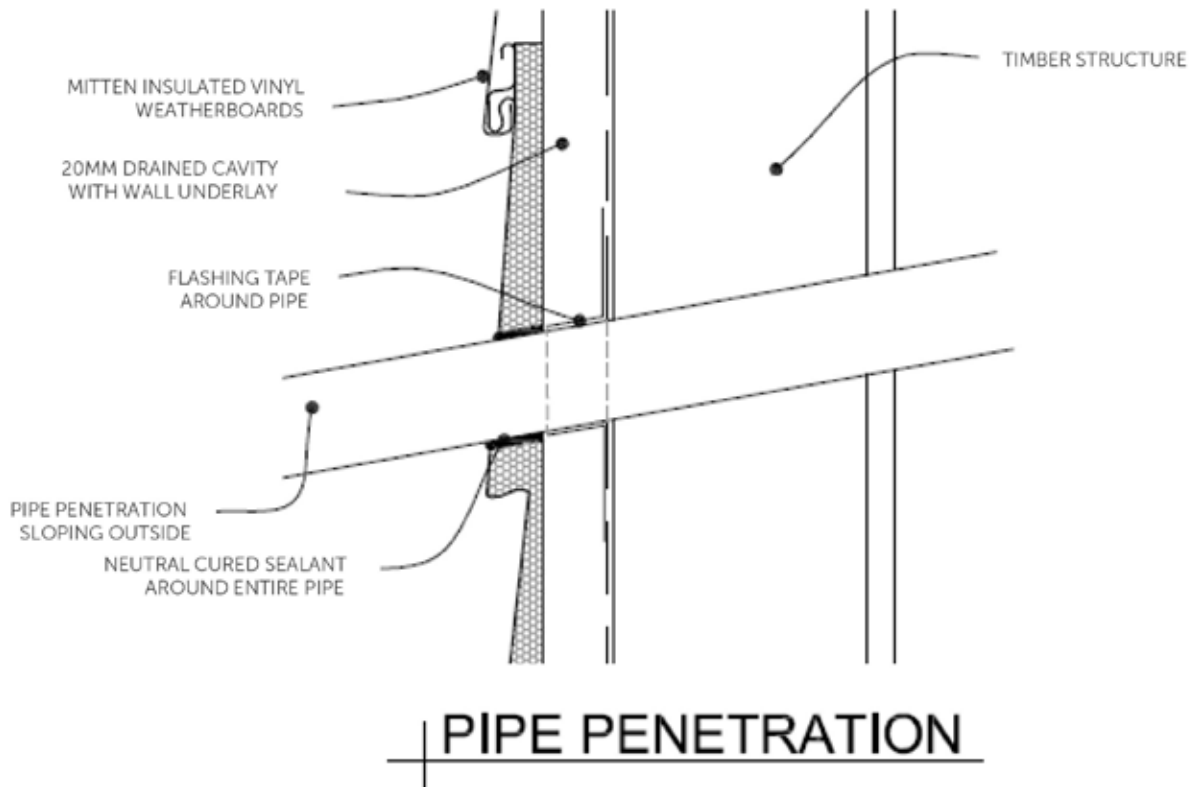


FIGURE 18 - Cavity Fixed Brick Veneer Junction Detail

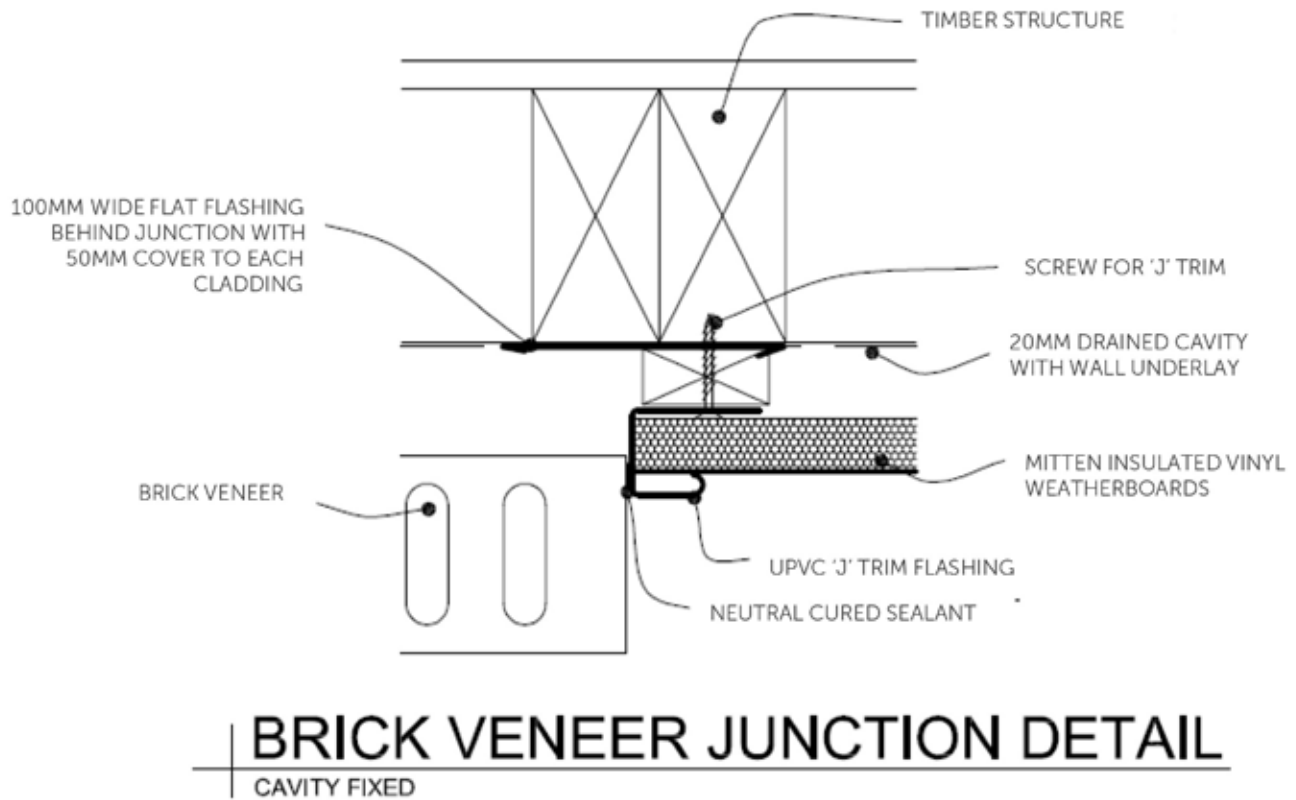


FIGURE 19 - Cavity Fixed Vertical Profiled Metal Junction Detail

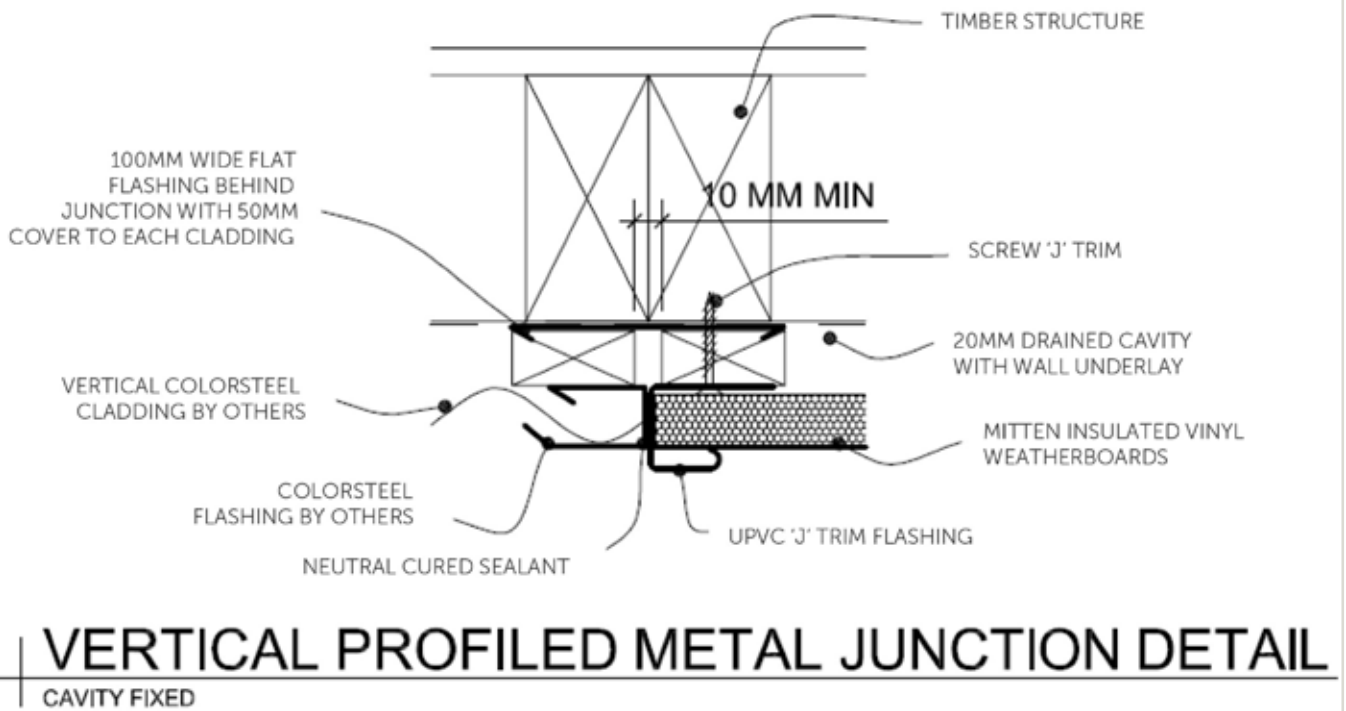
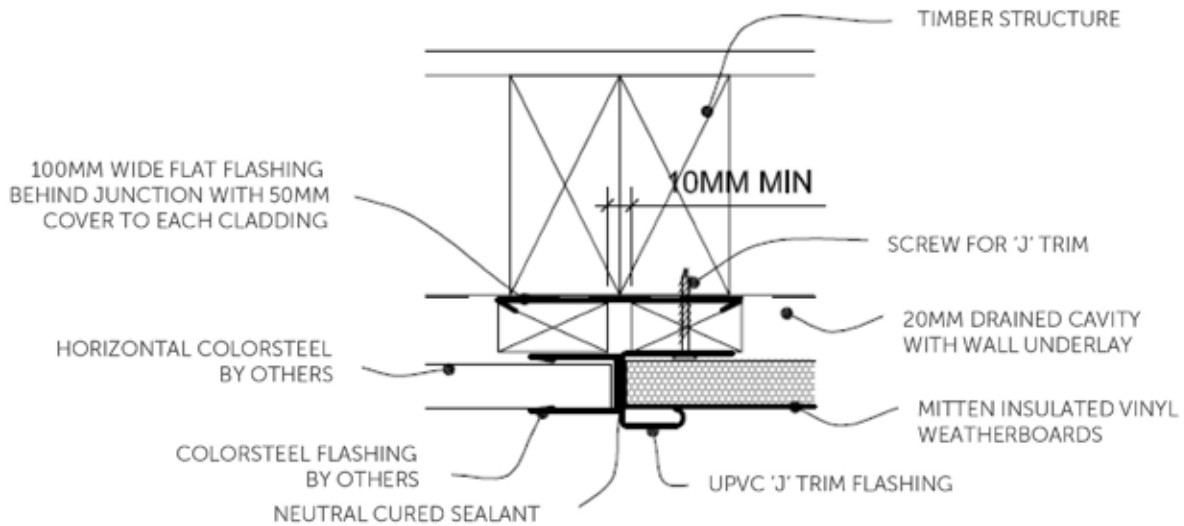


