shadowclad®

SHADOWCLAD® STRUCTURAL Natural GROOVE | SHADOWCLAD® STRUCTURAL Natural TEXTURE | SHADOWCLAD® STRUCTURAL Ultra GROOVE | SHADOWCLAD® STRUCTURAL Ultra TEXTURE | SHADOWCLAD® FLASHINGS

SHADOWCLAD® SPECIFICATION & INSTALLATION GUIDE

FOR CAVITY CONSTRUCTION

SEPTEMBER 2015

CarterHoltHarvey Woodproducts New Zealand

Information contained within is specific to Shadowclad® structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

shadowclad®

CAVITY CONSTRUCTION

Contents

CarterHoltHarvey
Woodproducts New Zealand

1.0 SHADOWCLAD® PRODUCT RANGE

Manufactured in New Zealand by Carter Holt Harvey® Woodproducts, Shadowclad panels are suitable for use as an exterior wall cladding when using H3 treated panels or as an internal wall or ceiling lining when using untreated panels.

Shadowclad is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural. All Shadowclad products carry Engineered Wood Products Association of Australasia (EWPAA) Joint Accreditation System – Australia and New Zealand (EWPAA/JAS-ANZ) certification.

Shadowclad has been BRANZ appraised as a cladding material for cavity wall construction. To view the appraisal visit www.chhwoodproducts.co.nz.

For information relating to Ecoply® structural plywood and applications other than exterior cladding, refer to the current Ecoply Specification & Installation Guide. For specific information on plywood as a rigid air barrier, and/or bracing, refer to the current Ecoply Barrier Specification and Installation Guide. These are both available to be downloaded from www.chhwoodproducts.co.nz.

The Shadowclad BRANZ Appraisal No. 764 (2011) does not cover:

- Shadowclad® used as an interior lining
- Handiply® Utilityclad™ plywood products
- Shadowclad® in direct fix cladding applications

Shadowclad products must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage. This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Shadowclad products. However, to the maximum extent permitted by law, Carter Holt Harvey assumes no legal liability to you in relation to this information.

1.1 TECHNICAL INFORMATION AND CAD DETAILS

When specifying or installing any Shadowclad product visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

Having trouble installing Shadowclad visit www.chhwoodproducts.co.nz to view the installation of common Shadowclad junctions.

The information contained in this document is current as at September 2015. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Shadowclad structural plywood products manufactured by Carter Holt Harvey Woodproducts and must not be used with any other plywood manufacturer's products no matter how similar they may appear.

Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Shadowclad structural plywood products is not appropriate, and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the NZBC.

1.2 PRODUCT DESCRIPTION AND RANGE

Shadowclad structural plywood panels are manufactured from radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

Shadowclad is available in panel sizes 2440 / 2745 x 1216mm (to provide 1200mm cover) and features a unique textured (bandsawn) appearance which also helps to diffuse UV rays for increased aesthetic performance when exposed to weather.

Shadowclad is available as a Textured or Grooved profile and in either Natural or Ultra finishes.

Shadowclad Natural

Shadowclad Natural is an uncoated panel suitable for use with penetrating stains, film forming stains and paint systems. If Shadowclad is left uncoated or is clear coated in exterior applications the long term aesthetics of the board will be significantly reduced. While the product will meet the B2 and E2 durability and weathertightness requirements for cladding, a high visual appearance will not be achieved in the long term.

Shadowclad Ultra

Shadowclad Ultra features a factory applied exterior grade performance coating suitable for use with most paint and film forming stain systems. Using a unique powder coating process on the panel face and edges means Ultra panels can be immediately top coated on site, eliminating (in most cases) the need for expensive and time consuming wet primers.

CHH Woodproducts recommends the use of Shadowclad Ultra where suitable paint or film forming stains are being used.

Shadowclad Ultra features:

- High 60-80 microns film build, can be up to 2-3 times thicker than traditional wet primers
- Continuous powder coated surface forms an effective moisture barrier for a drier more consistent painting surface
- Saves time and money as traditional wet primers are not normally required
- Panel surface, edges and bottom 150mm of sheet factory coated for increased panel durability
- Once installed Shadowclad Ultra can be exposed to weather for up to 3 months prior to application of finishing coats
- Low volatile organic compound (VOC) primer coating

Shadowclad Ultra is available H3 treated for use as an exterior cladding. It is available H3.1 LOSP treated for residential and commercial applications or H3.2 CCA if required. H3.2 CCA treatment is only available in the Ultra finish and is not available with Natural finish products.

Shadowclad Ultra is not suitable for use with penetrating stains. The selection, application and maintenance of coatings is the responsibility of the building owners and the professionals that they engage. For advice on specific coating systems and their suitability for use with Shadowclad Ultra, always refer to the coating manufacturer.

Table 1 Surface finishes

Natural		**Ultra**	
Texture	Groove	Texture	Groove
			
Shadowclad Natural is an uncoated panel suitable for staining and painting. Untreated panels can be clear coated for internal, dry applications.		Shadowclad Ultra features a performance coated surface ready for top coating saving time and money when using paints and film forming stains. It is suitable for use in exterior applications only.	

Table 2 Shadowclad Product Range

	Texture	**Groove**
Finish	Natural or Ultra	Natural or Ultra
Sheet Length	2440 & 2745mm	2440 & 2745mm
Width (overall)	1216mm	1216mm
Width (effective)	1200mm	1200mm
Cover / Width Tolerance	+/ –1mm	+/ –1mm
Nominal Thickness	12mm	12mm
Weight (kg/m²)	6.6	6.6
R-value (m².C/W)	0.104	0.104
Groove Profile	N/A	9mm wide, 5mm deep at 150mm centres
Edge Profile	Shiplap with weather groove	Shiplap with weather groove
Treatment Available	• H3.1 LOSP (Azole) • H3.2 CCA (Ultra finish only) • Untreated – internal dry applications (Natural finish only)	• H3.1 LOSP (Azole) • H3.2 CCA (Ultra finish only) • Untreated – internal dry applications (Natural finish only)

Shadowclad™ Exterior Flashing Range

Manufactured from extruded aluminium or folded from 0.5 mm thick G304 stainless steel, the Shadowclad™ flashings range is purpose designed to complement Shadowclad panels used in exterior applications.

Independently tested for weathertightness and compliant with Table 20 of E2/AS1, Shadowclad™ flashings achieve 50 year durability in all NZS 3604 exposure zones including zone D (sea spray).

The range includes internal and external angles, horizontal and inter-storey 'Z' flashings and a cavity base closure.

Aluminium horizontally installed flashings come in 3600mm lengths and vertically installed angles are available in 3000mm & 6000mm lengths - refer Table 3. Stainless Steel flashings are available in 3000mm lengths - refer Table 4.

The information, details and performance statements provided in this guide are based on Shadowclad plywood panels and Shadowclad™ flashings being used together as a system. CHH Woodproducts does not recommend that Shadowclad plywood panels be installed with non-CHH Woodproducts flashings. Flashings not supplied by CHH Woodproducts must, as a minimum, comply with E2/ AS1 specifications and be compatible for use with H3.1 LOSP or H3.2 CCA treated plywood. It is the Designer's responsibility to ensure that any non-CHH Woodproducts flashings are fit for purpose and compatible with Shadowclad products and any other building materials or components of the exterior wall.

Aluminium Flashing Finishes

Shadowclad™ aluminium flashings are available in either natural anodised finish (silver colour) for immediate installation or mill finished allowing customers to powder coat flashings to any desired colour finish.

Refer to your local powder coating supplier for more information.

Exterior Flashings & H3.2 CCA Treated Shadowclad®

Exposure Zone B & C

H3.2 CCA treated Shadowclad in exposure zones B and C (where flashings are exposed to weather) must use mill finished flashings which must be powder coated to the desired colour or use stainless steel flashings.

H3.2 CCA treatment contains copper. As such, some form of isolation between aluminium flashings and H3.2 CCA treated panels such as powder coating of the flashings is required. Refer to Table 21 "Compatibility of Materials in Contact" in E2/AS1 for more information.

Exposure Zone D (Sea Spray)

In exposure zone D (sea spray) flashings exposed to weather must be stainless steel for H3.2 CCA treated Shadowclad.

H3.2 CCA Treated Shadowclad

Uncoated aluminium flashings are not permitted to be in direct contact in any zone with H3.2 CCA treated Shadowclad under any circumstances.

For further information relating to H3.2 CCA treated Shadowclad contact CHH Woodproducts on 0800 326 759

Table 3 **Aluminium** **Shadowclad™ Flashings Range**

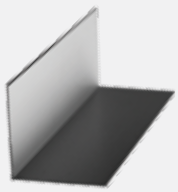
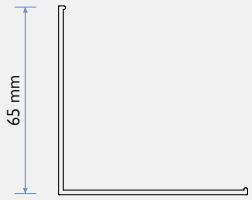
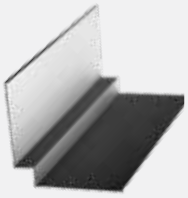
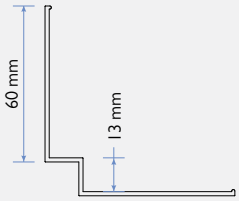
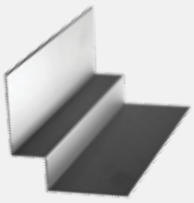
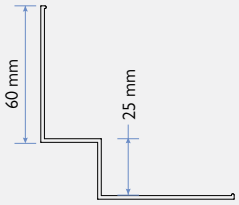
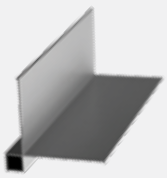
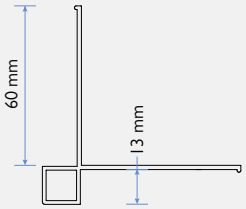
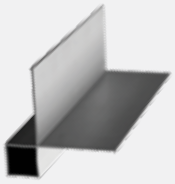
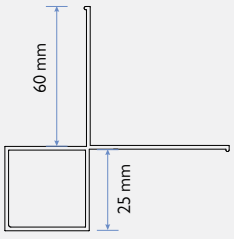
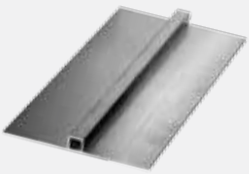
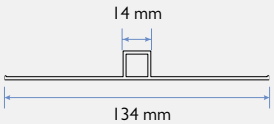
Flashing	Line Drawing	Description	Finish Available	Length (mm)
Internal 90° Angle			Back flashing for internal corners	Natural Anodised	3000 6000
Internal 'W' Angle			'W' back flashing for internal corners providing a flush finish with panels (13mm x 13mm)	Natural Anodised Mill	3000 6000
Large Internal 'W' Angle			'W' back flashing for internal corners (25mm x 25mm) **Design Tip:** Use a Large 'W' where a flush junction between the Horizontal 'Z' flashing and corner flashing is desired	Natural Anodised Mill	3000 6000
External Box Angle			Box corner for external corners providing a flush finish with panels	Natural Anodised Mill	3000 6000
Large External Box Angle			Box corner for external corners (25mm x 25mm) **Design Tip:** Use Large External Box where a flush junction between the Horizontal 'Z' flashing and corner flashing is desired	Natural Anodised Mill	3000 6000
Vertical Top Hat			Vertical sheet joint flashing	Natural Anodised Mill	3000 6000

Table 3 **Aluminium** **Shadowclad™ Flashings Range**

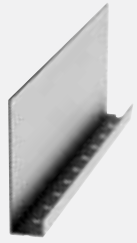
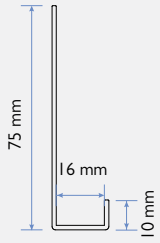
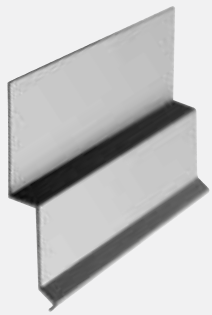
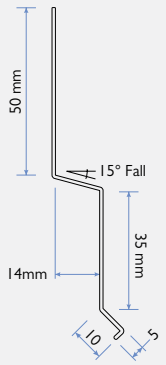
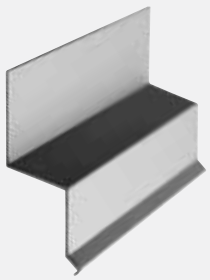
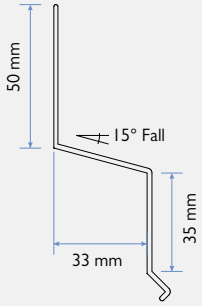
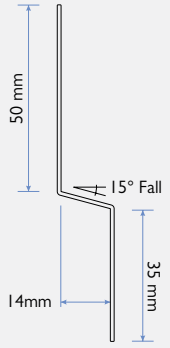
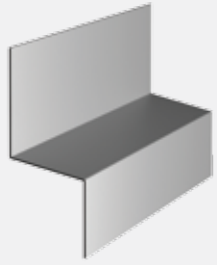
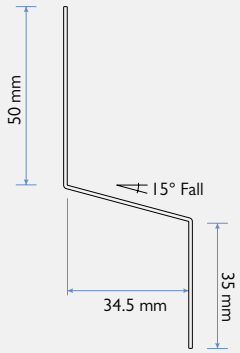
Flashing	Line Drawing	Description	Finish Available	Length (mm)
Cavity Base Closure 		Restricts vermin from accessing the cavity space	Natural Anodised	3600
Horizontal 'Z' Flashing 		Horizontal Z flashing for horizontal joints between panels	Natural Anodised Mill	3600
Inter-Storey 'Z' Flashing 		Horizontal Z flashing for horizontal joints between panels when limiting continuous cavities to a height of two storeys or 7 meters	Natural Anodised Mill	3600
Horizontal 'Z' Back Flashing 		Back flashing for junction of butt jointed horizontal 'Z' flashing.	Mill	300
Inter-storey 'Z' Back Flashing 		Back flashing for junction of butt joint 'Z' Flashing inter-storey.	Mill	300

Table 4 **Stainless Steel** **Shadowclad™ Flashings Range**

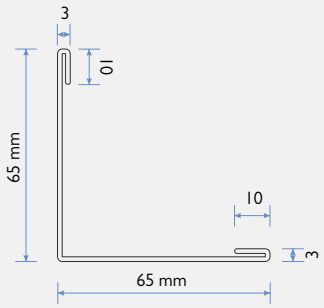
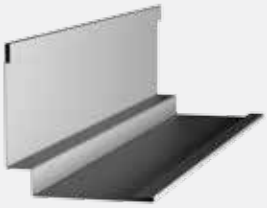
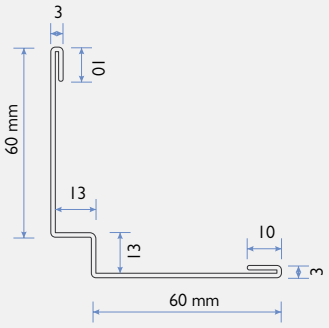
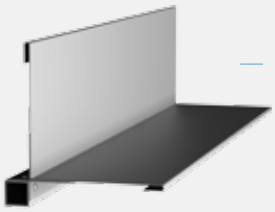
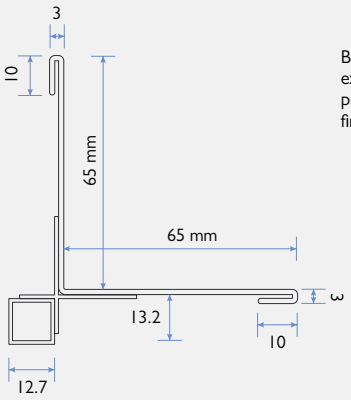
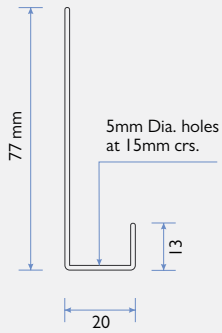
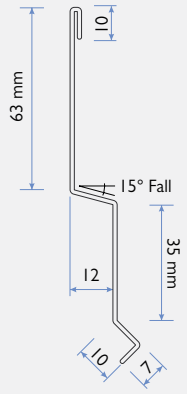
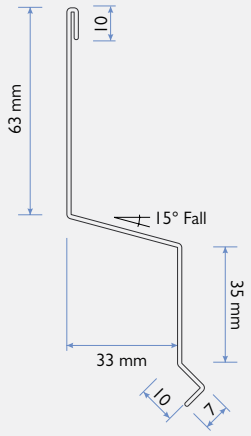
Flashing	Line Drawing	Description	Finish Available	Length (mm)
Internal 90° Angle			Back flashing for internal corners	Stainless Steel	3000
Internal 'W' Angle			'W' back flashing for internal corners providing a flush finish with panels (13mm x 13mm)	Stainless Steel	3000
External Box Angle			Box corner for external corners providing a flush finish with panels	Stainless Steel	3000
Cavity Base Closure			Restricts vermin from accessing the cavity space	Stainless Steel	3000

Table 4 **Stainless Steel** **Shadowclad™ Flashings Range**

Flashing	Line Drawing	Description	Finish Available	Length (mm)
Horizontal 'Z' Flashing			Horizontal Z flashing for horizontal joints between panels	Stainless Steel	3000
Inter-Storey 'Z' Flashing			Horizontal Z flashing for horizontal joints between panels when limiting continuous cavities to a height of two storeys or 7 meters	Stainless Steel	3000

1.3 BUILDING MATERIALS FOR USE WITH SHADOWCLAD (EXTERIOR CLADDING)

Table 5 Materials available from CHH Woodproducts

	Description	Treatment	Size/Length
Frame Flashing Tape[1]	For a secure and permanent seal of all Ecoply Barrier openings (Use in conjunction with Sill Tape)	-	150mm / 200mm x 30m
Sealing Tape[1]	For a secure and permanent seal of all Ecoply Barrier vertical joints	-	60mm x 30m
Sill Tape[1]	One piece stretchable sill tape for window and door sills. 2 rolls per box.	-	150mm / 200mm x 20m
Ecoply® Barrier[1]	Rigid Air Barrier System	H3.2 CCA	2440mm / 2745mm x 1200mm
Cavity Batten	45 x 20mm (nominal)	H3.1 LOSP	Random
Flashings	Aluminium and stainless steel flashings range	Refer Tables 3 & 4	Refer Tables 3 & 4

1 Please refer to the Ecoply Barrier Specification and Installation Guide for more information.

Building Materials Supplied by Other Manufacturers

- Fasteners (i.e. nails or screws) in accordance with Table 8: Fastener Lengths for Shadowclad fixing
- Building underlay compliant with Table 23 of E2/AS1
- Window/door head flashings supplied by window joinery company
- Paint in accordance with paint manufacturer's recommendations (refer to 5.3 Coating Selection for more details).