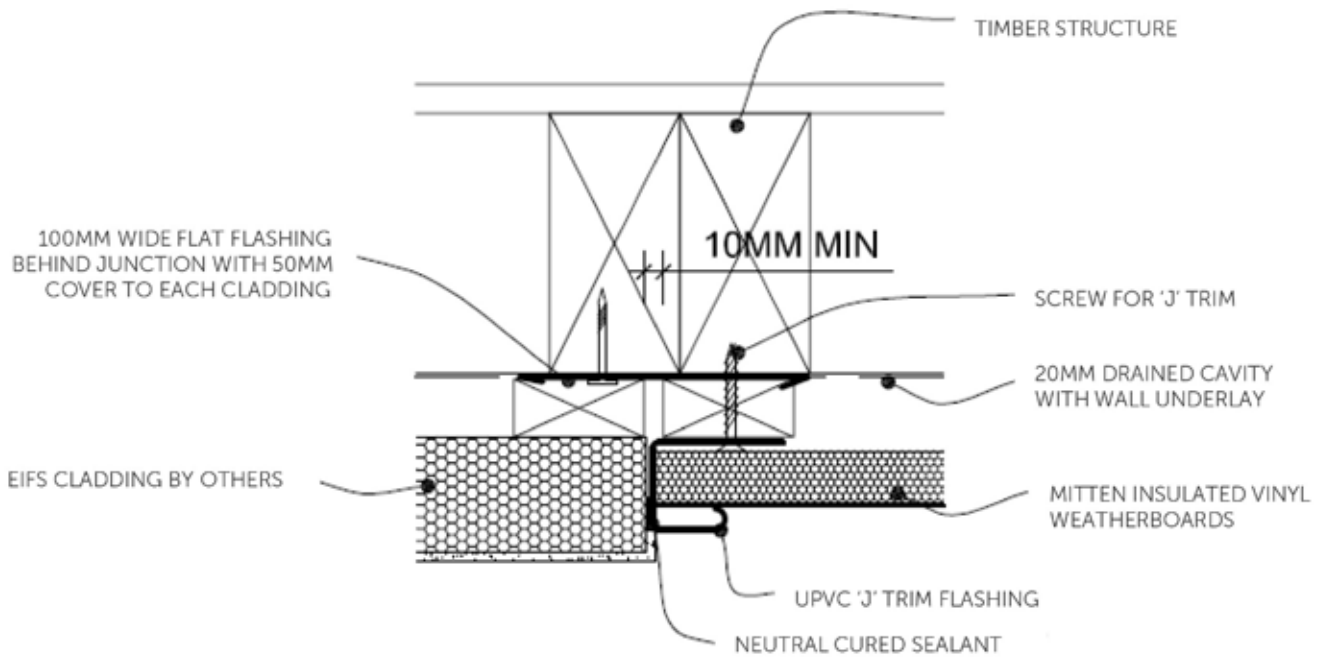
FIGURE 20 - Cavity Fixed Horizontal Iron Junction Detail



HORIZONTAL PROFILED METAL JUNCTION DETAIL

CAVITY FIXED

FIGURE 21 - Cavity Fixed Eifs Junction Detail



EIFS JUNCTION DETAIL

CAVITY FIXED

FIGURE 22 - Cyclone Washer

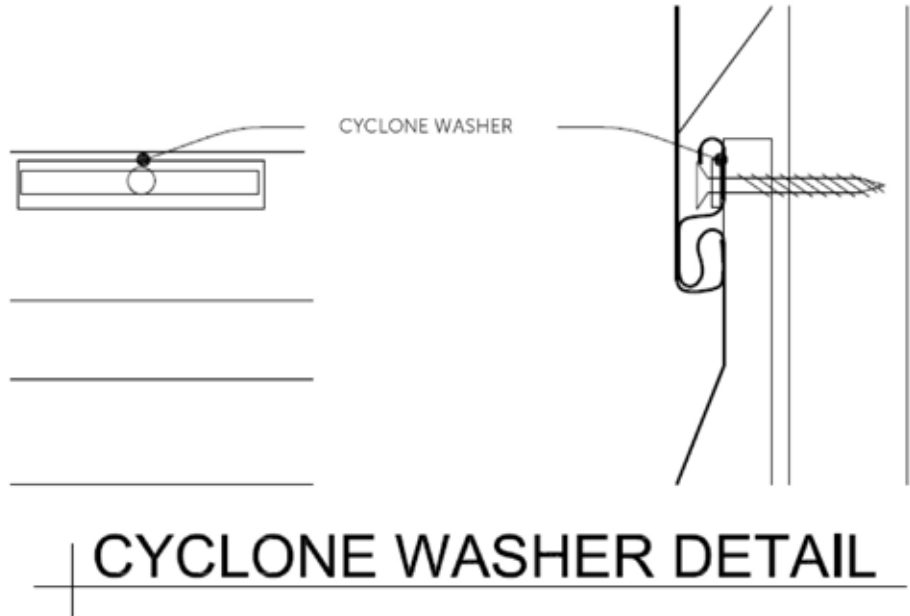


FIGURE 23 - Roof to Wall Junction Parallel

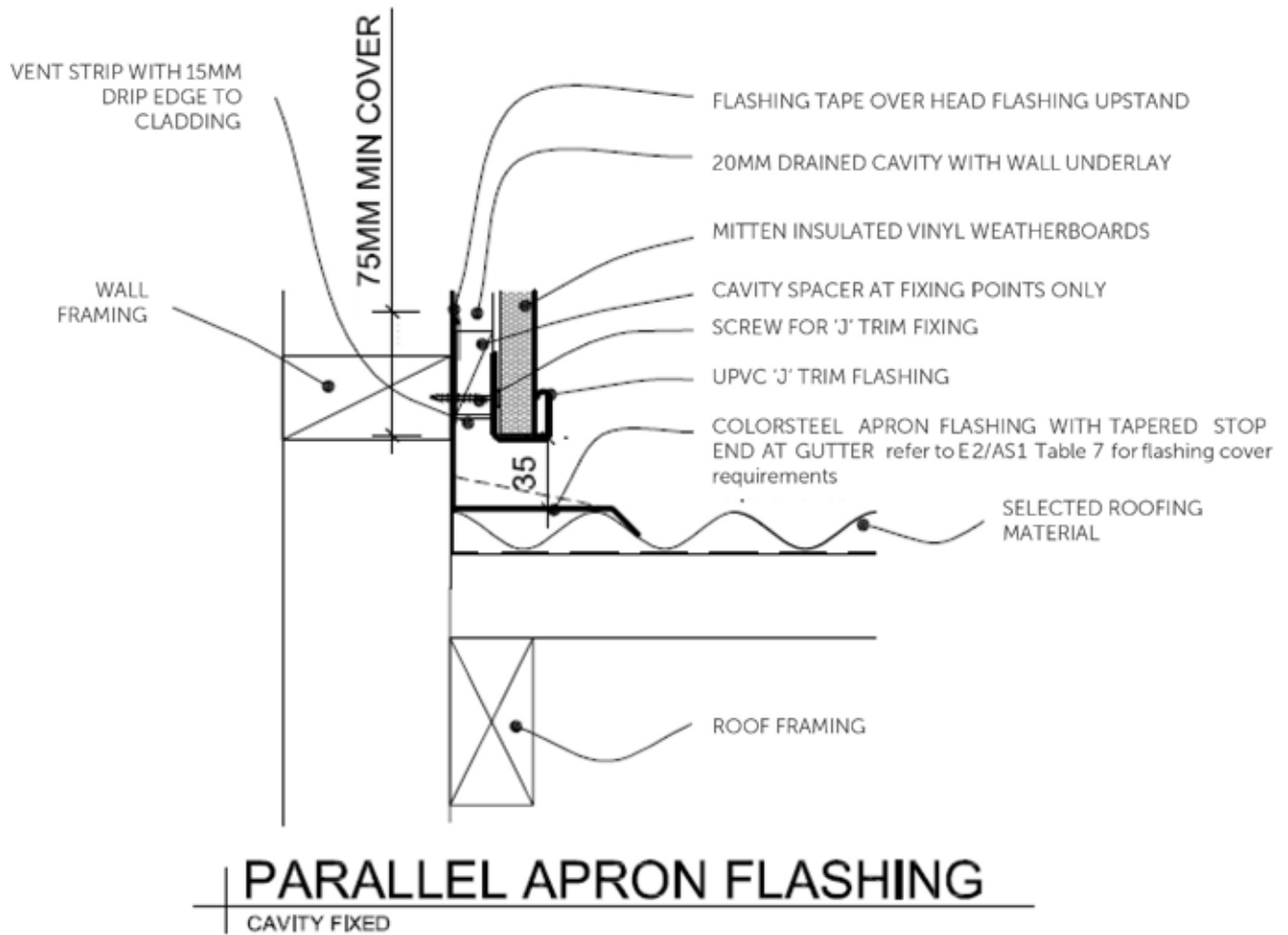


FIGURE 24 - Roof to Wall Junction Perpendicular

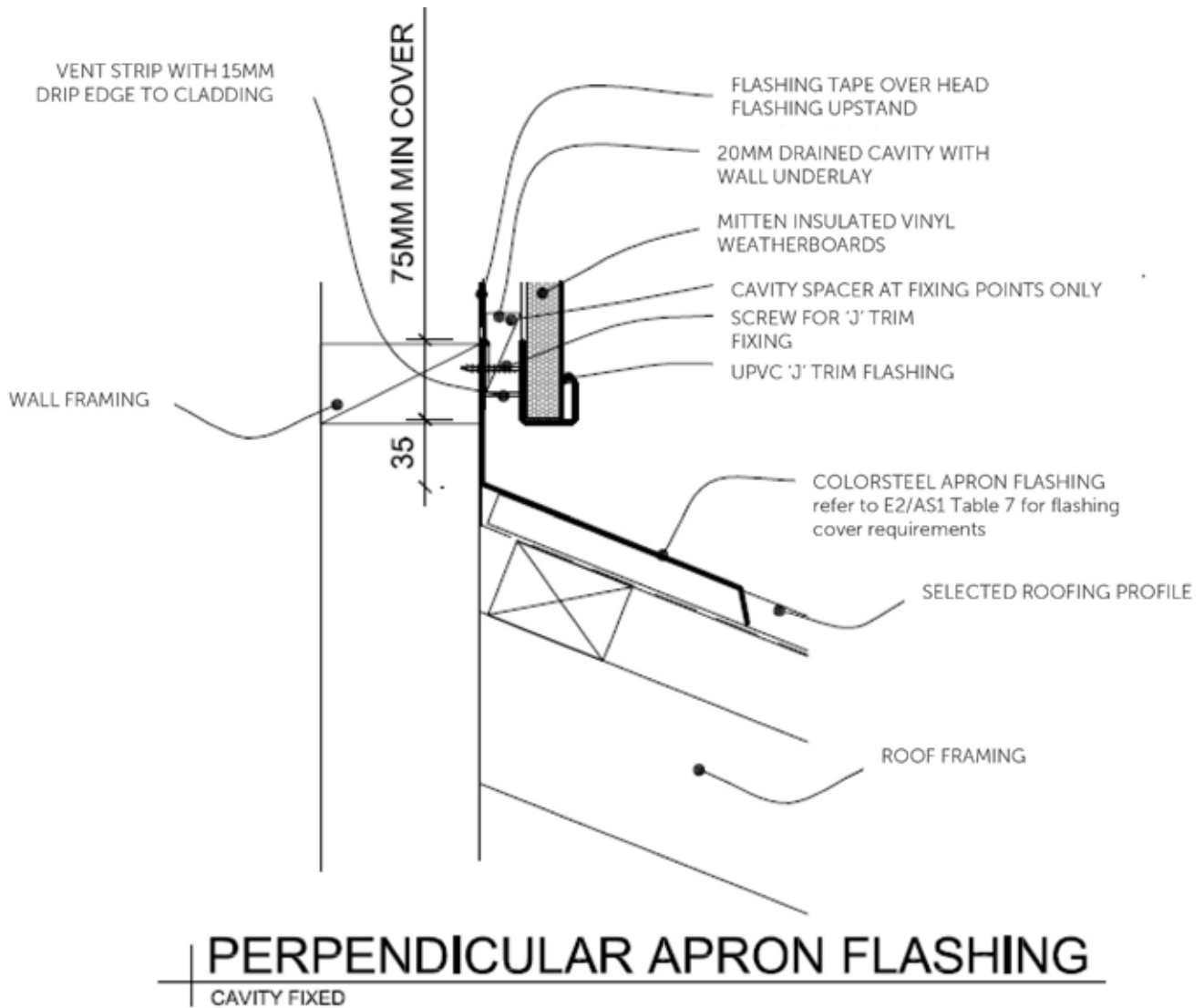


FIGURE 25 - Garage Door Head Detail

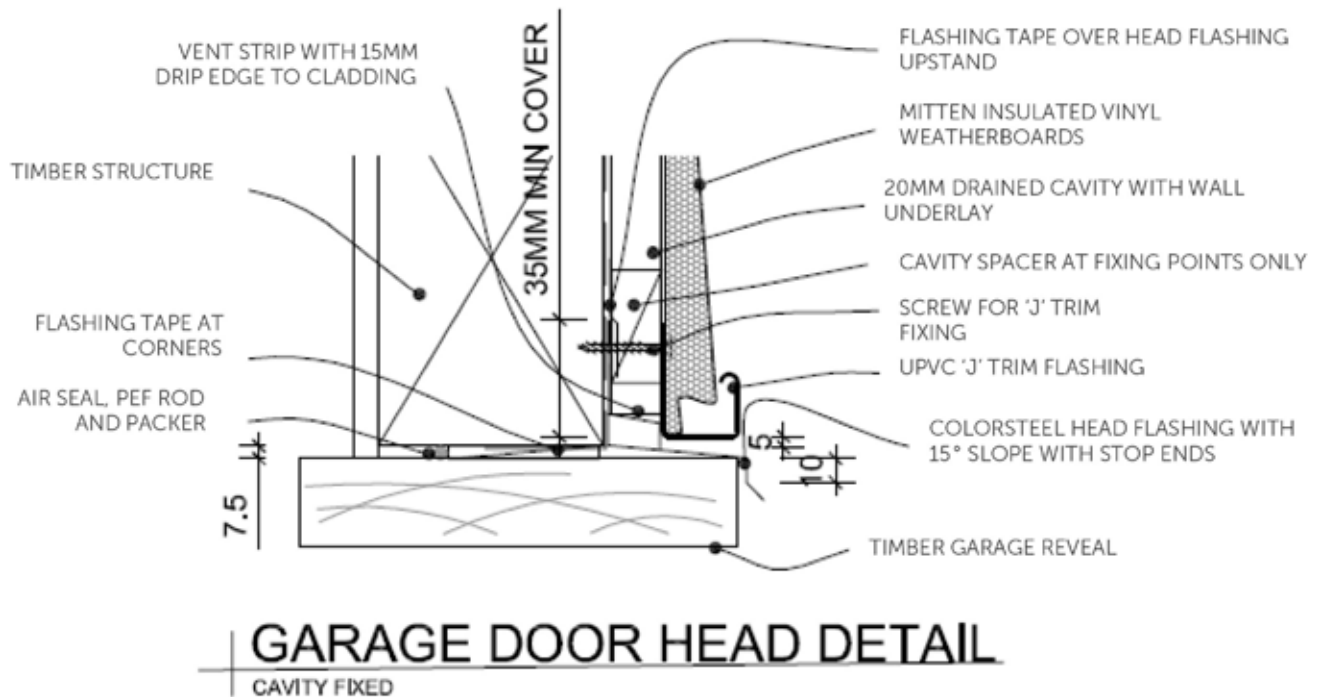


FIGURE 26 - Garage Door Jamb Detail

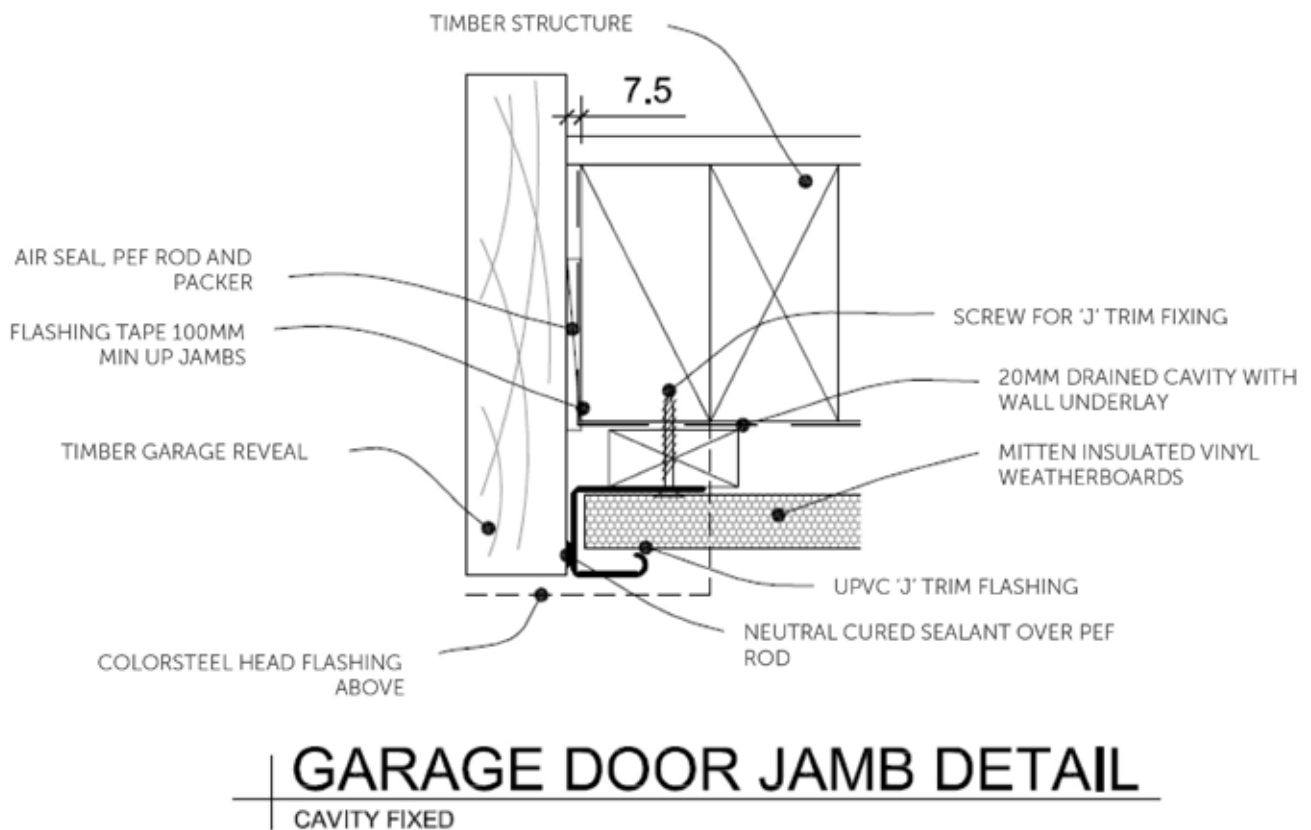
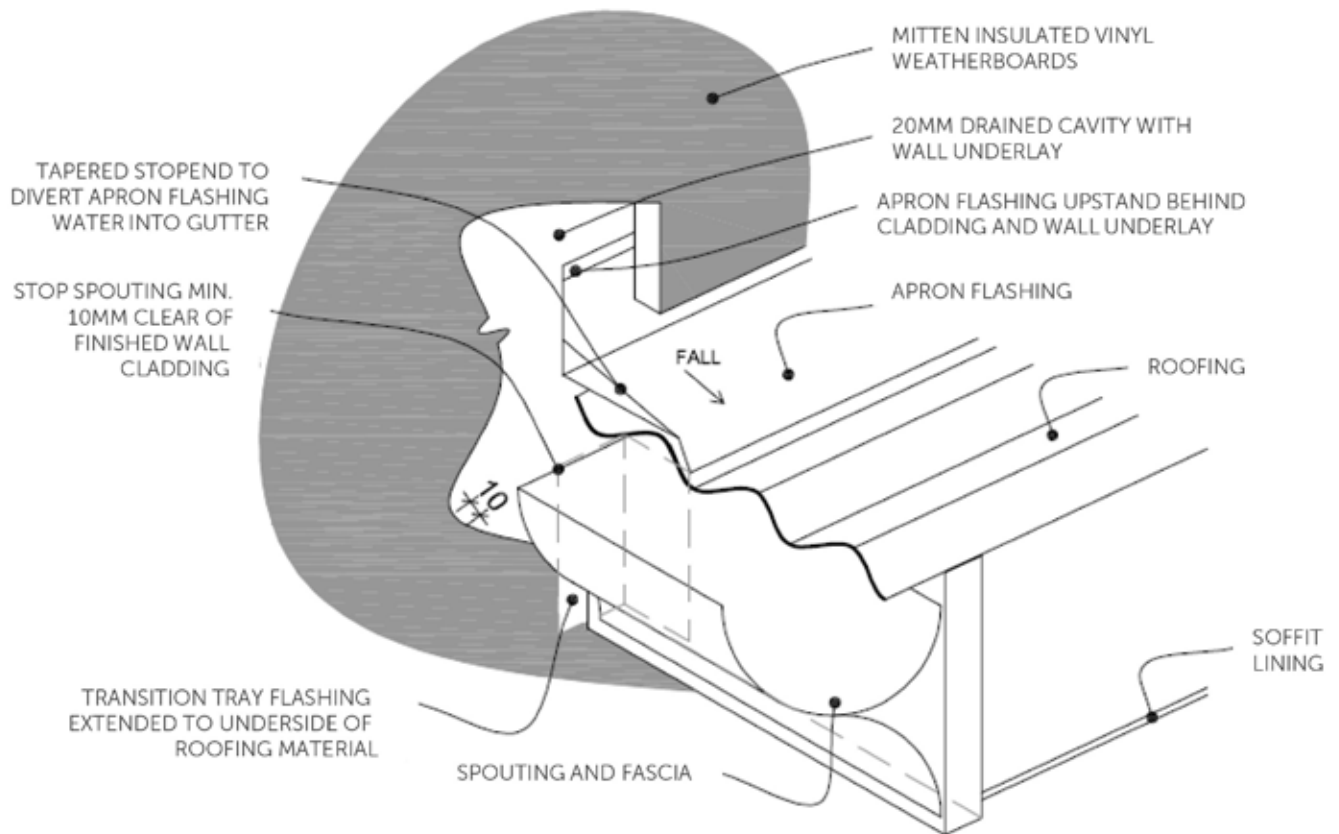


FIGURE 27 - Gutter/Wall Junction



GUTTER / WALL JUNCTION

CAVITY FIXED

OPTIONAL ACCEPTABLE INSTALL SOLUTION DETAIL MULTI ANGLE - INTERNAL CORNER DETAIL