1.4 PRESERVATIVE TREATMENT

Shadowclad is available either H3 treated for use as an exterior cladding or untreated (Natural finish products only) for interior wall and ceiling linings. H3 treated Shadowclad is treated in accordance with AS/NZS 1604.3 with the standard treatment for Shadowclad panels being H3.1 LOSP (Azole). H3.2 CCA treatment is available for Shadowclad Ultra panels if required.

Shadowclad is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Holdfast® Metalex® Concentrated Timber Preservative Clear (Holdfast® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

H3.1 LOSP Treatment

H3.1 LOSP treatment is the standard treatment for Shadowclad panels as it does not discolour the panel surface and does not use water in the treatment process allowing panels to remain at uniform dimensions.

When coating H3.1 LOSP treated plywood some residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

Mechanical fasteners are required to fix H3.1 LOSP treated Shadowclad to framing. Do not glue Shadowclad to frames.

H3.2 CCA Treatment

H3.2 CCA uses water during the treatment process and may leave panel surfaces with a slight green colour. For this reason H3.2 CCA treatment is available only in the Shadowclad Ultra finish.

Table 6 Preservative treatment options

	Untreated	H3.1 LOSP (Azole)	H3.2 CCA
Preservative carrier	N/A	Light organic oil (white spirits)	Water
Colour	Natural	Natural	Green
Fungicide	Heat treated dry wood	Propiconazole and Tebuconazole	Copper
Insecticide	Heat treated dry wood	Permethrin	Arsenate
Other chemicals	N/A	Butyl Oxitol (co-solvent to assist active stability)	Chrome (to fix preservative in water)
Mouldicide	N/A	IPBC	Copper (limited efficiency)
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Solvent does not affect dimensions. Solvent smell disappears when exposed to air flow	Dried after treatment to average 18% moisture content
Applications (Refer NZ3602)	Interior dry protected	Exterior (service performance subject to detailing & coatings used)	Exterior (service performance subject to detailing & coatings used)

1.5 SUSTAINABILITY

Shadowclad is manufactured from radiata pine. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Shadowclad is manufactured in New Zealand at CHH Woodproducts Tokoroa plywood mill.

Shadowclad is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, every sheet of Shadowclad plywood has the following information marked on the back:

- Brand name: eg.SHADOWCLAD
- Intended application: eg. STRUCTURAL
- Glue bond: eg. A BOND
- Formaldehyde emission class: eg. E0
- Australasian Standard: eg. AS/NZS 2269:2012
- Treatment Standard (if applicable) eg. AS/NZS 1604.3:2012
- Date and time of manufacture: eg. 01/12/15 12:34:56
- The Engineered Wood Products Association of Australasia (EWPAA) brand and mill number: e.g. 911 (Tokoroa mill)

Treated example:

SHADOWCLAD STRUCTURAL A BOND
E0 AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 400 64 H3 E LOSP
RETREAT CUTS PAT 01/12/15 12:23:45
911

Untreated example:

SHADOWCLAD STRUCTURAL A BOND
E0 AS/NZS 2269.0:2012
UNTREATED – FOR INTERNAL USE
ONLY PAT 01/12/15 12:23:45
911

2.0 DESIGN CONSIDERATIONS

2.1 DESIGN RESPONSIBILITY

Design responsibility lies with the building owner and the professionals that they engage. The specifier for the project must ensure that the details in the specification for their individual projects are appropriate for the intended application. The specifier must also ensure that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature. It is the specifier's responsibility to ensure that non-CHH products are fit for purpose, and compatible with Shadowclad products.

Good detailing which avoids moisture or dust accumulation on the sheet surface can help increase durability and aesthetics. Roof overhangs contribute to performance as they offer shade and will protect walls from rain and dust. Trims should be bevelled to shed moisture and flashings should be detailed with gaps that do not trap water at the panel edges.

2.2 LITERATURE SCOPE

Shadowclad can be used for those structures which fall within the scope of Acceptable Solution E2/AS1- External Moisture. Shadowclad is recommended for a drained and ventilated cavity, where the cladding is fixed onto timber battens fixed over the timber frame and building underlay.

Shadowclad is not recommended where a risk score >20 in accordance with E2/AS1 is established.

2.3 CODE COMPLIANCE

Shadowclad on a cavity wall system is tested in accordance with E2/VM1 and AS/NZS 4284 "Testing of Building Facades" for compliance with the NZBC Clause E2 - External Moisture.

2.4 SITE & FOUNDATIONS

The site on which the building is situated must comply with the Acceptable Solution E1/AS1 of the Approved Document for the NZBC Clause E1 - Surface Water.

2.5 GROUND CLEARANCES

The bottom edge of each Shadowclad sheet must be a minimum of 50mm above decks and verandahs, 100mm above paved ground and a minimum of 175mm above unprotected ground.

Shadowclad must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604 and E2 - External Moisture. Maximum distance from the bottom of the sheet to the fixing shall not exceed 75mm.

For garage door openings, refer Paragraph 9 "Openings to garages" in Acceptable Solution E2/AS1.

2.6 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design and site exposure.

Wall construction design must effectively manage moisture, accounting for both the interior and exterior environments of the building. This is particularly important in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled.

Where a deck is attached to the building and the Shadowclad extends below the deck to cover the framing, keep decking clear of the Shadowclad surface and detail to avoid moisture entrapment.

All wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate Shadowclad™ flashings for waterproofing. Materials, components and the installation used to manage moisture in framed wall construction must, at a minimum, comply with the requirements of the NZBC.

2.7 WIND LOADING

Shadowclad is suitable for use in all wind zones up to and including extra high (55 m/s) as defined by NZS 3604 and specific design wind pressures up to design differential ultimate limit state (ULS) of 2.5 kPa.

2.8 DURABILITY

The durability level applicable to Shadowclad is dependent upon the application and coating applied. Detailing, treatment and installation methods need careful consideration to satisfy the requirements of the NZBC.

Internal Linings – 50 year Durability

Untreated Shadowclad used in dry, interior situations will meet the requirements for 50 year minimum durability if coated or uncoated.

Exterior Cladding – 15 year Durability

CHH Woodproducts does not recommend Shadowclad is left uncoated when used as an exterior cladding.

The NZBC Clause B2 requires claddings to achieve a minimum structural durability level of 15 years.

Shadowclad coated with stains or paints (regardless of colour choice) will meet this requirement. If using dark colours (colours with an LRV of less than 50%) homeowners should expect an increased level of coating maintenance over the life of the cladding than would normally be expected where lighter colours are used.

Using dark colours with an LRV of less than 50% and failure to adequately maintain the surface coating of the cladding increases the risk of aesthetic related issues such as face checking.

Additional Notes:
For further advice on coatings refer to section 5.0: Coating and Application – Exterior Cladding.

2.9 TEXTURED VS. SMOOTH FINISHED PLYWOOD AS EXTERIOR CLADDING

Structurally, some smooth faced plywood products may meet the requirements of E2/AS1 however in CHH Woodproducts opinion smooth faced plywood does not retain a high visual appearance when directly exposed to weathering.

Where a high visual appearance is desired (such as exterior cladding) CHH Woodproducts recommends the use of Shadowclad rather than smooth faced plywood.

Shadowclad features a textured (bandsawn) face which reduces the visibility of natural face checking which can occur in any wood based product which has been exposed to weather for a prolonged period.

Face checks are not considered a manufacturing fault as they are part of a natural process and are merely an indication that it is time to re-apply the surface coating on the product.

2.10 HEALTH & SAFETY

Shadowclad should be installed and used as per the Material Safety Data Sheet (MSDS) which can be downloaded from www.chhwoodproducts.co.nz.

Always wear safety glasses or non-fogging goggles when cutting Shadowclad panels and flashings.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn.

Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

2.11 STORAGE & HANDLING

Shadowclad panels:

- Keep Shadowclad panels dry
- Store under cover
- Handle and stack with care to avoid damage
- Stack flat; clear of ground, on at least three evenly spaced bearers
- Store in well-ventilated areas away from sources of heat, flames or sparks

Shadowclad™ flashings:

- Keep dry. Should a shipment of Shadowclad™ flashings arrive in a wet condition, they should be immediately dried before storing
- When storing flashings avoid contact with other metals which may cause scratches or marks. The use of shelving or racks faced with dry wood is recommended
- Keep away from caustics, nitrates and acids

3.0 INSTALLATION – INTERIOR LININGS

The use of untreated Shadowclad is acceptable under NZS 3604, NZBC for internal wall and ceiling linings where NZS 3602 allows the use of untreated plywood.

For detailed installation advice for plywood used as an internal lining refer to the Internal Linings Technical Bulletin, which is available to be downloaded from www.chhwoodproducts.co.nz.

4.0 INSTALLATION – EXTERIOR CLADDING

4.1 FRAMING – DURABILITY

Refer to NZBC Acceptable Solution B2/AS1 "Durability". External timber framing must be treated to a minimum H1.2 treatment. For timber treatment and allowable moisture content, refer to NZS 3602 as well as framing manufacturer's literature (e.g. Laserframe®). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz.

4.2 FRAMING – CONSTRUCTION

Use kiln dried framing such as Laserframe in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz.

Timber frame sizes and set out must comply with NZS 3604 (or specifically designed to NZS 3603) and with stud and nog centres and timber width required by this specification.

All Shadowclad sheet edges must be fully supported by framing.

- Studs must not exceed 600mm centres
- Nogs must be provided at a maximum of 800mm centres
- An extra stud is required at internal corners for ventilated cavities
- Refer to NZS 3602 for moisture content requirements as a guide, frame and cavity batten moisture content should be no greater than 20%
- Framing must be kept as dry as possible at all times
- Single spans of Shadowclad should not exceed 600mm (e.g. Below windows or balustrades)

4.3 PREPARATION – BUILDING UNDERLAY & RIGID AIR BARRIER

The use of building underlay compliant with Table 23 of E2/AS1 or an alternative solution rigid air barrier must be provided over framing prior to the installation of exterior cladding

- Barriers to air flow are required
- Rigid air barriers are required in extra high wind zones and above.
- Rigid air barriers are also required in high wind zones and above for Ministry of Education school properties.

For more information on rigid air barriers refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhwoodproducts.co.nz

4.4 PREPARATION – CAVITY CONSTRUCTION

Cavity Construction

A Shadowclad cavity base closure must be installed at the bottom of all walls and above window heads, this provides vermin proofing to ventilation openings. The holes in the cavity base closure must be kept clear to enable ongoing drainage and ventilation of the cavity.

Cavity Battens

Cavity battens provide an air space between the frame and the sheet and are considered a "packer" when installed in accordance with Acceptable Solution E2/AS1.

The battens must be fixed over the building underlay or a rigid air barrier.

All timber battens must: be nominal 20mm thick (between limits of 18mm and 25mm in thickness); at least the same width as the stud; and minimum H3.1 LOSP treated in accordance with NZS 3640.

Polystyrene battens MUST NOT be used with H3.1 LOSP treated Shadowclad panels, as they may melt in contact with solvents.

Battens must be fixed over the building underlay/rigid air barrier to all studs, as follows.

If studs are at 600mm centres:

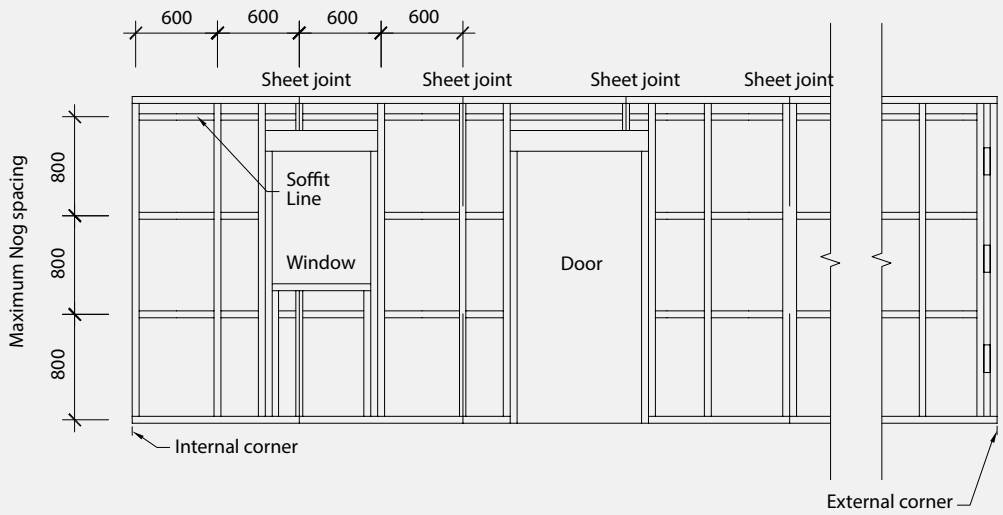
- Battens must be fixed vertically at 300mm centres (i.e. a batten on studs and one in between the two studs fixed to top and bottom plates and nogs)
- Battens fixed between studs are to restrain the building underlay and insulation from bulging into the drained cavity
- The Shadowclad must not be fixed to these cavity battens where there is no framing behind them

If studs are at 400mm centres battens may be fixed on studs only.

Horizontal battens must be used at the top of the wall to block the top of the cavity from venting into the roof space.

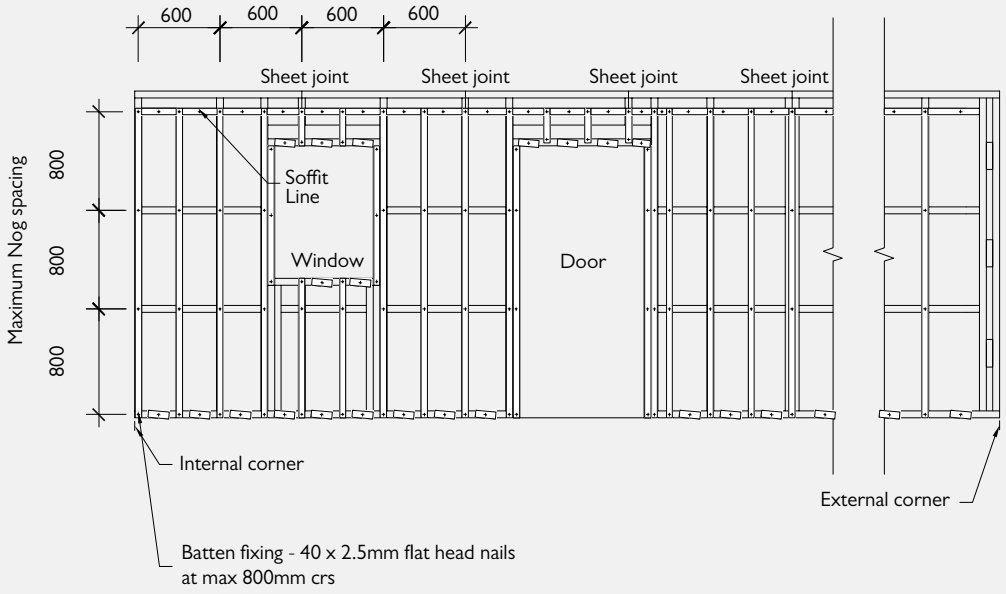
Cavity spacers (i.e. short pieces of cavity batten) may be used to support the bottom sheet edge (or provide intermediate support where required eg above window openings) but must allow water drainage to the outside. The cavity spacers must be fixed at a 5° minimum slope with a 50mm minimum air gap at either side.

SC001: Typical Framing Setout (without Battens)



Note: Single spans of Shadowclad® must not exceed 600 mm (e.g. Below windows or on balustrades)

SC002: Typical Framing Setout (with Battens)



4.5 SHEET LAYOUT

A sheet layout should form part of architectural drawings and be used from the basis of stud/framing layout

- Sheet edges must be supported by the framing
- Sheets are designed to be vertically fixed. **Do not fix sheets horizontally**
- When laying up on to framing, start at framing corners and work across the wall
- All treated Shadowclad panels are envelope preservative treated. Where sheets are cut, edges **must** be coated with a brush on timber preservative such as Holdfast® Metalex® Clear
- Cut edges must be placed at the top of the sheet to avoid rain drips soaking in to cut end grains
- Priming the bottom edges and the back (rear) of the sheets to a height of 150mm is required
  - Shadowclad Ultra sheets are coated on the rear to a height of 150mm (min.) to meet this requirement

4.6 FIXINGS – FASTENER DURABILITY

Table 7 Fastener Durability for Shadowclad®

Finish	Treatment	Exposure Zone (refer to section 4 of NZS 3604)	Material Required
Shadowclad Natural/Ultra	H3.1 LOSP	Zones B & C	Minimum hot dipped galvanised or better
		Zone D (sea spray)	Stainless Steel
Shadowclad Ultra	H3.2 CCA	All Zones	Stainless Steel

4.7 FIXINGS – FASTENER SIZE & LAYOUT

Table 8 Fastener Lengths for Shadowclad®

	Minimum Fastener Length and size (Cavity Fix)
Nails in Timber	60 x 2.8mm
Screws in Timber	8 g x 65mm

Shadowclad must be nailed or screwed to timber as per below:

- Use flat head (full round head) nails or rose head nails with timber framing. Rose head nails should be considered where a more decorative fastener is desired.
- Standard fixing pattern: fasten sheet edges at 150mm centres and within the panel on all supports at 300mm centres
- Do not fix to battens that are not installed over studs as the nails will puncture the building wrap
- Fasten no closer than 7mm to sheet edges except on edge with top lap (weather groove lap), **do not nail through top lap.**
- Fasten shiplap joints independently to ensure natural sheet expansion is not restricted
- When using a rigid air barrier the Shadowclad fastener lengths should be increased by the thickness of the panel to ensure required fastener pull out loadings are achieved
- Drive nails & screws flush
- Do not nail through the grooves in Shadowclad Groove panels

Power Driven Fastening

- Best practice is to hand drive nails as better control of nail depth is achieved
- Paslode Impulse Nailers may be used to fire power driven nails. Refer to Paslode for suitable fasteners as per the minimum lengths stated in table 8
- Do not overdrive nails into the sheet

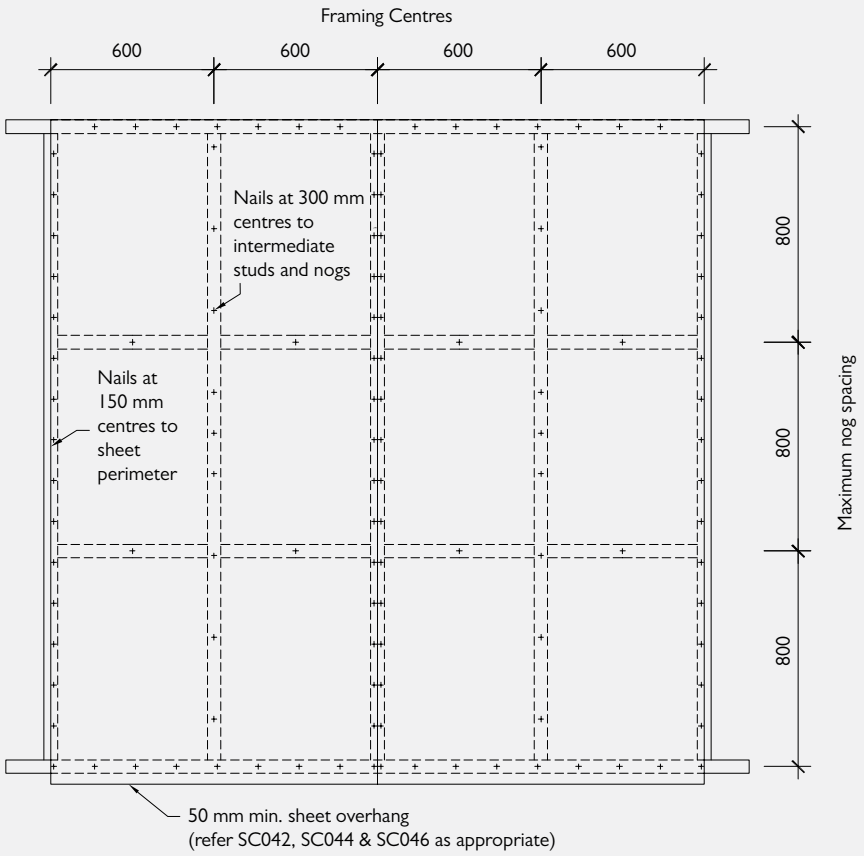
4.8 SHADOWCLAD KEY INSTALLATION AND DESIGN POINTS

The following tasks are provided to installers to point out key installation and design factors when used as an exterior cladding. These do no detract from the requirements to read and understand this literature as a whole.

Task	Tick when checked
Prior to Specification and Installation	
Read the Shadowclad Specification and Installation Guide in its entirety	☐
Framing Plan	
Framing setout drawings to suit Shadowclad fixing and installation guidelines	☐
Sheet Cuts	
Coat all sheet cuts with a preservative timber treatment such as Holdfast® Metalex® Clear	☐
After applying Holdfast® Metalex® Clear, apply the surface coating (e.g. paint or stain) to cut edges	☐
Place uncut edge to bottom	☐
Fastener Material Type	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones and with H3.2 CCA treated Shadowclad Ultra)	☐
Sheet Fastener Pattern	
Around sheet edge – maximum 150mm centre spacing	☐
Within sheet body – maximum 300mm centre spacing	☐
Horizontal Sheet Joints	
Minimum 9mm separation gap between sheets above all Horizontal Z flashings	☐
Prime the bottom of the sheet edge and 150mm up the back (rear) of the sheets	☐
50 mm strip of neutral cure silicon sealant or stop ends at all Z flashing terminations excluding terminations at Shadowclad™ metal corner flashings	☐
Back flashings or 150 mm overlap to all flashing butt joints	☐
Expansion Gaps Between Sheets (Vertical Sheet Joints)	
Texture Profile Sheets - 2mm gap between vertical edges of sheets	☐
Groove Profile Sheets - 9mm gap (i.e. full groove space) between vertical edges of sheets	☐
Note: Expansion gaps required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
Ground Clearances	
Paved/ Sealed Ground - minimum 100mm distance from the ground to sheet bottom	☐
Broken Ground - minimum 175mm distance from the ground to sheet bottom	☐
Prime the bottom of the sheet 150mm up the back (rear) of the sheet	☐

Refer to the current Shadowclad Specification and Installation Guide for full installation specifications and suggested details

SC003: Shadowclad® Fastener Layout



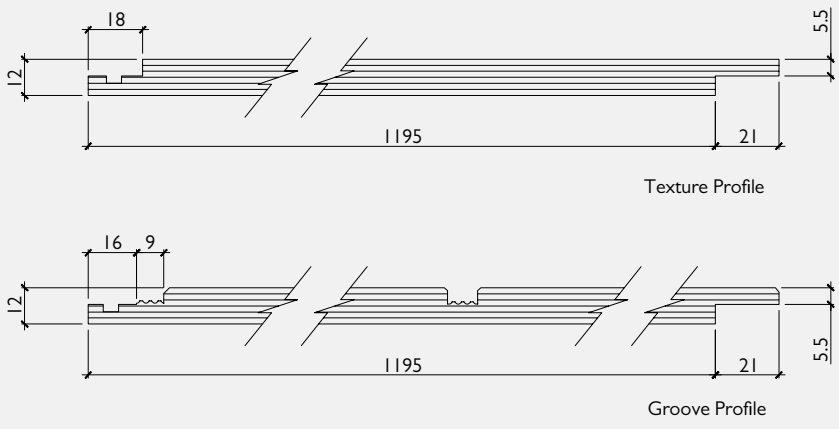
4.9 VERTICAL SHEET JOINTS

Shadowclad sheets have a built-in shiplap joint and weather groove on the long edges of all sheets.

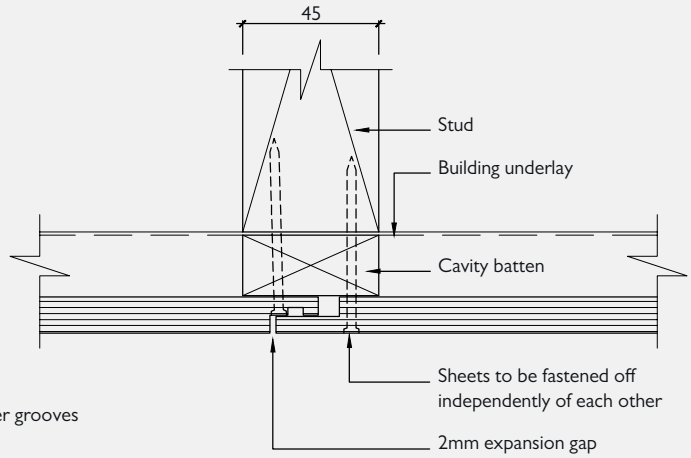
When installing Shadowclad Groove profile sheets, use a 9mm temporary spacer in the groove alongside shiplap joint to establish correct expansion gap.

Treat all cut edges with a suitable brush on preservative treatment such as Holdfast® Metalex® Clear.

SC004: Shadowclad® Texture and Groove Sheet Dimensions



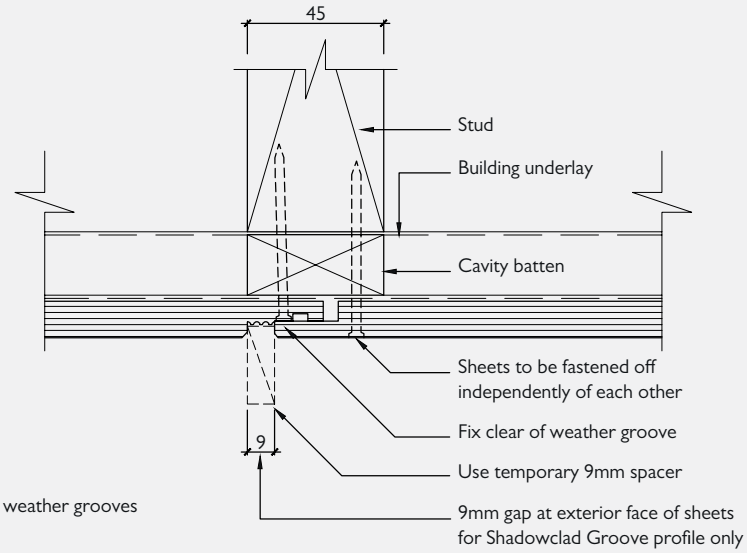
SC006: Shadowclad® Texture Vertical Joint (Cavity)



Note:

1. Do not nail through weather grooves

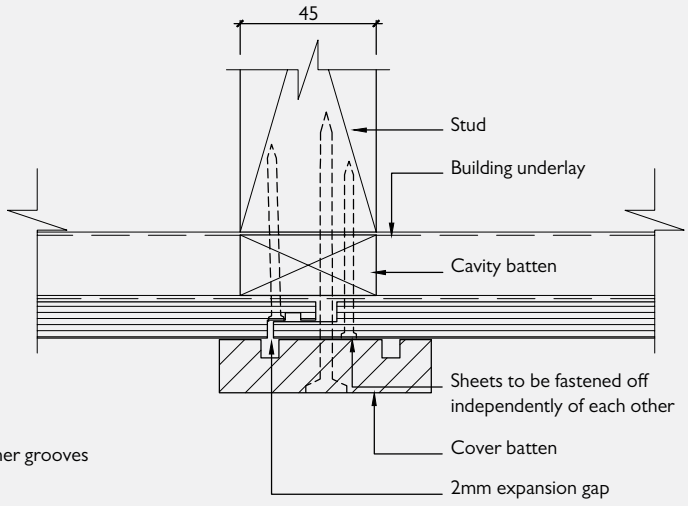
SC008: Shadowclad® Groove Vertical Joint (Cavity)



Note:

1. Do not nail through weather grooves

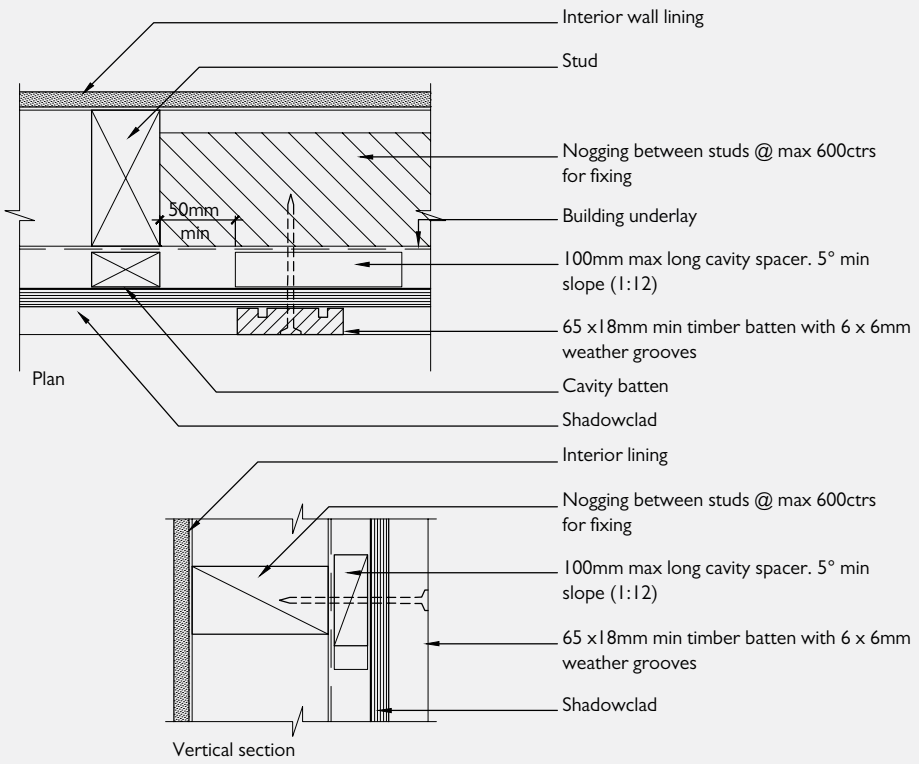
SC010: Shadowclad® Vertical Joint with Optional Cover Batten (Cavity)