Note: In some instances of installation, single piece "W" internal corners are not available to either suit all profiles, colours, aesthetics and/or insulation thickness or angles. In these cases the use of a back to back J trim is standard interface practice. This is an original installation method since 1959 prior to the introduction one piece "W" internal corners in 2014.

You will note that in this method, a soaker flashing (as annotated in corrosion resistant steel) is applied behind, the vertical J trims as a secondary barrier. It is considered this flashing can be substituted to be an impermeable tape soaker flashing if required.

Figure 19a (C) - Supplementary Option - Back to Back J trim - Internal Corner over Cavity

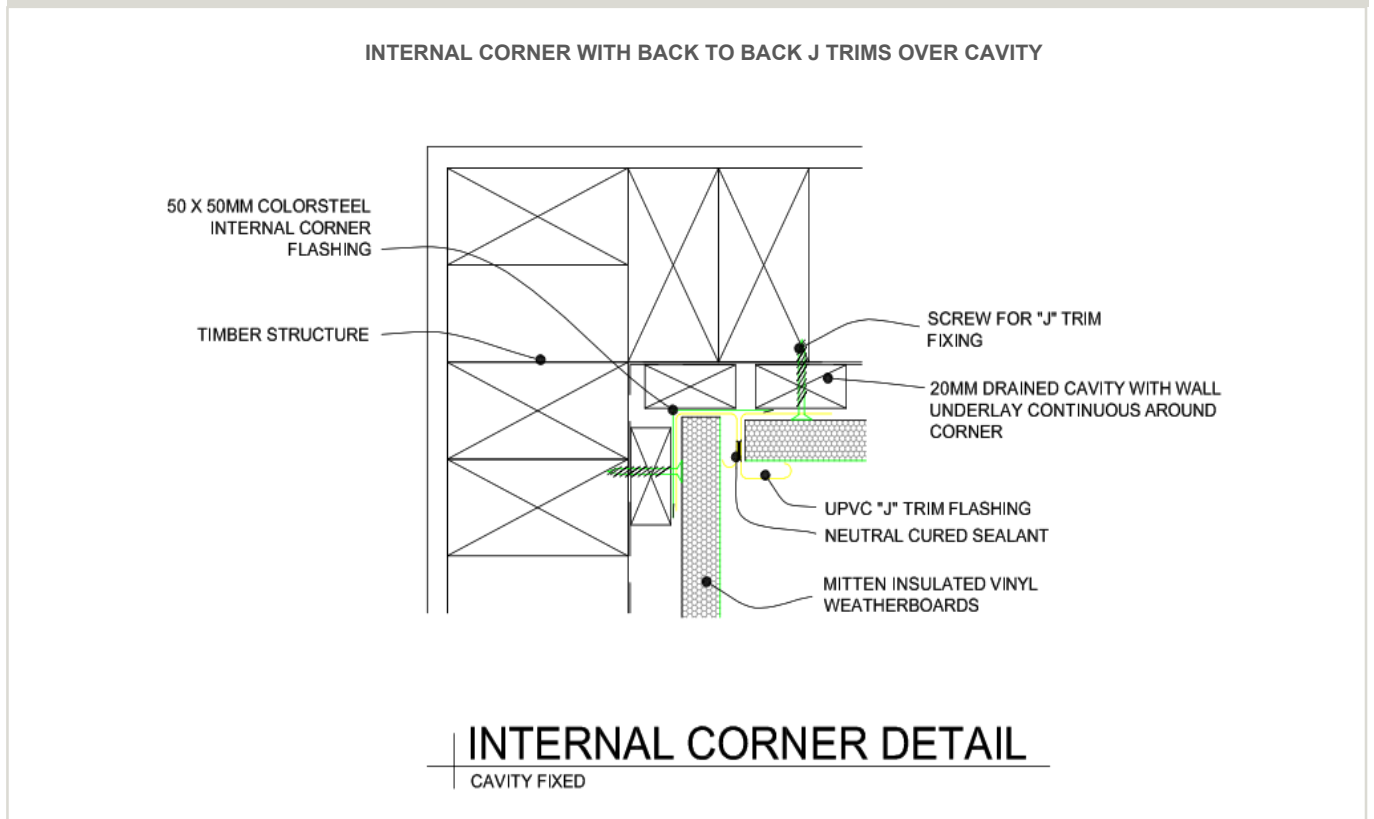
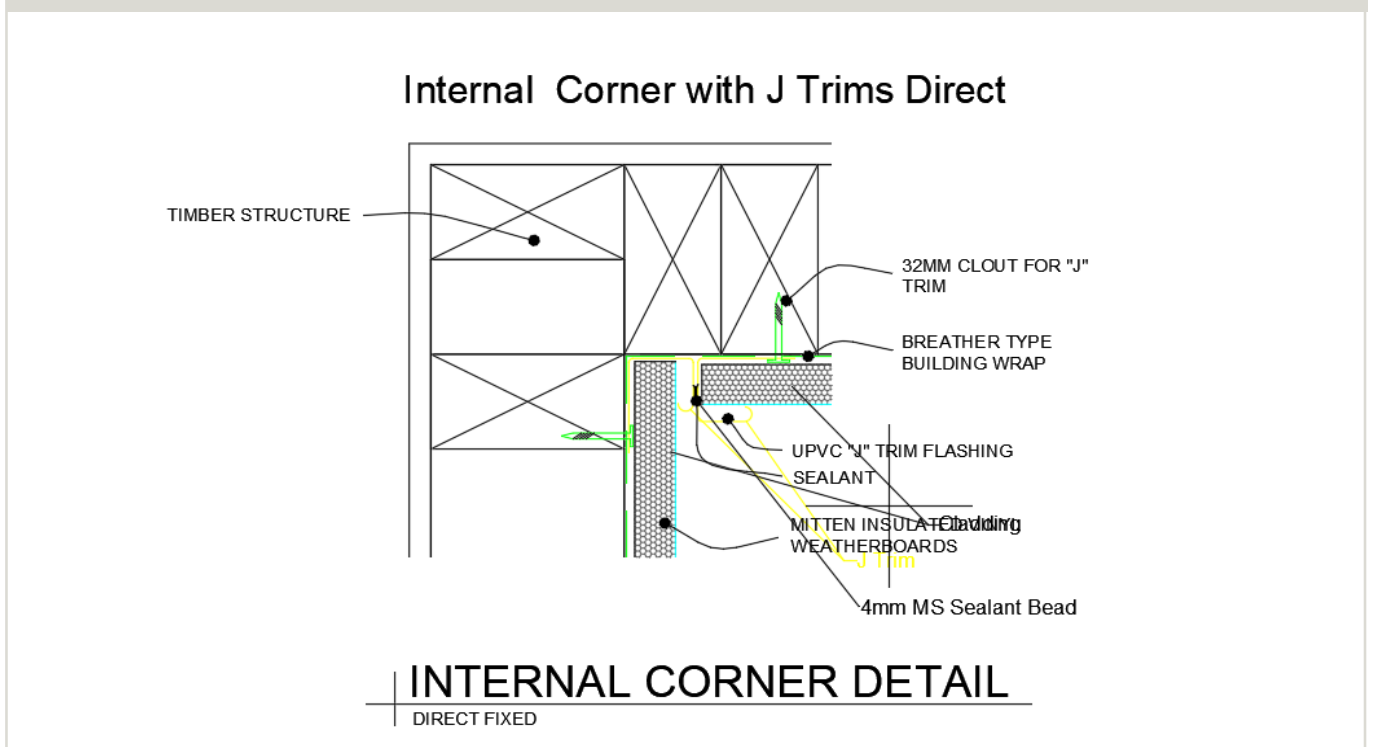