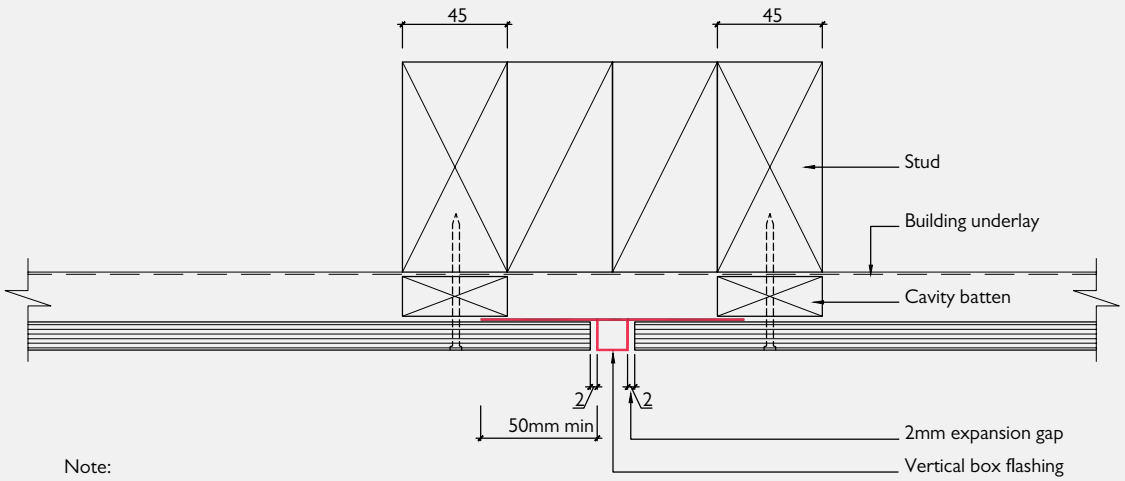
Note:

1. Do not nail through weather grooves

SC012: Shadowclad® Nogging for Vertical Cover Batten Between Studs (Cavity)



SC014: Shadowclad® Vertical Joint with Top Hat Flashing (Cavity)



Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

4.10 HORIZONTAL SHEET JOINTS

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

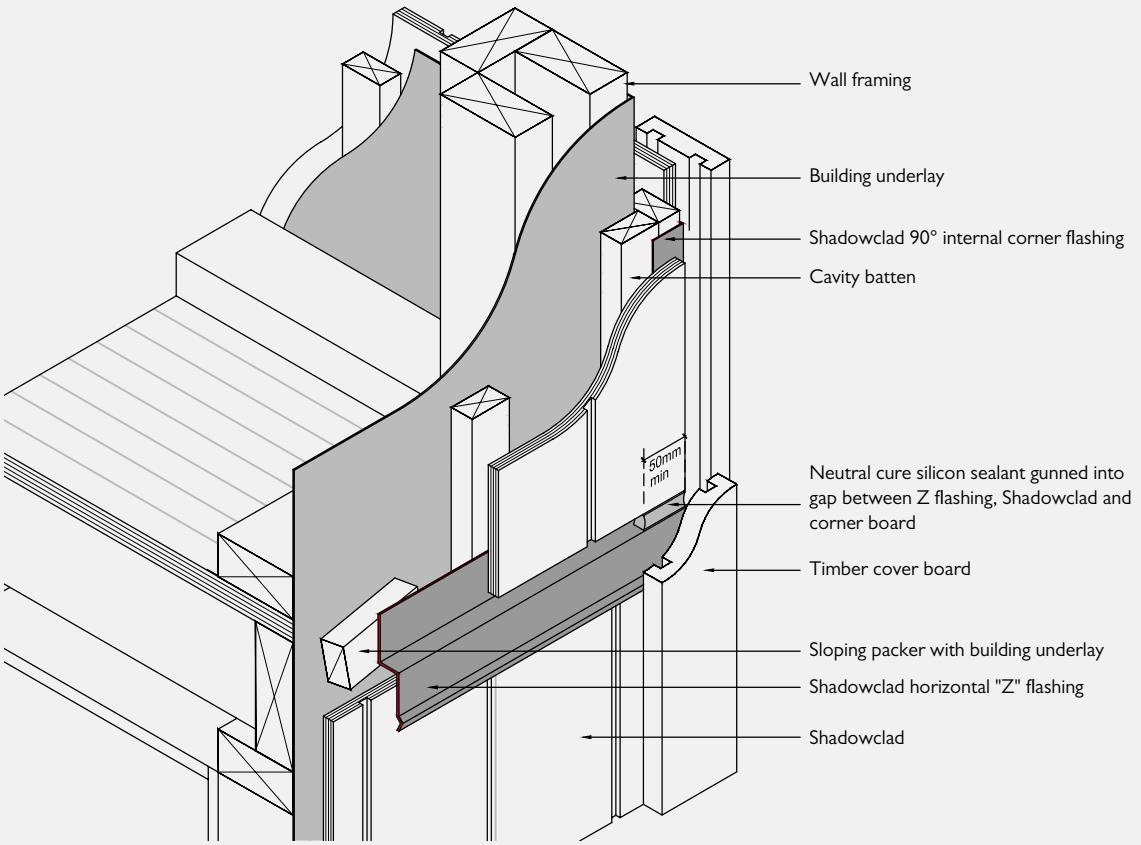
A Shadowclad™ horizontal 'Z' flashing should be used for horizontal sheet joints.

Acceptable Solution E2/AS1 requires drained cavities to be limited to a height of two storeys.

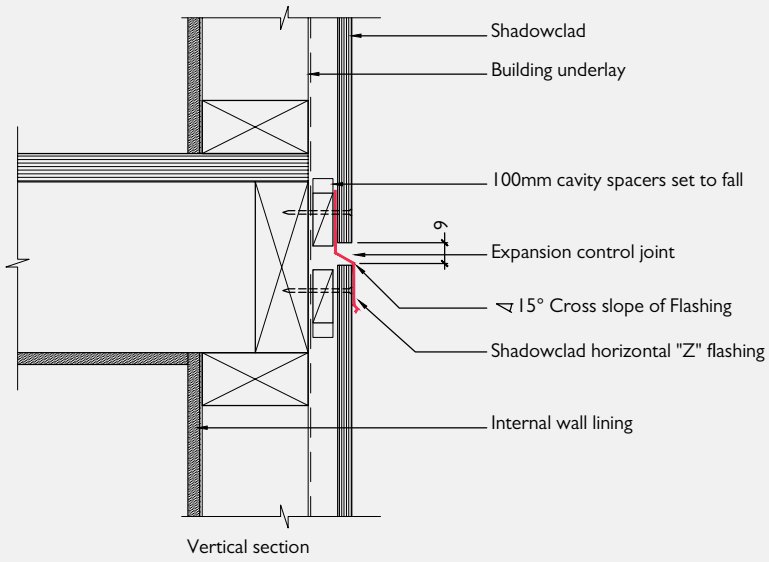
If aluminium 'Z' flashings are being used, all butt joints must include proprietary back flashings. Stainless steel flashings should be lapped by a minimum 150 mm at joins.

A 50 mm strip of neutral cure silicon (refer General Silicon Sealing of Horizontal 'Z' Flashings detail below) or stop ends (as applicable) required at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings.

Shadowclad® General Silicon Sealing of Horizontal 'Z' Flashings



SC016: Shadowclad® Mid Floor Horizontal Joint (Cavity)

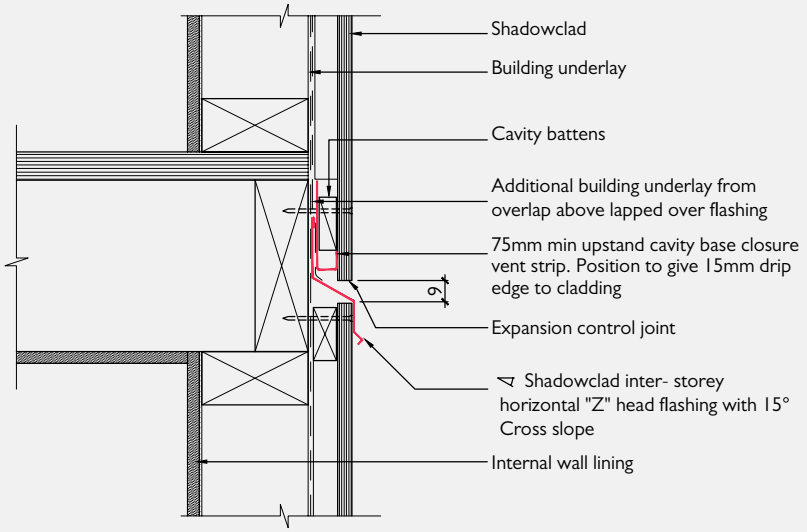


Vertical section

Note:

1. 50mm strip of neutral cure silicon sealant must be provided at the termination point of all Z flashings at windows, corner boxes, etc.
2. Detail is only suitable for drained cavities up to two storeys or 7m in height. For drained cavities over two storeys or 7 m in height refer to detail SC018 Horizontal Joint - Non Continuous (Cavity)
3. Back flashings or 150mm overlap required at all horizontal flashing butt joints
4. Treat all Shadowclad cut edges with Holdfast® Metalex® Clear

SC018: Shadowclad® Mid Floor Horizontal Joint – Non Continuous (Cavity)



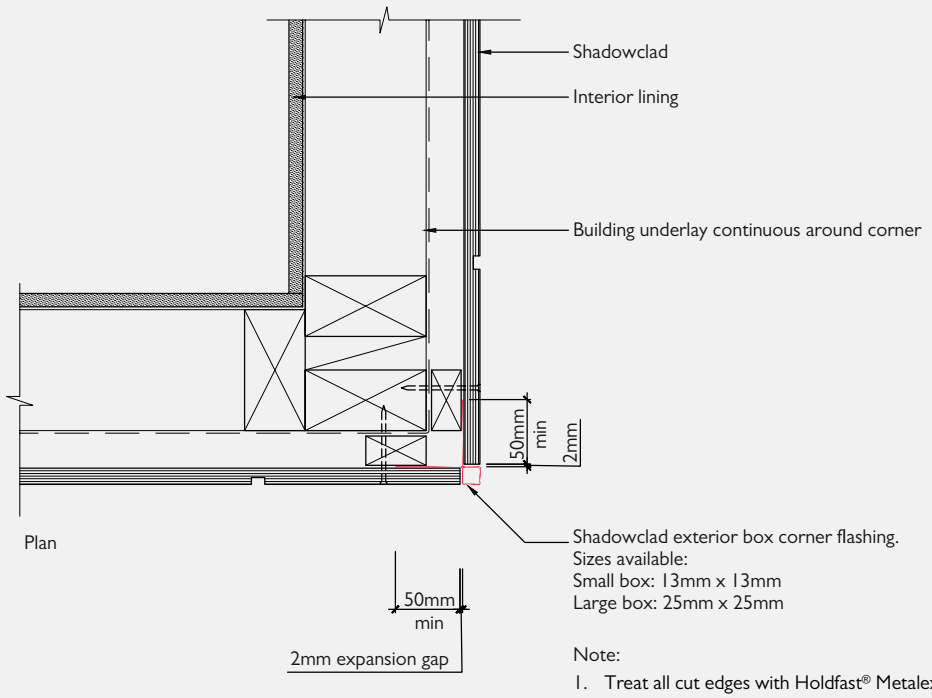
Vertical section

Note:

1. Stop ends must be provided at the termination point of all inter-storey Z flashings.
2. Detail SC016 Mid Floor Horizontal Joint (Cavity) may be used for continuous cavity up to two storey or 7 m in height
3. Back flashings or 150mm overlap required at all horizontal flashing butt joints.
4. Treat all Shadowclad cut edges with Holdfast® Metalex® Clear

4.11 EXTERNAL CORNERS

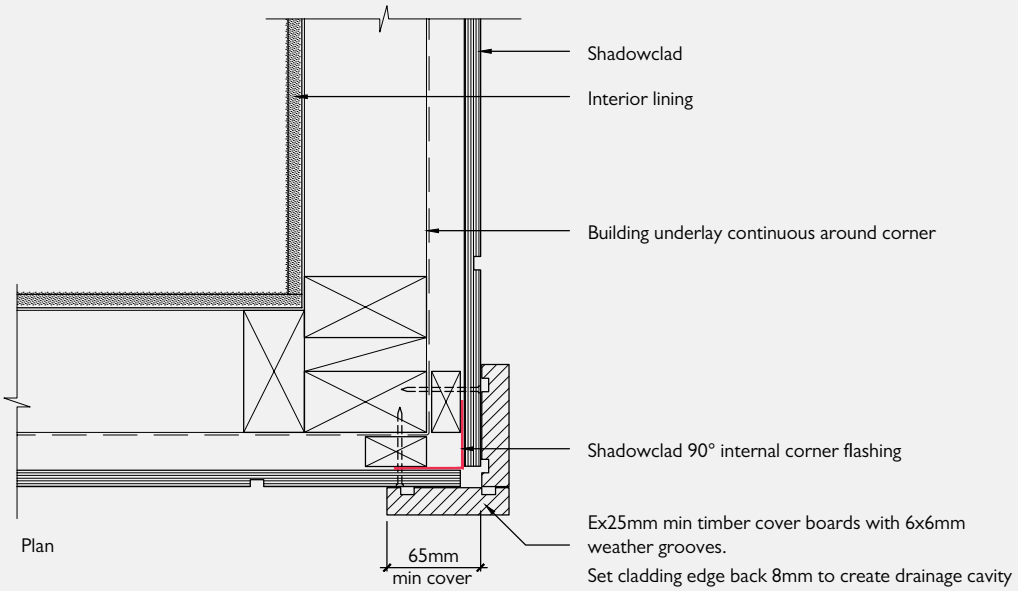
SC020: Shadowclad® External Corner with External Box Flashing (Cavity)



Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

SC022: Shadowclad® External Corner with Cover Boards (Cavity)

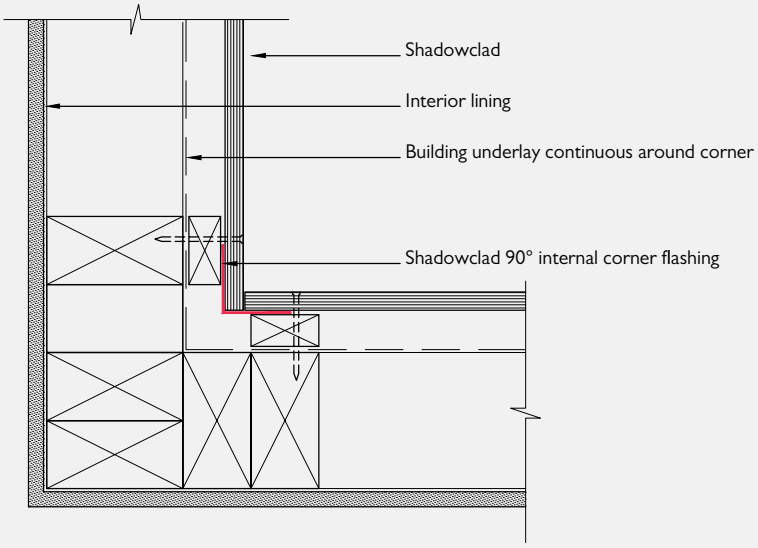


Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. 50mm strip of neutral cure silicon sealant must be provided at the termination point of all Z flashings at windows, corner boxes, etc.

4.12 INTERNAL CORNERS

SC024: Shadowclad® Internal Corner with 90° Flashing (Cavity)

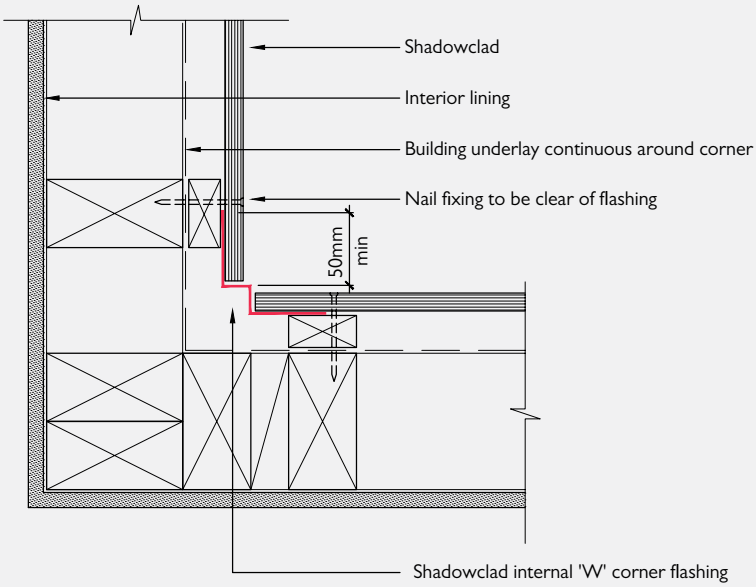


Plan

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

SC026: Shadowclad® Internal Corner with W Flashing (Cavity)



Plan

Sizes available:
Small 'W': 13mm x 13mm
Large 'W': 25mm x 25mm

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

4.13 SHADOWCLAD™ FLASHING JUNCTION POINTS

Flashings should have expansion joints where necessary to provide adequate allowance for thermal expansion as set out below.

- Expansion joints to be provided for joined flashings with a combined length exceeding 8 metres
- Where both ends of a flashing are constrained, allowance should be made for expansion

Cavity Base Closure

Fix Shadowclad cavity base closures to bottom plates through the upstand with 40 x 2.5mm, hot dipped galvanised or stainless steel (as appropriate) flat head nails at 300mm centres.

The cavity base closure should be positioned to allow a minimum drip edge to the wall cladding of 15mm at the base of walls, and 15mm above window head flashings.

Internal and External Flashings

Internal and external angles and 'Z' flashings can be nominally fixed with hot dipped galvanised or stainless steel (as applicable) flat head nails and then permanently fixed with the Shadowclad fasteners penetrating the flashing wings/upstands.

Horizontal 'Z' Flashings

Horizontal aluminium 'Z' flashings should be butted together with a back flashing to create a weathertight joint.

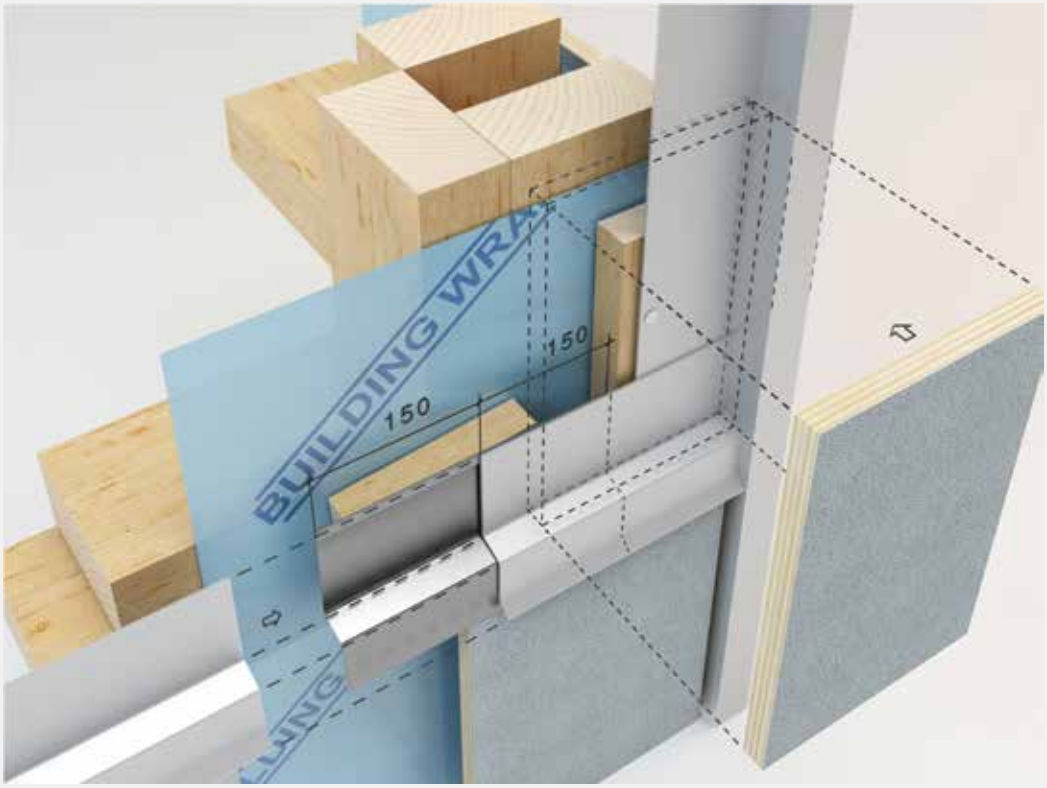
Stainless steel back flashings should overlap by a minimum of 150 mm at joins to create weathertight joints where horizontal flashings meet.

'Z' Flashings Terminations

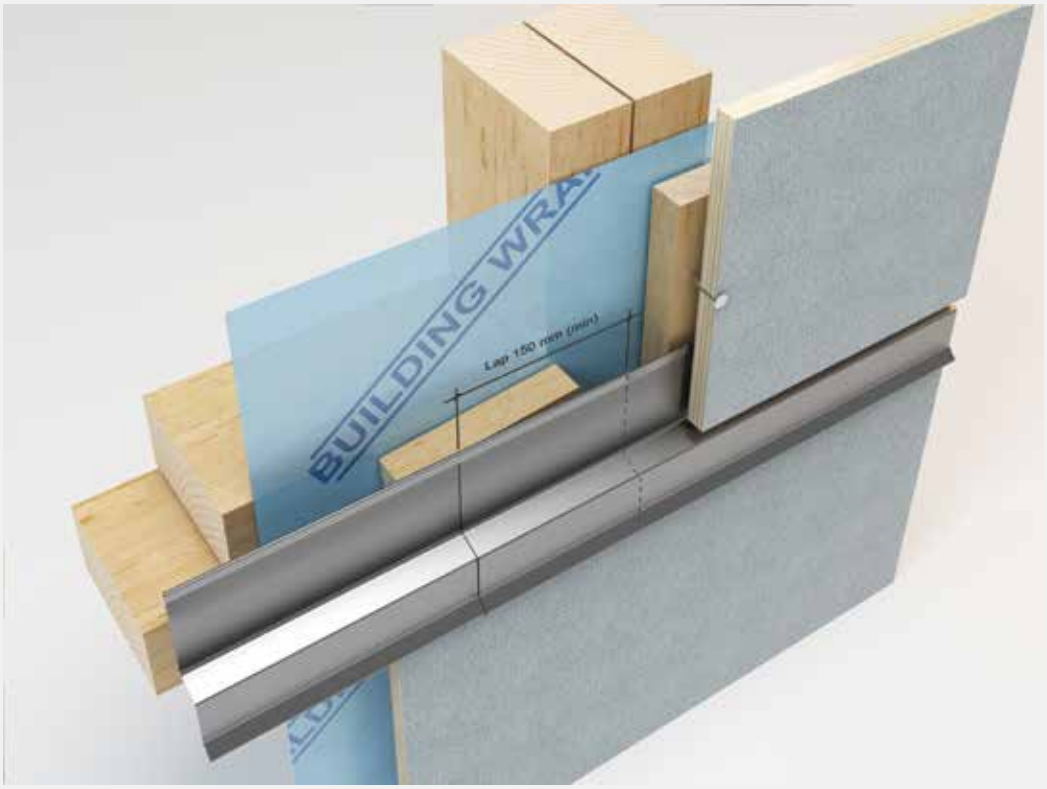
Where inter-storey 'Z' flashings terminate stop ends must be installed.

A 50 mm strip of neutral cure silicon (refer General Silicon Sealing of Horizontal 'Z' Flashings detail page 21) or stop ends (as applicable) required at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings.

Shadowclad™ Aluminium Flashing Junctions and Connections (Cavity)



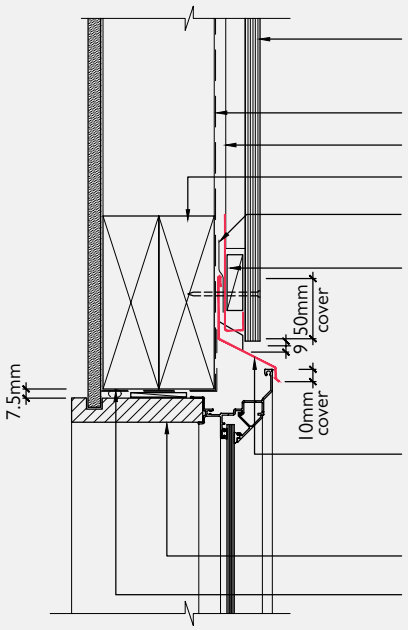
Shadowclad® Stainless Steel 'Z' Flashing Joins (Cavity)



4.14 WINDOW PENETRATIONS

Window joinery flashings (ie head and sill flashings) should be sourced from the joinery fabricator to meet the requirements of Acceptable Solution E2/ASI or an Alternative Solution such as the Window Association of New Zealand Window Installation System (WANZ WIS) which can be downloaded at www.wanz.org.nz.

SC028: Shadowclad® Window Head Detail (Cavity)

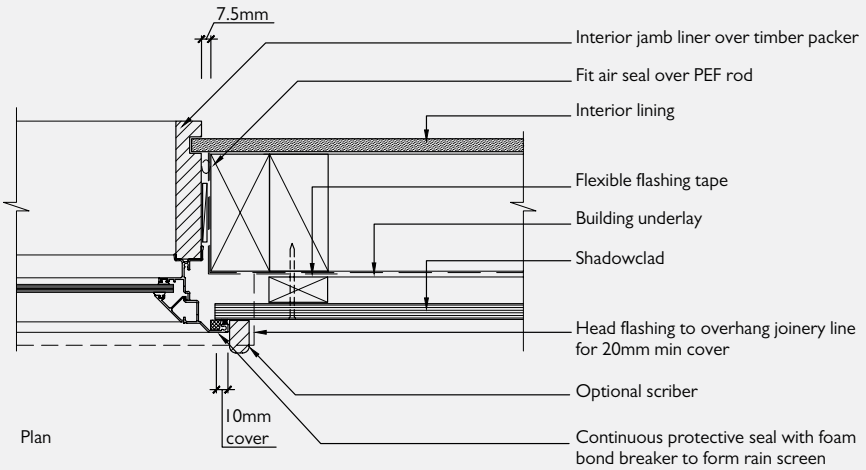


- Shadowclad
- Building underlay
- Cavity battens
- Lintel
- Flexible flashing tape strip placed over building underlay and flashing joint
- Cavity spacers with 50mm min air gap on both sides. 5 degree min slope (1:12). Position to allow Shadowclad fixing at 150mm centres 75mm min upstand cavity base closure vent strip. Position to give 15mm drip edge to cladding
- Head flashing with 15 degree slope. 15mm high stop ends within cavity
  Sealant between head flashing & window flange in very high wind zone & above
- Interior jamb liner over timber packer
- Fit air seal over PEF

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. Stop ends to head flashing terminations

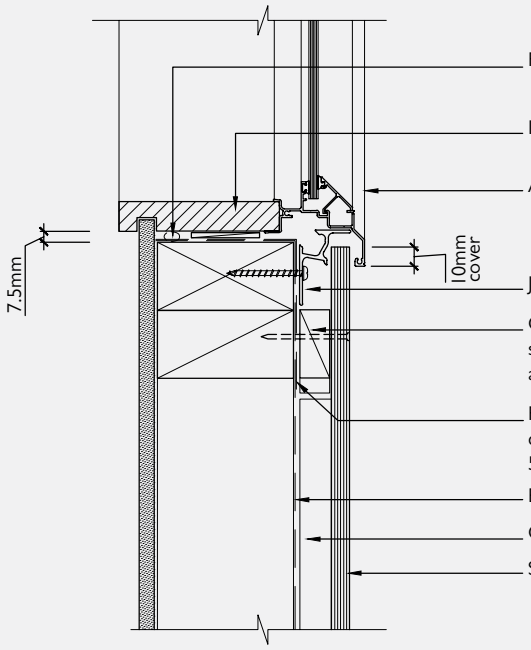
SC030: Shadowclad® Jamb Detail (Cavity)



Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. 50mm strip of neutral cure silicon sealant must be provided at the termination point of all Z flashings at windows, corner boxes, etc.

SC032: Shadowclad® Window Sill Detail (Cavity)



Fit air seal over PEF rod

Interior sill with timber packer

Aluminium joinery sill

Joinery support bar

Cavity spacers with 50mm min air gap on both sides. 5 degree min slope (1:12). Position to allow Shadowclad fixing at 150mm centres

Flexible flashing tape over building underlay continuous along sill, 100mm min up jambs & 50mm lap over vertical face

Building underlay

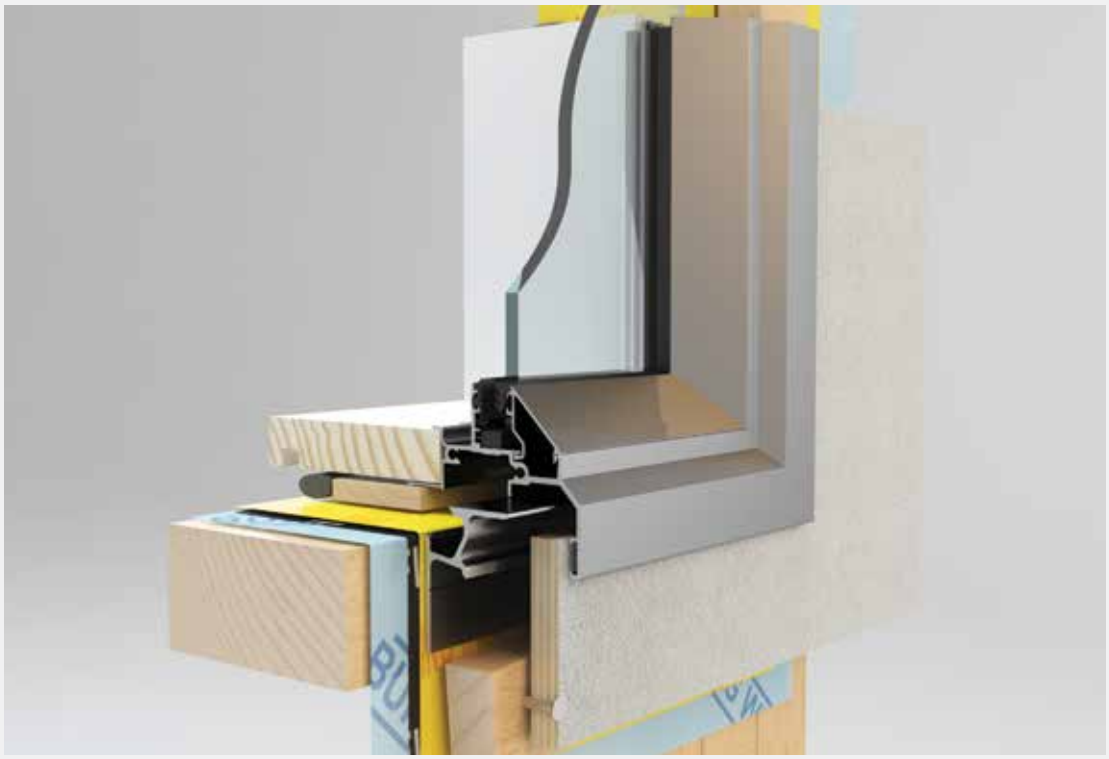
Cavity battens

Shadowclad

Vertical section

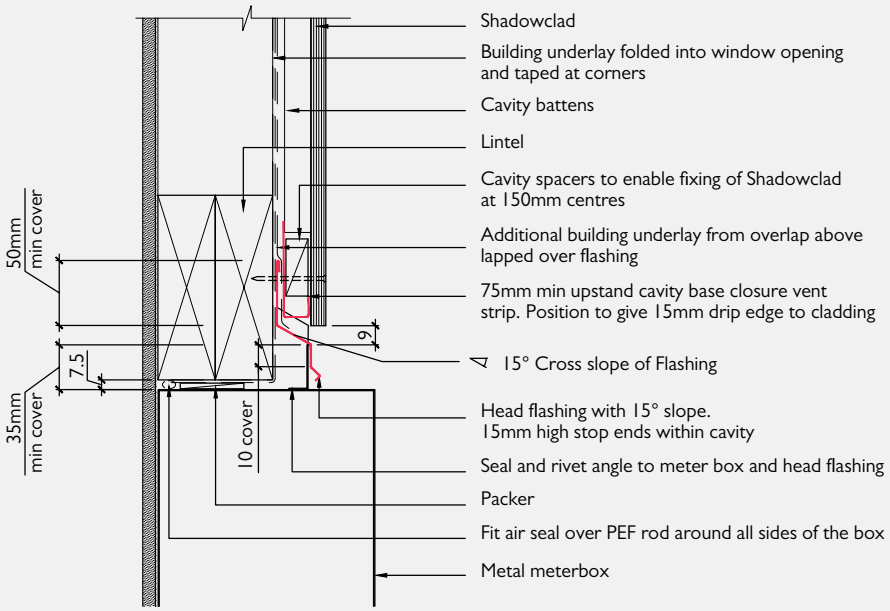
Note:

1. Treat all cut edges with Holdfast® Metalex® Clear



4.15 WALL PENETRATIONS

SC034A: Shadowclad® Meterbox Vertical Cross Section (Cavity)

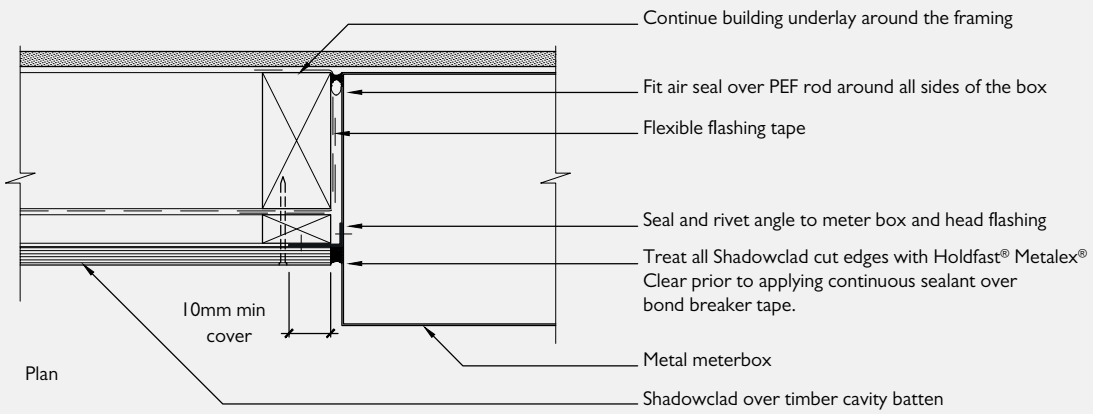


Vertical section

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

SC034B: Shadowclad® Meterbox Horizontal Cross Section (Cavity)

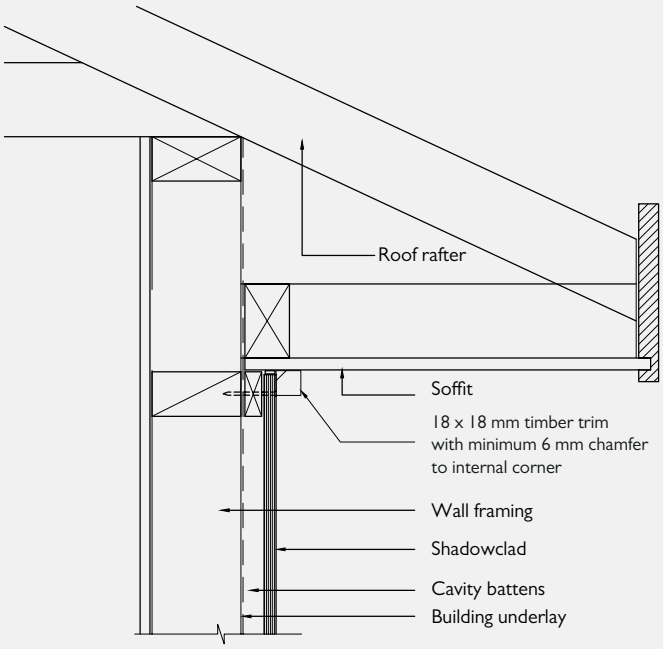


Plan

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. 50 mm strip of neutral cure silicon sealant must be provided at termination points of all Z flashings at meter boxes

SC036: Shadowclad® Soffit Detail (Cavity)

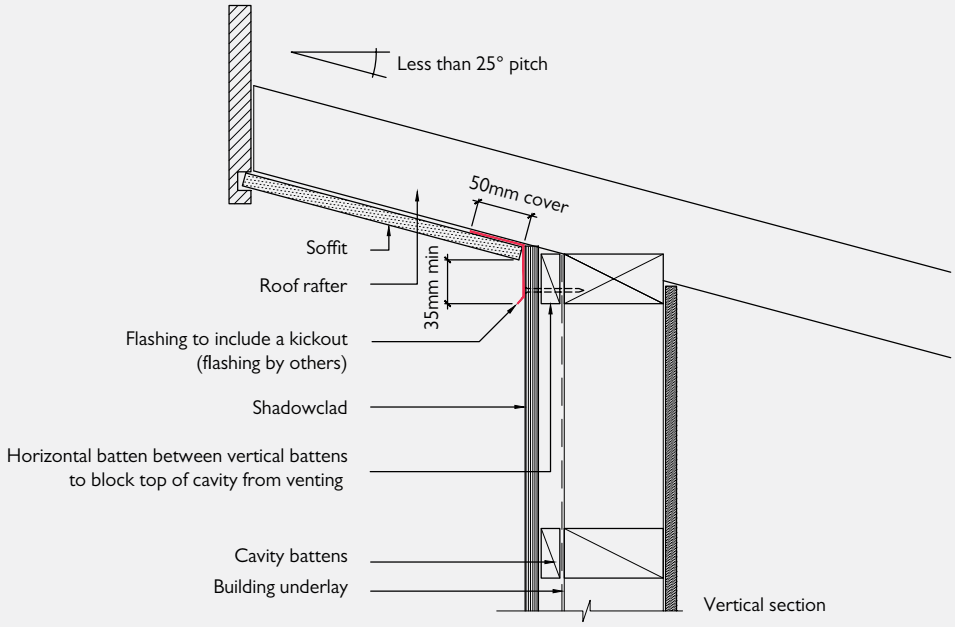


Vertical section

Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

SC036A: Shadowclad® Alternative Soffit Detail (Cavity)

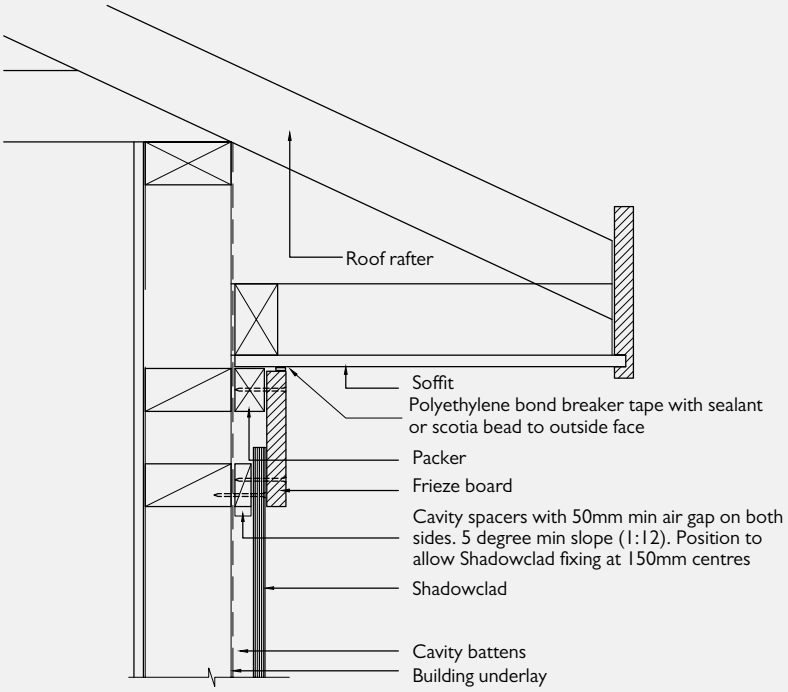


Vertical section

Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

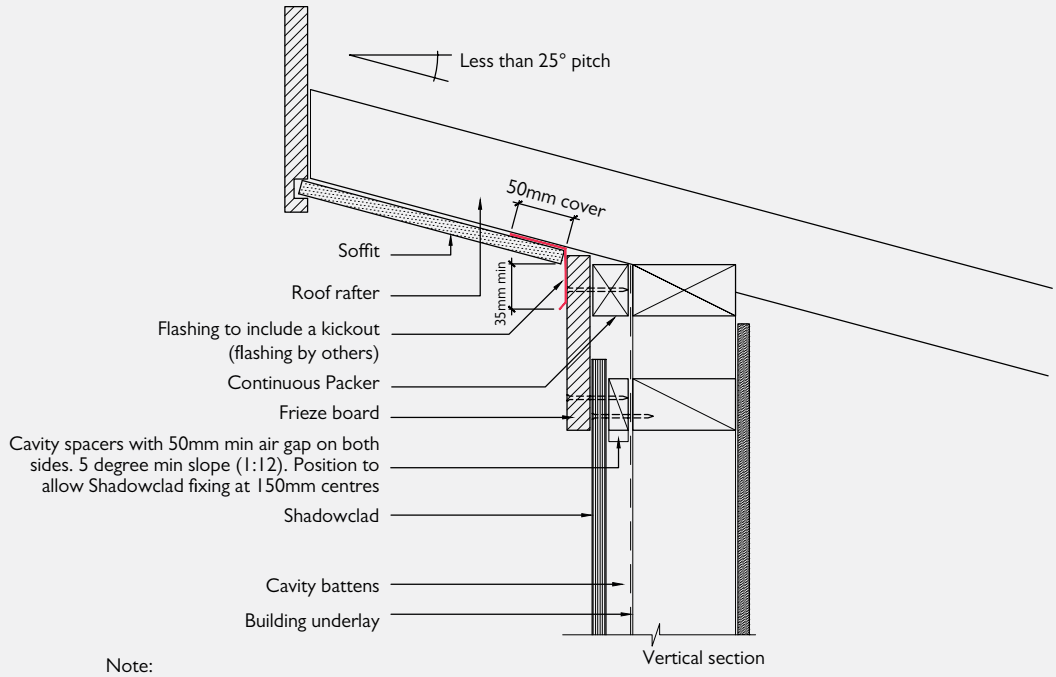
SC038: Shadowclad® Soffit Alternative Detail (Cavity)



Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

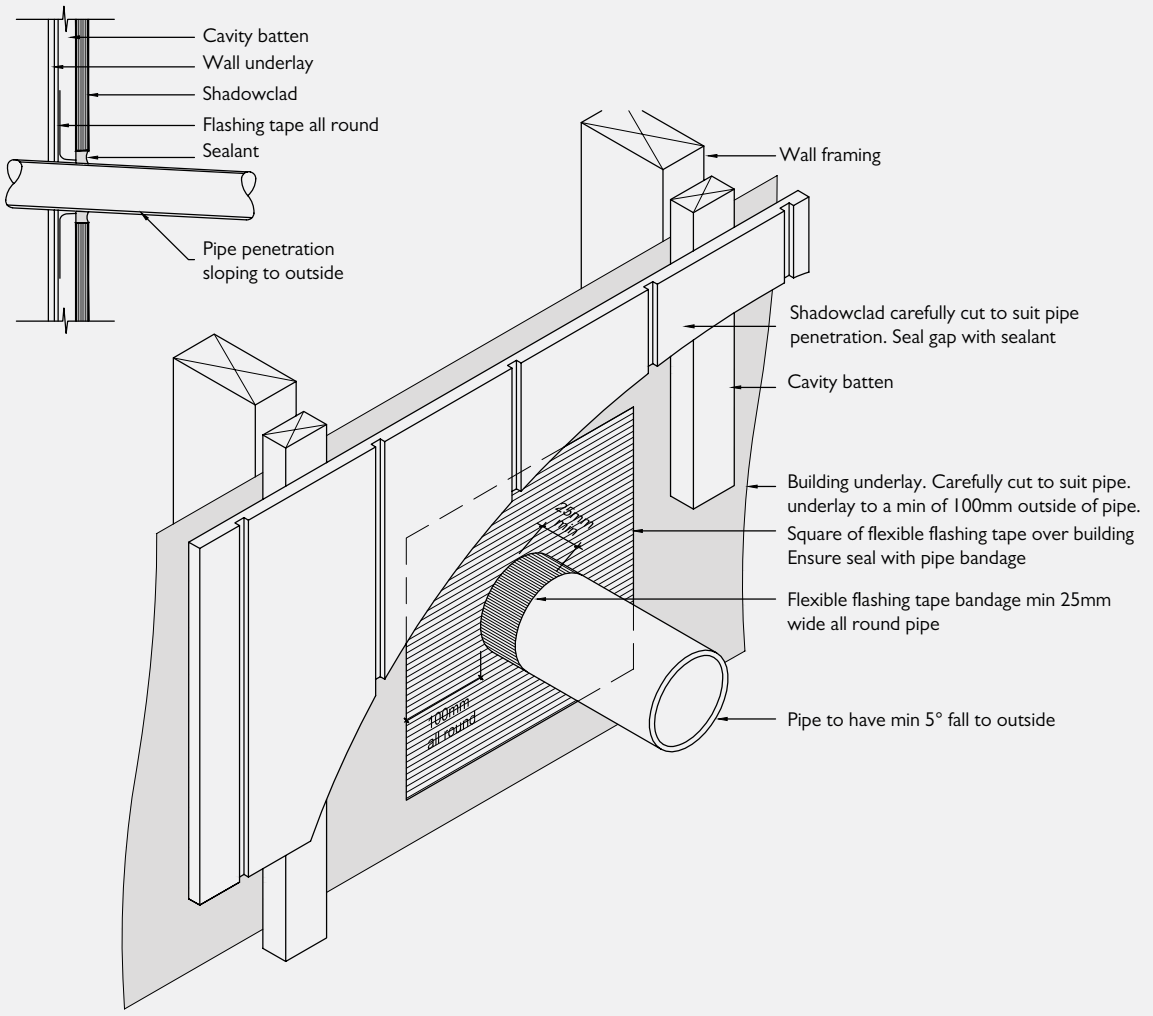
SC038A: Shadowclad® Alternative Soffit Detail (Cavity)



Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

SC040: Shadowclad® Pipe Penetration (Cavity)



4.16 SHEET CLEARANCES

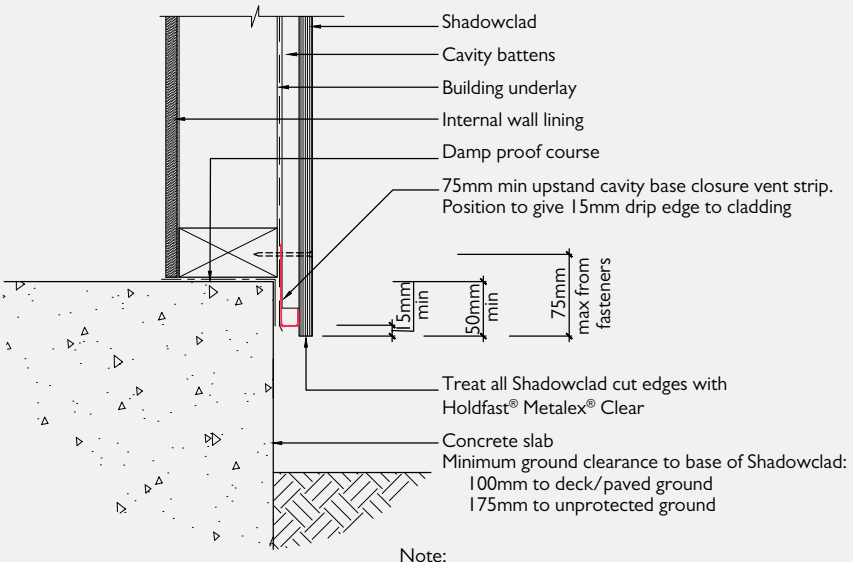
Ground Clearances

Shadowclad must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604 and E2 - External Moisture. Maximum distance from the bottom of the sheet to the fixing shall not exceed 75mm.

The bottom edge of the Shadowclad sheet must be a minimum of 50mm above decks and verandahs, 100mm above paved ground and a minimum of 175mm above unprotected ground.

For garage door openings, refer Paragraph 9 "Openings to garages" in Acceptable Solution E2/AS1.