Figure 19a (D) - Supplementary Option - Back to Back J trim - Internal Corner Direct Fixed





BRANZ Appraised
Appraisal No. 814 (2013)

BRANZ Appraisals
Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 814 (2013)**

**MITTEN CAMBRIDGE
AND CEDARLINE VINYL
CLADDINGS**

Amended 22 December 2014

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Product

- 1.1 Mitten Cambridge and Cedarline Vinyl Claddings are cavity-based external wall claddings for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The cladding systems consist of colour finished vinyl (PVC) weatherboards with an extruded polystyrene backing, vinyl finishing profiles, flashings and accessories. The weatherboards are installed horizontally with concealed fixings over timber structural battens.
- 1.3 The claddings incorporate a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the claddings from the external wall frame with a nominal 20 mm drained cavity.



Scope

- 2.1 Mitten Cambridge and Cedarline Vinyl Claddings have been appraised as external horizontally fixed wall claddings for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC; 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 Mitten Cambridge and Cedarline Vinyl Claddings have also been appraised as external horizontally fixed wall claddings for specifically designed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; 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 2.5 kPa.
- 2.3 Mitten Cambridge and Cedarline Vinyl Claddings are appraised for use with aluminium window and door joinery that is installed with vertical joints and horizontal heads and sills. (The Appraisal of Mitten Cambridge and Cedarline Vinyl Claddings relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)
- 2.4 Mitten Cambridge and Cedarline Vinyl Claddings must be installed by trained installers licensed by Mitten Vinyl Australia.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Mitten Cambridge and Cedarline Vinyl Claddings, 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. Mitten Cambridge and Cedarline Vinyl Claddings meet the requirement for loads arising from self-weight, wind, impact and creep (i.e. B1.3.3 (a), (b), (c) and (d)). See Paragraphs 9.1 to 9.3.

Clause B2 DURABILITY: Performance B2.3.1(b), 15 years and B2.3.2. Mitten Cambridge and Cedarline Vinyl Claddings meet these requirements. See Paragraphs 10.1 to 10.5.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Mitten Cambridge and Cedarline Vinyl Claddings meet this requirement. See Paragraphs 15.1 to 15.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mitten Cambridge and Cedarline Vinyl Claddings meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an Alternative Solution in terms of New Zealand Building Code compliance.

Technical Specification

4.1 Components and accessories supplied by Mitten Vinyl Australia are as follows:

Mitten Vinyl Cladding Weatherboards

- Mitten Cambridge and Cedarline Weatherboards are manufactured from extruded PVC and are formed into a profile that allows the boards to lock with each other. On the back face of the weatherboards is an expanded polystyrene (EPS) foam backing that adds rigidity and impact resistance once installed. The weatherboards including the EPS backing are 21 mm thick and supplied in 5.8 m lengths.
 - Cambridge weatherboards are produced to replicate a pair of conventional rusticated weatherboards and are 265 mm wide, giving an effective vertical coverage of 230 mm per weatherboard course.
 - Cedarline weatherboards are produced to replicate a pair of conventional bevel-back weatherboards and are 290 mm wide, giving an effective coverage of 255 mm per weatherboard course.
 - The weatherboards are factory supplied in white (Frost) and a variety of nine other pastel colours as a finished product that does not require any subsequent coating or painting. The ten colours that are covered by the scope of this Appraisal are:
- | | | | | |
|-------|-------------|------------|-------------|-------------|
| Frost | Bone | Ivory | Light Maple | Sandstone |
| Ash | Brownstone* | Satin Grey | Mist Green | Golden Sand |
- * Note: Cedarline is not available in Brownstone colour.

Accessories

- Starter strip is a PVC extruded profile used to secure the bottom of the first course of weatherboards.
- J-Tim is an extruded PVC channel profile used as a general purpose trim and flashing around penetrations.
- Corner Posts are extruded PVC profile for use on external corners.

- Mitten weatherboard fixings – 34 mm long x 4.15 mm diameter screws with coarse thread at 1.7 mm pitch and 10 mm butt-on-head AS 3566 galvanised Class 4 for NZS 3604 Exposure Zones B and C and Grade 304 Stainless Steel for NZS 3604 Exposure Zone D.
- Cyclone Washers – 50 x 12 x 2 mm with a 4.5 mm diameter central hole, hot dip galvanised or stainless steel.
- 4.2 Accessories used with Mitten Cambridge and Cedarline Vinyl Claddings which are supplied by the building contractor are:
- Structural cavity battens – 45 mm wide by maximum 20 mm thick MS9 B Radiata pine treated to Hazard Class H3.1.
- Structural cavity batten fixings – 60 x 2.8 mm flat-head hot-dip galvanised or 60 x 3.15 mm flat-head annular grooved stainless steel hand-driven nails, or 65 x 2.87 mm round-head or D-head, hot-dip galvanised or stainless-steel ring-shanked power-driven nails.
- (Note: Hot-dip galvanising must comply with AS/NZS 4680 and stainless steel fixings must be Grade 316.)
- Flashings – external corner flashing, internal corner flashing, horizontal inter-storey joint flashing, and parapet cap flashings. The flashings are available in galvanised steel, aluminium or stainless steel. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- Cavity vent strip – PVC, aluminium or stainless steel, punched with 3 – 5 mm diameter holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- Flexible wall underlay – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breathable-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 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.)
- Rigid wall underlay – Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1 Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- Flexible sill and jamb flashing tape – flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1 Paragraph 4.3.1.1, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- 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.
- Aluminium joinery head flashings – as supplied by the joinery manufacturer or contractor.
- 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.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Mitten Vinyl Australia or the Mitten Vinyl licensed installer, whether on site or off-site, is under the control of the licensed installer.
- 5.2 Mitten Cambridge and Cedarline weatherboards and PVC accessories must be stacked flat, clear of the ground and supported on timber bearers along their entire length. They must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. If left in direct sunlight, wrapping should be cut open at the ends to allow for air movement. Do not store the cladding material in a location where the temperature may exceed 54°C, e.g. stacked on hot tarps or wrapped in plastic in the sun.
- 5.3 Care must be taken to avoid damage to edges and ends and the material must be stored away from areas where construction activity may cause damage.
- 5.4 All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Mitten Cambridge and Cedarline Vinyl Claddings. 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

Framing

Timber Framing

- 7.1 Timber wall framing behind Mitten Cambridge and Cedarline Vinyl 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 buildings within the scope limitations of NZS 3604. Buildings or parts of buildings 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. Stud must be at maximum 600 mm centres for buildings situated in NZS 3604 Wind Zones up to and including Very High. Stud must be at maximum 400 mm centres for buildings situated in NZS 3604 Wind Zone Extra High and specific design wind pressures up to and including design differential 2.5 kPa ULS. Drawings must be fitted flush between the studs at maximum 800 mm centres. Refer to Paragraphs 18.1 to 18.13 for information relating to the installation of the Mitten Cambridge and Cedarline Vinyl Claddings.
- 7.3 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of structural cavity battens and the Mitten Cambridge and Cedarline Vinyl Claddings.
- 7.4 Timber wall framing behind where weatherboards are joined over a cavity batten must be nominal 50 mm thickness (i.e. 45 mm minimum finished thickness).
- 7.5 Structural cavity battens must have a maximum moisture content of 20%, at the time of the cladding application.

General

- 8.1 Punching of the cavity vent strip must provide a minimum ventilation opening area of 1000 mm² per linear metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3(b).
- 8.2 The ground clearance to finished floor levels as set out in NZS 3604 must be adhered to at all times. At ground level, paved surfaces, such as footpaths, must be kept clear of the bottom edge of the cladding by a minimum of 100 mm, and unpaved surfaces by 175 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Table 18.

- 8.3 At balcony, deck or roof/wall junctions, the bottom edge of Mitten Cambridge and Cedarline Vinyl Claddings must be kept above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.6.
- 8.4 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 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate 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 cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

- 8.5 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the cavity and the flashing to the opening.
- 8.6 Where Mitten Cambridge and Cedarline Vinyl Claddings join to other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Some guidance is given within the Technical Literature. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

- 8.7 Inter-storey junctions must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

Structure

Mass

- 9.1 The mass of Mitten Cambridge and Cedarline Vinyl Claddings is approximately 8 kg/m², and they are therefore considered lightweight claddings in terms of NZS 3604.

Impact Resistance

- 9.2 Mitten Cambridge and Cedarline Vinyl Claddings have adequate resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the cladding system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

- 9.3 Mitten Cambridge and Cedarline Vinyl Claddings are 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 design differential ULS wind pressure where buildings are specifically designed. See Paragraph 7.2.

Durability

- 10.1 Mitten Cambridge and Cedarline Vinyl Claddings meet the performance requirements of NZBC Clause B2.3.1(b), 15 years for the cladding components.

Serviceable Life

- 10.2 Mitten Cambridge and Cedarline Vinyl Cladding installations are expected to have a serviceable life of at least 30 years for white (Frost), and at least 20 years for the remaining colours provided the cladding is maintained in accordance with the Technical Literature and this Appraisal.
- 10.3 On exposure to the environment, Mitten Cambridge and Cedarline Vinyl weatherboards will gradually lose gloss and coloured weatherboards will gradually fade.

- 10.4 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres 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 Exposure Zone D. To achieve a maximum serviceable life in Exposure Zone D, Mitten Cambridge and Cedarline Vinyl Cladding weatherboards and the structural battens supporting them must be fixed with stainless steel fasteners.
- 10.5 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 Mitten Cambridge and Cedarline Vinyl Claddings 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 cleaning of the surface of the cladding (at least annually) is required to remove grime, dirt and any organic growth and to maximise the life and appearance of the material. Grime may be removed by brushing with a soft brush, warm water and a mild detergent. Avoid the use of stiff brushes or abrasive detergents as these will affect the gloss finish of the product. A water-blaster must not be used on this cladding.
- 11.2 Annual inspections must be made to ensure that all aspects of the cladding, including flashings and any sealed joints remain in a weathertight condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately.
- 11.3 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the cladding.

Prevention of Fire Occurring

- 12.1 Mitten Cambridge and Cedarline Vinyl Claddings must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 to C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

Control of Internal Fire and Smoke Spread

- 13.1 Mitten Cambridge and Cedarline Vinyl Claddings meet the flame propagation criteria of AS 1366.3 as specified in NZBC Acceptable Solution C/AS1, Paragraph 4.2.2 and NZBC Acceptable Solution C/AS2 to C/AS6 Paragraph 4.17.2. The completed wall system, including the surface lining product enclosing the Mitten Cambridge and Cedarline Vinyl Claddings from the adjacent occupied space, must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solutions C/AS1 to C/AS6.

Control of External Fire Spread

- 14.1 Mitten Cambridge and Cedarline Vinyl Claddings do not have a peak heat release or total heat released rating. The system is suitable for use on buildings with a SH Risk Group classification, a maximum building height of 10 m and a distance of 1.0 m or more to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 – C/AS6 Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.
- 14.2 Buildings in all Risk Groups, apart from SH and V2, and three storeys or more, require horizontal fire stop barriers to be installed to external wall claddings incorporating an externally applied combustible insulant in accordance with NZBC Acceptable Solutions C/AS2 to C/AS6 Paragraph 5.7.17. Design of the barrier joint must be specifically detailed by the designer to meet the NZBC. NZBC Acceptable Solution C/AS2 – C/AS6, Figure 5.8 gives an acceptable detail for barriers. These joints are not covered by the Technical Literature, and therefore are outside the scope of this Appraisal.

External Moisture

- 15.1 Mitten Cambridge and Cedarline Vinyl Claddings, 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.
- 15.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.
- 15.3 Mitten Cambridge and Cedarline Vinyl Claddings allow excess moisture present at the completion of construction to be dissipated without permanent damage to building elements, and meets code compliance with Clause E2.3.6.
- 15.4 The details given in the Technical Literature for weather sealing are based on the 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.
- 15.5 Mitten Cambridge and Cedarline Vinyl Claddings, where there is a designed cavity drainage path for moisture that penetrates the cladding, do not reduce the requirements for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

16.1 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

16.2 Mitten Cambridge and Cedarline Vinyl Claddings are not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirements

17.1 Installation of Mitten Cambridge and Cedarline Vinyl Claddings must be completed by competent licensed installers with suitable training from Mitten Vinyl Australia and with an understanding of cavity construction, in accordance with instructions given within the Technical Literature and this Appraisal.

Mitten Vinyl Cladding Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

18.1 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 cladding system.

18.2 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. Generic rigid underlay materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems must be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building 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.

Structural Cavity Batten Installation

18.3 Structural cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The cavity battens must be fixed in place with flat head nails at 300 mm centres. The nail fixings must be staggered 12 mm either side of the batten centre line. Refer to Paragraph 4.2 for batten fixing options and refer to BRANZ Bulletin Number 475 for further information.

18.4 Where studs are at greater than 450 mm centres and a flexible wall underlay is being used, a building underlay support must be installed over the underlay at maximum 300 mm centres horizontally.

Aluminium Joinery Installation

18.5 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 – 10 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.

Mitten Vinyl Weatherboard Installation

18.6 Mitten Cambridge and Cedarline Vinyl Cladding weatherboards may be cut on site by power or hand saw. Holes and cut-outs may be formed by using a hole saw. Specific guidance on the cutting of the vinyl and polystyrene materials is given in the Mitten Cambridge and Cedarline Vinyl Claddings Technical Literature.

18.7 Mitten Vinyl weatherboards must be kept dry prior to installation.

18.8 Mitten Cambridge and Cedarline Vinyl Claddings must be installed starting at the bottom of the wall. The Mitten starter strip must first be fixed behind the bottom course of weatherboards to ensure that this first course is set out level. The starter strip is designed to establish a level bottom course and to overhang the bottom plate by the required minimum of 50 mm.

18.9 Before the vinyl weatherboards are installed, the corner details must be decided and plumbed vertically, e.g. corner-post profile for external corners and J-trims used to create internal corners. The necessary flashings must be installed before commencing weatherboard fixing and a cavity closure must be installed continuously around the bottom of all cavities.

18.10 Mitten Vinyl weatherboard vertical joints must be overlapped by the depth of the factory cut notch. The EPS backing of the cladding profile is designed to be butted tight.

18.11 Mitten Vinyl weatherboards are located in place by sliding the bottom of the new board up and into the lock profile on the top of the previously fixed weatherboard. Once the new weatherboard is located, it must be fixed with a screw and washer through the centre of each fixing slot at each stud.

Screws and washers must be placed in the centre of the slots to allow for thermal expansion and contraction movement. Screws and washers must not be driven home tight but left so that there is at least 1 mm of free-play between the washer and the vinyl profile. Failure to correctly place screws at the centre of fixing slots or their over-tightening will cause weatherboards to buckle or distort with heat.

18.12 Mitten Vinyl Weatherboards should be used in full lengths wherever possible. Where weatherboard and joints are required, the joint must be formed on a stud. Subsequent battens and joints in Mitten Vinyl Weatherboards must be staggered by at least 600 mm. No more than two joints are permitted in any vertical line and there must be no less than 3 rows of weatherboards between joints before repeating the joint position.

Finishing

18.13 Mitten Cambridge and Cedarline Vinyl weatherboards are pre-coloured at manufacture and factory finished with a gloss surface and require no on site finishing.

Inspection

18.14 The Technical Literature must be referred to during inspection of Mitten Cambridge and Cedarline Vinyl Cladding installations.

Health and Safety

19.1 Cutting of Mitten Vinyl weatherboards must be carried out in well ventilated areas and eye and hearing protection should be worn.

19.2 Safe use and handling procedures for the components that make up Mitten Cambridge and Cedarline Vinyl Cladding are provided in the manufacturer's Technical Literature. Sources of Information AS 1366.3:1992 Rigid cellular polystyrene – Moulded (RC/PS-M).