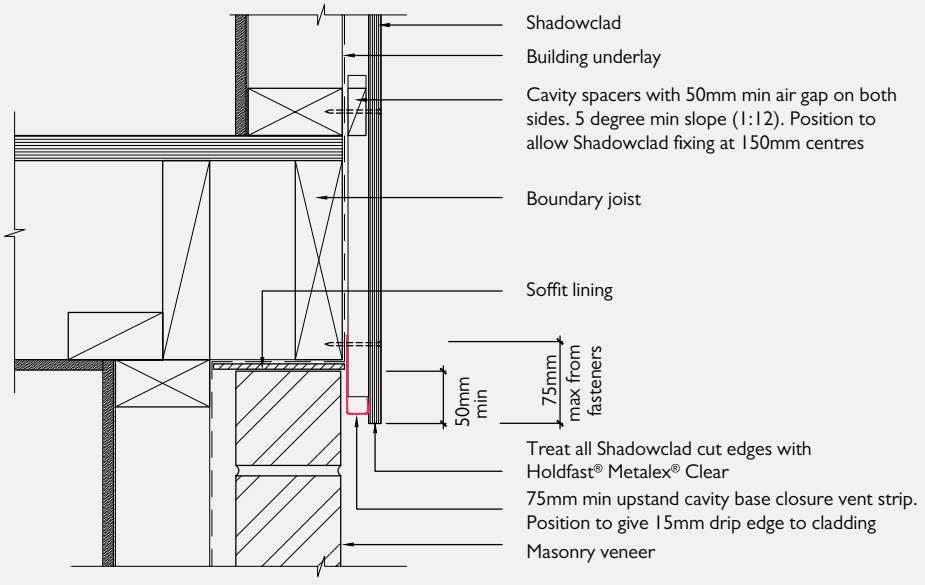
SC042: Shadowclad® Overhangs and Ground Clearances (Cavity)



Vertical section

Note:
1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

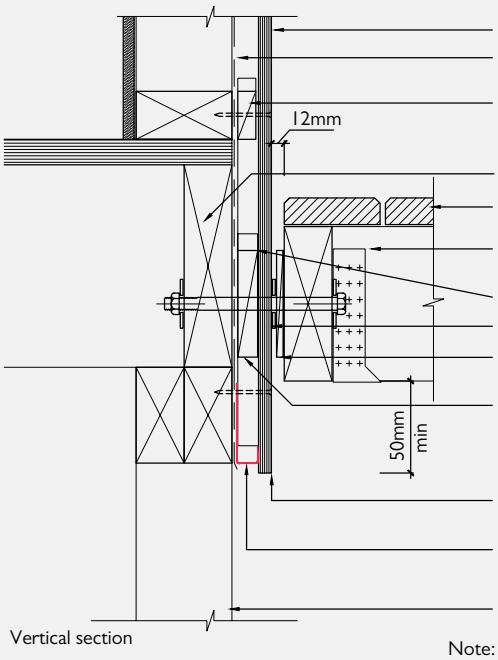
SC044: Shadowclad® Upper Storey to Masonry Lower Storey (Cavity)



Vertical section

Note:
1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

SC046: Shadowclad® Timber Ground Floor to Non-Cantilevered Deck (Cavity)



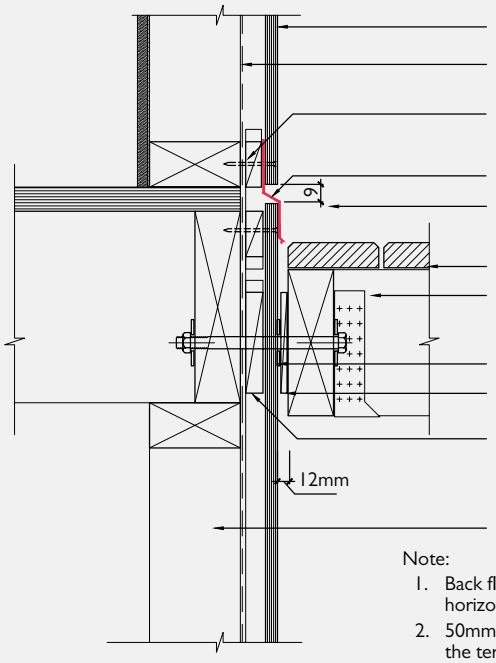
Vertical section

- Shadowclad
- Building underlay
- Cavity spacers with 50mm min air gap on both sides. 5 degree min slope (1:12). Position to allow Shadowclad fixing at 150mm centres
- Boundary joist
- Decking
- Deck joists attached to stringer with joist hangers. Refer NZS3604 for fixing details. Shadowclad sealed prior to fixing packer
- Packer with top edge on a slope per cavity battens
- 50 x 3mm thick EPDM washer
- 12mm thick by 150mm long H3.2 CCA treated solid timber packer at fixings
- Timber packer behind Shadowclad at bolt
- Treat all Shadowclad cut edges with Holdfast® Metalex® Clear
- 75mm min upstand cavity base closure vent strip. Position to give 15mm drip edge to cladding
- Jack stud / bearer

Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

SC048: Shadowclad® Mid Floor to Non-Cantilevered Deck (Cavity)



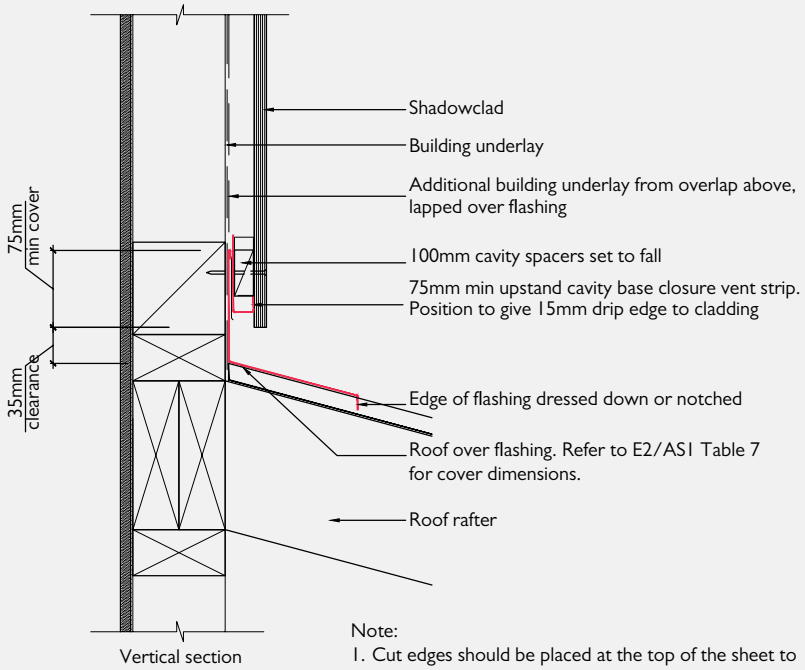
Vertical section

- Shadowclad
- Building underlay
- Cavity spacers with 50mm min air gap on both sides. 5 degree min slope (1:12). Position to allow Shadowclad fixing at 150mm centres
- ◁15° Cross slope of Flashing
- Shadowclad horizontal "Z" head flashing
- Decking
- Deck joists attached to stringer with joist hangers. Refer NZS3604 for fixing details. Shadowclad sealed prior to fixing packer
- 50 x 3mm thick EPDM washer
- 12mm thick by 150mm long H3.2 CCA treated solid timber packer at fixings
- Timber packer behind Shadowclad at bolt Slope top of packer per cavity battens
- Foundation / sub-floor

Note:

1. Back flashing or 150mm overlap required at all horizontal flashing butt joints
2. 50mm strip of neutral cure silicon sealantmust be provided at the termination point of all Z flashings at windows, corner boxes, etc.
3. Treat all cut edges with Holdfast® Metalex® Clear

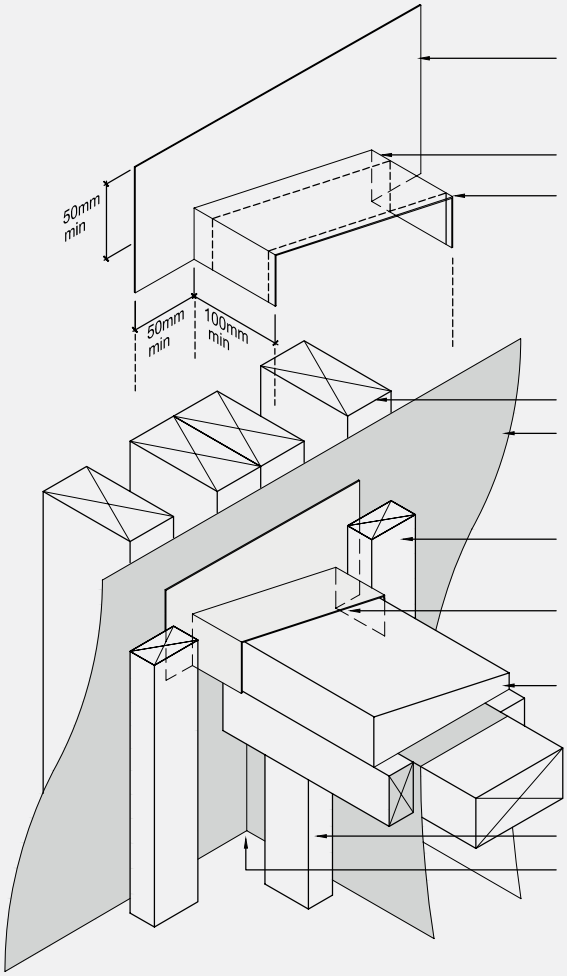
SC050: Shadowclad® Basic Apron Flashing (Cavity)



Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

SC052: Shadowclad® Balustrade to Wall Junction (Cavity)



Metal saddle flashing installed behind the cladding line.

Continuous lines of sealant

Continuous lines of sealant

Wall framing

Building underlay

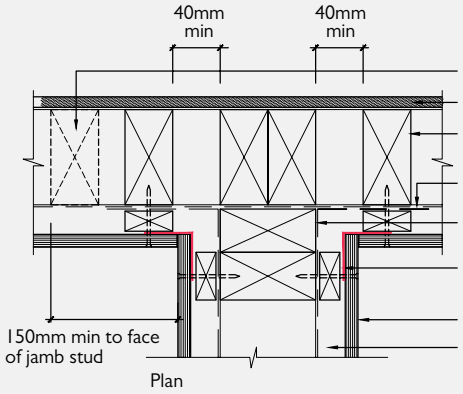
Position cavity batten to form clear channel between sloped timber capping & batten.

Flexible flashing tape dressed up & securely adhered to wall underlay at rear of cavity
Dress 50mm min down vertical face of battens

Sloping packer to extend across cavity with 5° minimum fall to interior side

Cavity batten

Drain channel formed in corner



Plan

Window trimming stud

Wall lining

Wall framing

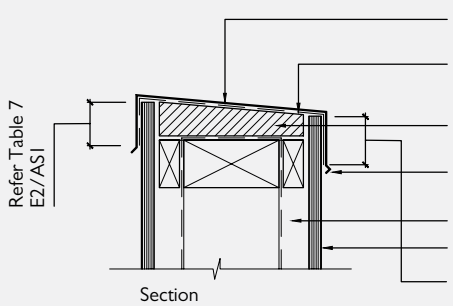
Building underlay

Parapet underlay continuous around corner.

Shadowclad 90° internal corner flashing

Shadowclad

Cavity batten



Section

Metal saddle capping flashing.
5° min slope (1:12) to interior line

Building underlay to provide separationpan between capping & timber

Sloping timber packer extends across cavity both sides

Bird's beak edge where used as ballustrade capping

Cavity batten

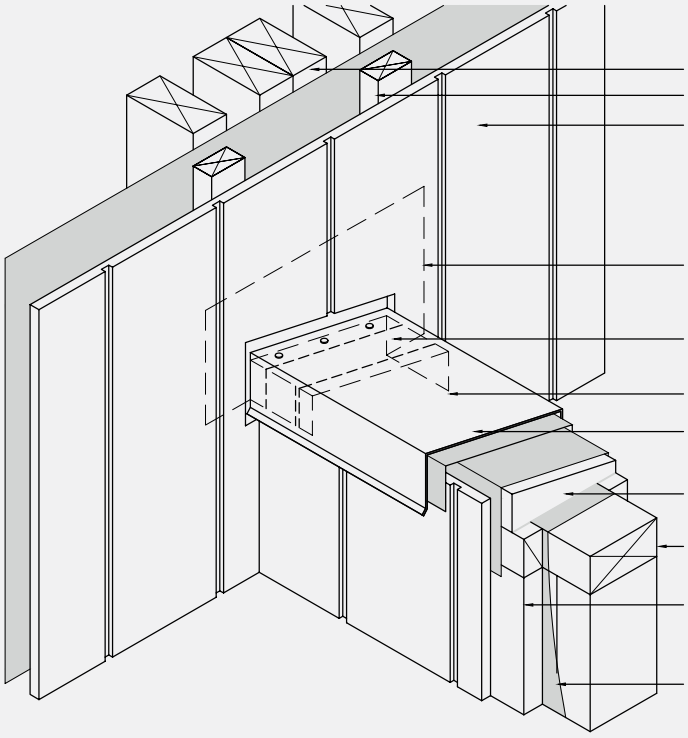
Shadowclad

Refer Table 7 E2/AS1

Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

SC054: Shadowclad® Balustrade to Wall Junction (Cavity)



Wall framing

Cavity batten

Shadowclad

Metal saddle flashing under parapet capping. Refer E2/AS1 Figure 13 for min dimensions. Flexible flashing tape dressed up & adhered to building underlay behind battens

Rivet through sealant & seal capping to saddle flashing across top

Flexible flashing tape to extend min 50mm down face of battens

Parapet flashing with 5° min fall to interior side. Building underlay to provide insulation of metal flashing to timber

Sloping packer with building underlay

Wall framing

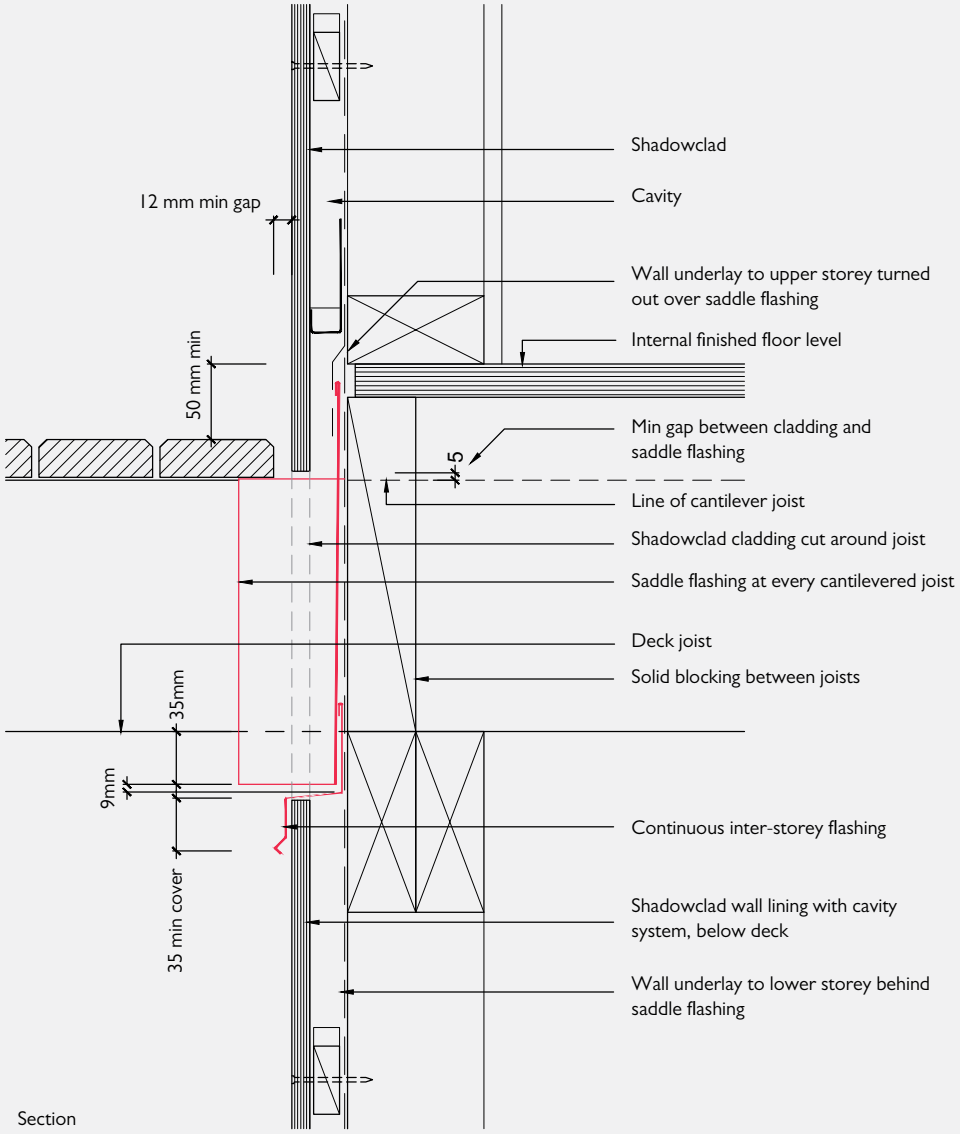
Cavity batten

Building underlay continuous over top of wall framing

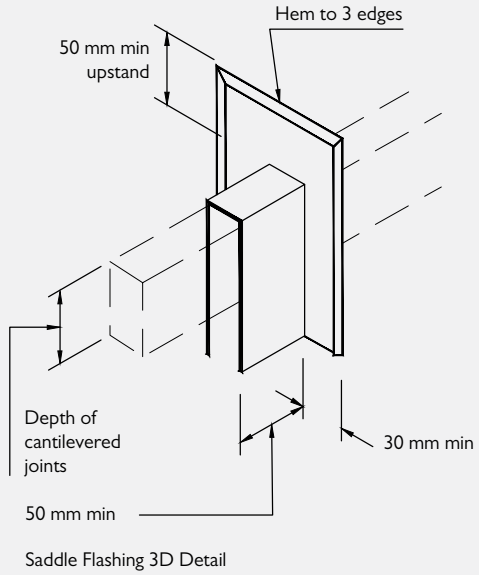
Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

SC056: Shadowclad® Junction with Wall for Cantilevered Deck (Cavity)



Section

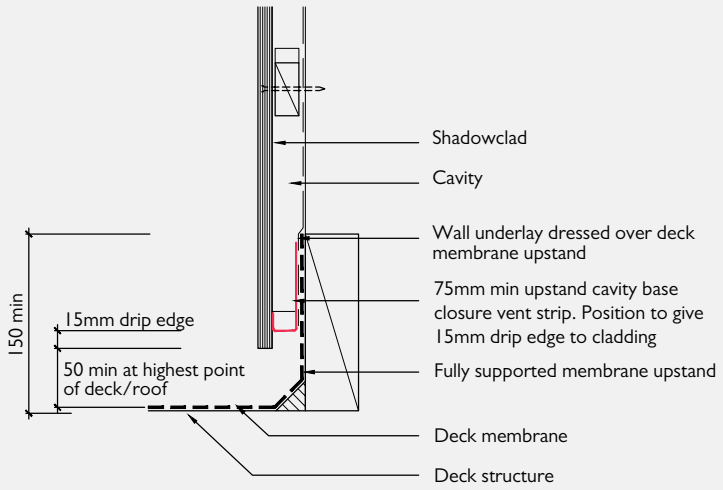


Saddle Flashing 3D Detail

Note:

1. Building wrap at back of cavity shall be taped around joist penetration
2. The back of the saddle flashing shall be positioned behind the cladding
3. Saddle flashing terminates over inter-story flashing
4. Treat all cut edges with Holdfast® Metalex® Clear

SC058: Shadowclad® Detailing for Enclosed Balustrade (Cavity)



Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear

5.0 COATING & APPLICATION – EXTERIOR CLADDING

5.1 SURFACE PREPARATION

- Shadowclad is manufactured, treated and stored in dry conditions at CHH Woodproducts manufacturing facilities. The H3 treatment provides temporary repellence to mould prior to on site coating, however it remains the applicators responsibility to ensure the surface is dry and free from dust and mould prior to coating
- If Shadowclad has been exposed to external weathering for over 3 months wash surfaces with a mild detergent solution to remove any dirt, dust, mould or sea spray prior to coating
- If recoating, remove loose, flaking or unsound coatings and wash walls prior to recoating
- The Shadowclad surface must be dry prior to applying any surface coating

5.2 COATING APPLICATION

- If sheets feel greasy to touch, separate and place in a dry, well ventilated area to allow any residual solvents from the treatment process to flash off prior to applying coatings
- Panels are envelope treated. Sheet cuts **must** have a brush on treatment applied such as Holdfast® Metalex® Clear prior to applying coatings
- Coatings should be applied by brush to ensure adequate coating film build is achieved. Application via roller or spray is not recommended
- Shadowclad Natural panels should be coated within 3 months of installation
- Priming of sheet edges and on the rear of the sheet to a height of 150mm is considered good practice, and required at the base of all sheets
  - Shadowclad Ultra sheets are coated on the rear to a height of 150mm (min.) to meet this requirement
- A minimum total coating system film build of 90 microns is recommended when painting or using film forming stains, including a minimum 30 micron thickness per coat
- For detailed advice on surface preparation, coating product suitability and general coating practice always refer to the coating manufacturer prior to application

5.3 COATING SELECTION

The following coating information should be treated as a generic guide to coating systems typically used with Shadowclad exterior cladding. The selection, application and maintenance of coatings is the responsibility of building owners and the professionals that they engage. For advice on specific coating products and their suitability for use on Shadowclad always refer to the coating manufacturer.

It is important to note regardless of the cladding materials selected there will always be a level of coating maintenance required to ensure the cladding material is sufficiently protected from the elements and maintains the desired appearance.

Paints & Film Forming Stains

Three coats (1 undercoat, 2 top coats) of a good quality, 100% acrylic paint system with a light reflectance value (LRV) of 50% or greater (i.e. light colours) which is regularly maintained will provide the highest level of protection and durability for Shadowclad and is likely to require the least amount of coating maintenance over the life of the cladding.

Dark colours (LRV of below 50%) may still be used, however they are likely to increase heat and stress on the panel surface, reducing the panels overall lifespan and increasing the level of coating maintenance required to maintain an acceptable visual appearance.

Some film forming stains (i.e. coatings with the consistency of paint but with an appearance similar to penetrating stains) may offer similar protection qualities to paints however advice and assurance should be sought from the coating manufacturer as to their suitability for use with Shadowclad prior to application.

Where paints or film forming stains are to be used, Shadowclad Ultra is recommended. Shadowclad Ultra features a factory applied performance coating which in most cases eliminates the use of time consuming wet primers. (See Table 9)

Shadowclad Natural can also be used with paint however a conventional wet primer is required as part of the coating manufacturers overall system specification.

Penetrating Stains

Penetrating stains show the natural texture and character of timber and are widely used on Shadowclad exterior cladding.

Penetrating stains offer less protection for panels from exterior weathering than paints and film forming stains which are considerably thicker in surface film build. Due to their translucency, penetrating stains are likely to require additional coating maintenance during the panel's life to maintain an acceptable visual appearance.

Penetrating stains should only be used on Shadowclad Natural and are not recommended for use on Shadowclad Ultra.

CHH Woodproducts does not recommend the use of linseed oil based coating which have the potential to promote mould growth in this product.

Clear Coatings & Uncoated Shadowclad®

If Shadowclad is left uncoated or is clear coated in exterior applications the long term aesthetics of the board will be significantly reduced. While the product will meet durability and weathertightness requirements under E2/AS1 a high visual appearance will not be achieved in the long term.

Face Checking

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture which is exacerbated by darker colours. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. If you are the specifier, it is important to discuss these issues with your client before finalising colour choice. If checking occurs, repaint with a good quality, 100% acrylic exterior house paint in accordance with the manufacturer's instructions, thoroughly working paint into the face checks with a paint brush.

Table 9	Coating System for Shadowclad® Ultra
Within 3 months of erection	**Ensure the panel is clean and dry prior to top coating. Top coat with two coats of premium 100% acrylic exterior house paint.**
OR	
Within 3 to 6 months of erection	**Wash the surface with a mild detergent solution to remove any chalky material prior to top coating. Top coat with two coats of premium 100% acrylic exterior house paint.**

Note: For best results

i/ allow 24 hours between coats

ii/ use a light coloured paint system, LRV above 50%

iii/ Recommend panel be washed down prior to painting to remove any sea salt spray or dirt deposits

iv/ Minimum total coating film build of 90 microns is recommended, including a minimum 30 microns per coat

5.4 COATING REQUIREMENTS IF RUN OFF IS USED FOR DRINKING WATER

Chemical manufacturers recommend that any run-off from treated surfaces should not be used for drinking water. Unsealed (eg unpainted) plywood claddings should not be used in situations where run-off directly from such claddings is collected in water tanks for drinking water. Ensure selected coatings act as a sealant and refer to the coating manufacturer's Material Safety Data Sheets to confirm specified coatings are suitable for use in these applications.

6.0 MAINTENANCE

All cladding materials, including Shadowclad, require careful and regular product maintenance by the building owner throughout the cladding's normal service life to ensure long term durability and to maintain visual aesthetics.

Claddings:

At a minimum, Shadowclad should be maintained by:

- Regularly washing it down (at least annually) with a mild detergent or solution to remove surface dirt, moss, mould, and sea spray
- Inspect on at least a yearly basis paying particular attention to sheet joints, corners and bases
- Keep dirt, soil or leaf build-up at least 150 mm away from the base of panels
- Clean spouting and downpipes as required, so that stormwater is not overflowing onto the cladding
- Repaint as soon as the first sign of coating deterioration is identified in accordance with the coating manufacturer's specifications (including edges and sheet bottoms)
- Panel recoating requirements may vary depending on climate, orientation to the sun, coating type and coating colour selected
- Maintain the exterior envelope and connections including joints, penetrations, flashings, heat pumps, and sealants that may provide a means of moisture entry beyond exterior cladding to comply with the requirements of the NZBC Clause E2 - External Moisture
- Prune back vegetation which is close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned
- DO NOT use water blasters to wash down the cladding

Flashings:

- Flashings should be periodically cleaned on a similar basis to the glass in windows
- Clean Shadowclad™ flashings with a diluted solution of mild liquid detergent avoiding excessively hot solutions. Use a soft bristle brush. DO NOT use abrasive tools or cleaners on the coating
- After cleaning, rinse thoroughly with fresh water. DO NOT use strong solvent type cleaners. Where the use of solvents is required, such as cleaning paint spills, use nothing other than methylated spirit. Ensure contact time is as short as possible, and rinse the solvent cleaner thoroughly from the surface with copious amounts of quality drinking water
- Where cavity base closures are installed, ensure drainage holes are kept clear

7.0 FREQUENTLY ASKED QUESTIONS

Q: Where can Shadowclad be used?

A: Shadowclad can be used as both exterior cladding or as an internal lining (moisture free areas only). For interior linings untreated Shadowclad should be used. For exterior cladding H3 treated Shadowclad is required.

Q: Do I have to re-treat cut edges of Shadowclad panels?

A: H3 treated Shadowclad is envelope preservative treated. All cuts made in treated plywood **must** have a brush on preservative treatment applied fully to the cut area. CHH Woodproducts recommends the use of Holdfast® Metalex® Clear.

Q: When used as an exterior cladding what are the durability expectations of Shadowclad?

A: Under the NZBC Shadowclad (when used as an exterior cladding) is required to meet a 15 year minimum durability level.

To achieve a 15 year durability Shadowclad must be:

- H3 preservative treated
- Uncoated Shadowclad will meet the durability and weathertightness requirements, but a high visual appearance will not be achieved in the long term
- Coated with a good quality penetrating stain, film forming stain or paint system
- Coatings must be regularly maintained as part of a normal building maintenance program throughout the life of the building

Shadowclad is not recommended to be left uncoated when used as an exterior cladding

Note – durability according to the NZBC refers to the products ability to continue to perform its primary function as protection for the building structure. Appearance including the performance of the coating product is not covered under the NZBC durability requirements.

Q: Can Shadowclad, when used as an exterior cladding, be coated in dark colours?

A: Dark colours (coatings with an LRV of below 50%) will achieve a 15 year durability however customers must expect an increased level of recoat and general product maintenance compared to where light coating colours are used.

The greatest level of cladding protection and least amount of coating maintenance can be achieved by using a good quality paint system (applied as per the coating manufacturers specifications) with an LRV of 50% or greater and a minimum total coating system film build of 90 microns, including a minimum 30 micron thickness per coat.

For further information on coatings always refer to the applicable coating manufacturer's specification material

Q: Does Shadowclad comply with the NZBC Requirements?

A: Shadowclad has been tested in accordance with E2/VMI and AS/NZS 4284 "Testing of Building Facades" for compliance with the NZBC requirements and has been BRANZ appraised for use in cavity fix construction.

Q: In the Shadowclad™ exterior flashing range can I colour the flashings to match the colour of my building?

A: Shadowclad aluminium exterior flashings are available in either anodised or mill finishes. Anodised flashings are silver in colour and can be installed immediately. Mill finished flashings can be powder coated to specific colours by the customer.

Q: Does face checking affect the performance of Shadowclad?

A: Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture which is exacerbated by darker coloured coatings. These checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way.

8.0 REFERENCES AND SOURCES OF INFORMATION

- New Zealand Building Code (NZBC)
- AS/NZS 2269:2012 "Plywood Structural"
- AS/NZS 1604.3:2010 "Specification for Preservative Treatment, Part 3: Plywood"
- NZS 3602:2003 "Timber and Wood-Based Products for use in Buildings"
- AS/NZS 4284:2008 "Testing of Building Facades"
- NZS 3603:1993 "Timber Structures Standard"
- NZS 3604:2011 "Timber Framed Buildings"
- AS 3715:2002 "Metal Finishing – Thermoset powder coating for architectural application of aluminium and aluminium alloys"
- NZBC Clause 'E1/AS1 – Surface Water'
- NZBC Clause 'E2/AS1 – External Moisture'
- NZBC Clause 'E3/AS1 – Internal Moisture'
- NZBC Clause 'B2/AS1 – Durability'
- Product Technical Statement – Shadowclad for Cavity Construction
- Ecoply® Specification and Installation Guide
- Ecoply Barrier Specification and Installation Guide
- CHH Woodproducts technical notes – downloadable from www.chhwoodproducts.co.nz/document-library
- Material Safety Data Sheets
  - MSDS Azole Treated Plywood, LVL & I-Joists
  - MSDS CCA Treated Plywood & I-Joist
  - MSDS Stainless Steel flashings
- Producer Statement Aluminium Flashing
- Window Association of New Zealand (www.wanz.org.nz)
- APA (www.buildabetterhome.org)
- EWPAA (www.ewp.asn.au)
- BRANZ Appraised 764 – Shadowclad Cavity Fixed Cladding System
- BRANZ Recommendations for Building Maintenance

Standards can be purchased online at www.standards.co.nz

Building Code Compliance Documents can be downloaded free of charge at www.dbh.govt.nz

Line drawings within this literature can be downloaded from www.chhwoodproducts.co.nz/document-library

9.0 LIMITATIONS

The information contained in this document is current as at September 2015 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Shadowclad products installed in accordance with this document or the NZBC compliance documents.

This publication replaces all previous CHH Woodproducts design information and literature relating to Shadowclad structural plywood products and flashings. CHH Woodproducts reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

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

SHADOWCLAD® KEY INSTALLATION & DESIGN POINTS

EXTERIOR CLADDING APPLICATIONS

The following tasks are provided to installers to point out key installation and design factors when used as an exterior cladding. These do no detract from the requirements to read and understand this literature as a whole.

Task	Tick when checked
Prior to Specification and Installation	
Read the Shadowclad Specification and Installation Guide in its entirety	☐
Framing Plan	
Framing setout drawings to suit Shadowclad fixing and installation guidelines	☐
Sheet Cuts	
Coat all sheet cuts with a preservative timber treatment such as Holdfast® Metalex® Clear	☐
After applying Holdfast® Metalex® Clear, apply the surface coating (e.g. paint or stain) to cut edges	☐
Place uncut edge to bottom	☐
Fastener Material Type	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones and with H3.2 CCA treated Shadowclad Ultra)	☐
Sheet Fastener Pattern	
Around sheet edge – maximum 150mm centre spacing	☐
Within sheet body – maximum 300mm centre spacing	☐
Horizontal Sheet Joints	
Minimum 9mm separation gap between sheets above all Horizontal Z flashings	☐
Prime the bottom of the sheet edge and 150mm up the back (rear) of the sheets	☐
50 mm strip of neutral cure silicon sealant or stop ends at all Z flashing terminations excluding terminations at Shadowclad™ metal corner flashings	☐
Back flashings or 150 mm overlap to all flashing butt joints	☐
Expansion Gaps Between Sheets (Vertical Sheet Joints)	
Texture Profile Sheets - 2mm gap between vertical edges of sheets	☐
Groove Profile Sheets - 9mm gap (i.e. full groove space) between vertical edges of sheets	☐
Note: Expansion gaps required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
Ground Clearances	
Paved/ Sealed Ground - minimum 100mm distance from the ground to sheet bottom	☐
Broken Ground - minimum 175mm distance from the ground to sheet bottom	☐
Prime the bottom of the sheet 150mm up the back (rear) of the sheet	☐

Refer to the current Shadowclad Specification and Installation Guide for full installation specifications and suggested details

shadowclad®

BRANZ Appraised
Appraisal No.764 [2011]

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September 2015

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