Basis of Appraisal

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

Tests

- 20.1 The following testing has been completed by BRANZ: BRANZ expert opinion on NZBC E2 code compliance for Mitten Cambridge and Cedarline Vinyl Claddings is based on testing and evaluation of all details within the scope and as stated within this Appraisal. Mitten Cambridge Vinyl Cladding details were tested to E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, vertical and horizontal weatherboard joints, internal and external corners. The results of the test were used in the evaluation of the Mitten Cambridge and Cedarline Vinyl Claddings. In addition to the weatherlightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for cavity-based weatherboard claddings.
 - 22.1 Wind face load and fastener pull through testing for Mitten Cambridge and Cedarline Vinyl Claddings determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

Other Investigations

- 21.1 Structural and durability opinions have been provided by BRANZ technical experts.
 - 21.2 The performance and history of use of vinyl weatherboard wall cladding products in New Zealand and Australia has been considered, including their structural and weatherlightness performance, durability and non-hazardous nature.
 - 21.3 Test results for flame propagation testing to AS 2122.1 of the EPS component of Mitten Cambridge and Cedarline Vinyl Claddings were obtained and reviewed by BRANZ technical experts. The review was satisfactory.
 - 21.4 Site visits have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.
 - 21.5 The Technical Literature for Mitten Cambridge and Cedarline Vinyl Claddings has been examined by BRANZ and found to be satisfactory.

Quality

22.1 The manufacture of Mitten Cambridge and Cedarline Vinyl Claddings has not been examined by BRANZ, however the methods adopted for quality control and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

22.2 Mitten Cambridge and Cedarline Vinyl Claddings manufactured at Mitten Inc. are subject to an annual manufacturing quality audit as part of the Vinyl Siding Institute Product Certification Program. The annual quality audit in turn supports ICC Evaluation and COMC Acceptance which are recognised by BRANZ.

22.3 The quality control system and manufacture of the polystyrene insert material used as a component of Mitten Cambridge and Cedarline Vinyl Claddings has been assessed as meeting the requirements of AS 1366.3 and is also covered by quality certification to ISO 9001:2008 by QAS International.

22.4 The quality of materials, components and accessories supplied to the market is the responsibility of Mitten Vinyl Australia.

22.5 Quality of installation on site of components and accessories supplied by Mitten Vinyl Australia is the responsibility of the Mitten Vinyl Australia licensed installer.

22.6 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing and joinery, wall underlays, flashing tapes and arseals.

22.7 Building owners are responsible for the maintenance of Mitten Cambridge and Cedarline Vinyl Claddings in accordance with the instructions of Mitten Inc.

- AS/NZS 1170:2002 Structural design actions.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber Structures Standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4211:2008 Specification for performance of windows.
- BRANZ Bulletin Number 475, August 2006, Structurally Fixed Cavity Battens.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2. Ministry of Building, Innovation and Employment, Third Edition July 2005 (Amendment 6, 14 February 2014).
- The Building Regulations 1992.



In the opinion of BRANZ, Milton Cambridge and Cedarline Vinyl Claddings are 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.

1. This approach means that in the context of a criminal matter:
- (a) would be used, treatment decisions will be made with the National Health Service, rather than with the Department of Health, and
- (b) when all other legal arguments fail, the Department, rather than the Health Service, will be responsible for the patient's care.

- [illegible]

For BRAND

P. Burghout
Chief Executive

Date of Issue- 20 March 2013

This Appraisal has been amended to add the Milton Cessline profile as a cladding option, and the Appraisal has also been amended to update Milner Vinyl Australia's address and to update firing options for structural cavity battens.

20.0 CERTIFICATIONS

Mitten Vinyl Cladding conforms and surpasses certification standards in many countries and has been BRANZ appraised in New Zealand.



Australia

AS/NZ S4256
Type B



Canada

Conforms to CAN/CGSB-41.24.95
CCMC Acceptance No. 06419L



USA

Conforms to ASTM 3679-94
Conforms to UBC Standard
14-2 NER 528 ER-5660

PRODUCT PHYSICALS			
TEST	STANDARD METHOD	UNITS OF MEASURE	RESULT
IZOD impact (0°C/32°F)	ASTM D-256	ft-lb/in	3.53
IZOD impact (23°C/73°F)	ASTM D-256	ft-lb/in	33.9
Tensile strength	ASTM D-638	Psi	8200
Modulus of elasticity	ASTM D-638	Psi	370000
Deflection temperature under load @264Psi	ASTM D-648	°F	163
Coefficient of linear expansion	ASTM D-696	x10 ⁻⁵ in/in/°F	4.3
Chemical resistance	ASTM D-543	-	excellent
Cell classification	ASTM D-1784	class #	13544-B
Compound Class	ASTM D-3679-89	class #	2

TABLE 1: Product Physicals

FIRE RELATED PROPERTIES		
Flame spread index fuel contribution	ASTM E84, UBC 42-1	18 0
self ignition temperature, °C	ASTM D-1929, UBC 52-3	432
smoke density rating (%) maximum smoke density (%) visibility of exit sign	ASTM D-2843, UBC 52-2	42.1 56.0 Good
total burn time, seconds extent of burning, mm	ASTM D-635	<5 <5

TABLE 2: Fire Related Properties

CLADDING/EXTRUDATE TYPICAL PHYSICAL PROPERTIES

TEST	STANDARD METHOD	UNITS OF MEASURE	RESULT
Impact resistance (73°F/23°C)	ASTM D-4226	in-lb/mil	2.57
mpact resistance (32°F/0°C)	ASTM D-4226	in-lb/mil	1.71
Low temperature flexibility	CGSB41-GP-24Ma	% pass	>80
Shrinkage / reversion	ASTM D-1042	%	<3.0
Surface Distortion	CGSB41-GP-24Ma ASTM D-3679-89	°F	>131
Minimum thickness	CGSB41-GP-24Ma	mm	1.0
Average thickness	-	inch	0.043
Normal thickness range	-	inch	.039 - .049
Impact resistance (73°F/23°C)	ASTM D-4226	in-lb/mil	2.57

TABLE 3: Cladding/Extrudate Typical Physical Properties

21.0 SUPPLEMENTARY INFORMATION

INSULATION CAPABILITY

CLIMATE ZONE	CONSTRUCTION R-VALUE REQUIREMENT	MINIMUM R-VALUE OF INSULATION REQUIRED
1 and 2	1.9m ² °C/W	#R2.0
3	2.0m ² °C/W	#R2.2

Total construction R-Value depends on the insulation material used and the framing ratio. The insulation material R-Values specified in this table are for studs spaced at 600mm centres and nogs spaced at 800mm centres. To achieve higher construction R-Values the wall insulation material must be replaced with an insulation material having higher R-Values to suit the requirements. For further guidance on insulation requirements please refer to www.branz.co.nz.

TABLE 4: Insulation Capability

RECOMMENDED ALLOWANCES FOR EXPANSION AND CONTRACTION

AMBIENT TEMPERATURE ON DAY OF INSTALLATION	TOTAL CLEARANCE TO ALLOW (MM)
0°C	2.0 mm per lineal metre of board length + 10mm
10°C	1.5 mm per lineal metre of board length + 10mm
20°C	1.0 mm per lineal metre of board length + 10mm
30°C	0.5 mm per lineal metre of board length + 10mm
40°C	0.0 mm per lineal metre of board length + 10mm

TABLE 5: Recommended allowances for expansion and contraction

22.0 IMPORTANT POINTS TO REMEMBER

Mitten Vinyl Cladding, like all building materials, expands and contracts with temperature changes. This expansion and contraction must be accounted for in advance to prevent the cladding from buckling which will mar the appearance of your home. The following rules, are critical for proper vinyl cladding installation:

1. Rule of thumb: Allow for movement - installed panels must move freely from side to side.
2. When installing a weatherboard panel, push up from the bottom until the lock is fully engaged with the piece below it. Do not force the panels up or down when fastening in position. Stretching the panel upward pulls the natural radius out of the panel and increases the friction of the locks.
3. Always fix in the centre of the slot.
WARNING: Do not fix at the end of the slot! Doing so will cause the panel to be permanently damaged. If you must fix near the end of the slot to hit a stud etc, extend the length of the slot with a slot punch tool. Do not fix through the cladding material unless stated elsewhere (ie: trims). Always fix towards the centre of the fixing slot. Always allow at least 3mm gap between the screw and the slot. Do not fix tight onto the weatherboards.
4. Do not drive the head of the screw tightly against the cladding fixing hem. Allow 1mm clearance between the screw head and the cladding panel. Drive screws straight and level to prevent distortion and buckling of the panel.
5. Leave a minimum of 5mm clearance at all openings and accessory channel stops to allow for normal expansion and contraction. When installing in temperatures below 5C, increase minimum clearance to 7-10mm.
6. Do not caulk the panels where they meet the receiver of inside corner posts, outside corner posts, or 'J' trim. Do not caulk the overlap joints.
7. Do not face-fix or staple through the cladding. Vinyl cladding expands and contracts with outside temperature changes. Face-fixing can result in ripples in the cladding.
8. In new construction, avoid the use of green timber as the underlayment. Keep in mind that exterior cladding can only be as straight and stable as what lies underneath of it.

23.0 MITTEN VINYL CLADDING WARRANTY

Mitten Vinyl Cladding is protected by a 50-year transferable warranty. Please refer to the following warranty for more detail.

The Mitten Warranty for foam-backed cladding can also be downloaded via this link:

<http://www.mittenvinyl.com/documents/Mitten%20Foam%20Back%20Warranty%20-%20English.pdf>



Your choice of Mitten premium vinyl siding guarantees quality and performance that will last a lifetime...we've put it in writing!

Mitten has been firmly established in the vinyl extrusion business since 1959. As an industry leader, our manufacturing facilities feature the most advanced technology and our products are tested to the highest standards.

Mitten manufactures vinyl siding, soffit and accessories of extraordinary durability due to our combination of advanced formulations and high standards of quality control.

MITTEN LIFETIME NON-PRORATED TRANSFERABLE LIMITED WARRANTY

Mitten proudly warrants the original purchaser of our siding for as long as the original purchaser is the owner of the property to which our products are applied.

The said products will be free from manufacturing defects. Any and all product failures covered by this Warranty as set forth will be remedied by Mitten AT NO COST TO THE ORIGINAL HOMEOWNER, if the defect is reported in accordance with the terms thereof.

The Lifetime non-prorated coverage in this warranty is designed to cover individual homeowners only. In the instance of siding purchased by or installed upon property owned by, for example, corporations, governments, condominiums or premises not used by individual homeowners at their residences, the warranty period will be fifty years following the installation of the siding and it will be prorated as indicated herein. For such purchasers or entities to which the prorated coverage applies, the warranty is transferable to a new owner by the original purchaser under the terms and conditions set forth herein, in which event it will cover the period of fifty years following the installation of the siding (prorated as indicated herein).

HAIL DAMAGE

Every piece of Mitten vinyl siding is manufactured with excellent impact resistance. Mitten warrants to the original owner that should the siding receive damage from a hail storm, Mitten will provide replacement material to cover those pieces which received damage and provided that such damage is not covered by the homeowner's insurance policy or other insurance coverage. The homeowner shall be responsible for the payment of all installation, labor and freight costs associated.

UNIFORM WEATHERING

The term "uniform weathering" means the appearance of the color of the siding and does not refer to the straightness or the even or level wall appearance of the siding. Exposure to exterior elements can be expected to cause gradual and uniform color changes. This can vary, dependent on geographical location and wall exposure. Mitten warrants that its products will weather in a uniform manner. A defect will be defined as any weathering changes that occur on a specific wall exposure in a manner that varies from panel to panel (checkboard effect). It is normal for a weathered siding material to have slight and unobjectionable shade differences underneath the butt (or shadow line) portions of the panel - as well as underneath protected eaves and overhang areas.

COLOR-RICH COVERAGE

Mitten, at its discretion, shall determine whether the siding is suffering from abnormal fading or normal weathering. This conclusion shall be based on whether the siding shows a change in color in excess of the Hunter units as calculated according to ASTM D2244. Designer and Premium Formulations are guaranteed against fade of 3 Hunter Units. PVC formulations are guaranteed against fade of 4 Hunter Units. This fade warranty will last as long as Mitten's Lifetime Limited warranty lasts and upon transfer with the Property, shall continue based upon the coverage terms for Mitten's Lifetime Limited Warranty.

Siding which experiences color change due to normal weathering is excluded from this warranty.

CONDITIONS OF THIS WARRANTY

This Warranty covers only defects in the manufacture of Mitten vinyl siding and accessories. It does not cover damage to such products caused by faulty installation, settlement of the building, failure of the structure (including foundations and walls), fire, wind, flood, lightning, or other acts of God, intentional acts, failure to provide reasonable and necessary maintenance, accidental damage or negligence, or exposure to atmospheric pollution, acid rain, salt spray, harmful chemicals or vapors. Mitten vinyl siding and accessories are not warranted in the event that least sources, such as BPOs, argon gas glass units or other items that can reflect heat over and above 180°F, are located in close proximity of the installed vinyl product.

If a homeowner neglects to keep the solid vinyl siding surface clean and a harmful surface buildup is allowed to occur, restoration of the wall appearance to a fresh and clean condition can become a difficult task. In such cases, it is specifically the homeowner's responsibility and not the responsibility of either Mitten or the installing contractor to restore the wall surface to a clean and fresh condition.

REMEDIES

If your product contains manufacturing defects covered by this Warranty, Mitten will incur the costs (material and labor) to repair or replace the defective part or portion of Mitten Vinyl Siding and Accessories.

All warranty work will be performed by Mitten or a designated agent selected by Mitten. Any repair or replacement not authorized by Mitten shall release Mitten from any and all warranty obligations concerning the product. All warranty work will be performed no later than one hundred sixty (160) days after notice is received unless adverse weather conditions prevent repair or replacement from being completed within the one hundred sixty (160) day period. If no repair or replacement will be completed as soon after the 160-day period as weather conditions will reasonably permit, Repair will be performed at the annually agreed time by the customer and the designated agent. Mitten reserves the right to discontinue or modify any of its products, including the color thereof, without notice to the homeowner and shall not be liable to the homeowner/contractor as a result of such discontinuance or modification, nor shall Mitten be liable in the event replacement material may vary in color or gloss in comparison to the original products as a result of normal weathering. If Mitten replaces any material under warranty, it may substitute product designated by Mitten to be of comparable quality or price range in the event the product initially installed has been discontinued or modified.

Mitten shall have sole discretion to determine whether the siding is suffering from normal weathering. In the event that the siding weathers to a degree which is determined by Mitten to be beyond normal, then Mitten shall, at its option, either apply a special coating to any siding determined to have weathered beyond normal or perform the necessary repairs as outlined above.

THE REMEDIES PROVIDED FOR HEREIN ARE EXCLUSIVE WHETHER FOR BREACH OF IMPLIED WARRANTIES, IMPLIED WARRANTIES, WARRANTIES OF MERCHANTABILITY OR OTHERWISE, AND MITTEN MAKES NO IMPLIED WARRANTIES OTHER THAN AS SPECIFICALLY SET FORTH HEREIN. IN NO EVENT SHALL MITTEN BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. Some jurisdictions do not allow the exclusion or limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This Warranty gives you specific legal rights and you may have other rights which vary between jurisdictions.

OBTAINING PERFORMANCE OF THIS WARRANTY - ORIGINAL OWNER

The procedure for obtaining performance of this Warranty is simple. If you feel that our product contains manufacturing defects simply write to: Warranty Claims, attention of Quality Assurance Manager, P.O. Box 2005, 70 Curtis Avenue North, Port, Ontario, Canada, N1L 3T2 briefly explaining your complaint. Accompanying the complaint must be a proof of purchase and installation along with proof of property ownership. Appropriate photos can be required along with a sample of the alleged defect for laboratory analysis.

IMPORTANT: ALL CLAIMS UNDER THIS WARRANTY MUST BE REPORTED TO MITTEN WITHIN SIXTY (60) DAYS FROM THE DATE THAT THE DEFECT IS FIRST DISCOVERED OR REASONABLY COULD HAVE BEEN FIRST DISCOVERED.

Mitten will reply within a reasonable period of time from receipt of your complaint. Further, Mitten reserves the right when necessary to inspect any damage or defects within a reasonable period of time after the claim is made.

TRANSFER OF THE WARRANTY - SUBSEQUENT OWNER

This Warranty is transferable to a new owner. In the event of transfer of this warranty, the warranty period shall be for fifty (50) years from the original date of purchase installation and shall be prorated as indicated on the reverse side of this warranty. The original purchaser is responsible to have the warranty card with the attached proof of purchase with the subsequent home owner.

MITTEN

This is to certify that Mitten vinyl siding, soffit and/or accessories have been installed at the residence of:
Name: _____
Address: _____

Date of Installation: _____
Homeowner: _____
Contractor: _____

WARRANTY



WARRANTY CLAIM SCHEDULE

Claims Made By: Original Purchaser, Subsequent Owner,
(where Mitten has received timely notice of transfer as specified
on the reverse hereof.)

Number of Years (after original installation) Within Which Claim is Made	Percentage of Costs Borne by Mitten
Lifetime of Original Purchaser	100%
0 - 5 Years	100%
6 Years	90%
7 Years	80%
8 Years	70%
9 Years	60%
10 Years	50%
11 Years	40%
12 Years	30%
13 Years	20%
14 - 15 Years	10%
More than 15 Years	0%

YOUR MITTEN SOLID VINYL SIDING IS BEAUTIFUL. HERE IS HOW TO KEEP IT THAT WAY.

While Mitten solid vinyl siding comes close to being virtually maintenance free, it will become dirty just as does a freshly painted house or a new automobile or any other product that is exposed to atmospheric conditions. Generally, your Mitten solid vinyl siding can be cleaned satisfactorily with the use of an ordinary garden hose.

If this does not do the job, then we suggest the following:

1. Equip the garden hose with a soft bristled, long-handle car brush for example.
 2. Where soil is of a stubborn nature (as frequently found in industrial areas) the following cleaning solution works well: 1/3 c. detergent (Tide as an example) + 2/3 c. trisodium phosphate (Sodax as an example) + 1 gallon of water.
- In certain geographic areas where mildew may be a problem, rubidium one quart of 5% sodium hydrochloride (Clorox for example) for one quart water in the above formula.
- When mildew stains must be removed from the panel, an abrasive-type cleanser (Comet or Ajax for example) or SOS pads may be used without damage to the siding. The most damage that can be done to the panel of solid vinyl siding is to scratch or roughen the surface. This, however, is rarely visible a few feet away from the house.
- Where the house is extremely dirty, it is recommended that you start washing from the bottom and go to the top, rinsing frequently. Cleaning solutions should be permitted to stand on the surface of the siding for several minutes before rinsing.

STAIN	CLEANERS*	STAIN	CLEANERS*
Bubble Gum	Fantastic, Murphy's Oil Soap, or solution of vinegar (50%) and water (70%)	Mold and Mildew	Fantastic, Murphy's Oil Soap, or solution of vinegar (50%) and water (70%)
Crayon	Lysol	Motor Oil	Fantastic, Lysol, Murphy's Oil Soap or Windox
DAP (Oil Based Caulk)	Fantastic	Paint	Brillo Pad or Soft Scrub
Felt-tip Pen	Fantastic or water-based cleanser	Pencil	Soft Scrub
Grease	Fantastic, Lysol, Murphy's Oil Soap or Windox	Rust	Fantastic, Lysol, Murphy's Oil Soap or Windox
Lithium Grease	Fantastic, Lysol, Murphy's Oil Soap or Windox	Tar	Soft Scrub
Oil	Soft Scrub	Top Soil	Fantastic, Lysol or Murphy's Oil Soap

Follow the precautionary instructions on the cleaning agent container. Protect plants from direct contact with cleaning agents. For further information on caring for your vinyl siding, please visit www.vinylsiding.org/brochiding

*Mitten does not endorse proprietary products or processes and makes no warranties for the products mentioned herein. Reference is proprietary names is for illustrative purposes only and is not intended to imply that there are not equally effective alternatives.

MKT 0013

40-710-000-00