EXTERNAL WALL SYSTEM DISCLOSURE STATEMENT (DESIGN)

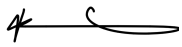
EXTERNAL WALL COMPONENTS (TYPE A & B CONSTRUCTION)

This statement must be completed by a Registered Architect, Façade Engineer, suitably qualified Design Manager or other Professional as agreed with Blackett Maguire + Goldsmith

Project Name:	SMALL ROAD PUBLIC SCHOOL
Address:	3 SMALL RD RYDE
Part of Building to be certified:	ALL BUILDING

- I confirm that the table provided overleaf identifies all the proposed external wall systems and wall elements designed for the subject development, including the component elements of those systems, and any attachments thereto.
- I have undertaken reasonable investigations to ascertain that these systems and components comply with the non-combustibility requirements of Clause C1.9 of the BCA, such as reviewing product technical information, fire test reports, code mark certificates, fire-engineer's reports and external consultant advice.
- Supporting documents that demonstrate compliance for each wall type with the relevant sections of the BCA are provided and attached.
- I am a suitably qualified person and my qualifications and accreditations are listed below.
- The information contained in this statement is true and accurate to the best of my knowledge.

Relevant qualifications and accreditations: 17 YEARS WORKING EXPERIENCES AND LICENSED

Name:	DAVID LU	**Qualification / Licence No.:**	251344C
Company Name:	BRIGHT CEILING	**ABN No:**	23108652464
Company Address:	*P O BOX 65* *WAHROONGA 2076*	**Tel:**	0410663113
Signature:		**Position Title:**	DIRECTOR
		Date:	06/01/2019

EXTERNAL WALL ELEMENTS TABLE The table below must be completed for all wall types.

LINING / CLADDING MATERIAL *(Note. Nominate every type of external cladding and/or wall material)*

External Cladding Material (Eg Fibre cement, Aluminium composite panel, masonry etc)	**Elevation(s)**	**Structural frame material**	**Manufacturer**	**Product Name**	**Test Report, Codemark certificate or Fire Engineering Report** (List all documents evidencing compliance)	**Nominated or proprietary installation requirements** (relevant installation details or guidelines must be listed below and attached)
Fibre Cement	L1 & L2 Inner	Steel	VitraGroup	VitraPanel	FNE8727	Installation guide is attached
Fibre Cement	GF & L1 & L2 Outer	Steel	Equitone	Equitone	TECHINCAL NOTES E-/45/01/EN/V5 AU	Installation guide is attached

INSULATION *(list all types incorporated in the external wall systems)*

Material	**Elevation**	**Manufacture**	**Product Name**	**Test Report reference**
Glasswool Insulation	GF & L1 & L2	Knauf Insulation	Earthwool® External Wall batts	CM30094 Rev1

SARKING *(list all types incorporated in the external wall systems)*

Manufacture	**Elevation**	**Product Name**	**Test Report reference**
TBA Firefly	GF & L1 & L2	TBA Firefly Non-Combustible SARKING	Data sheet No 36

ANCILLARY ELEMENTS (signage, decorative battens, fins, shade structures, awnings etc *(list all types attached to the external wall systems)*

Manufacture	**Elevation**	**Product Name**	**Test certificate reference**

EXTERNAL WALL SYSTEM DISCLOSURE CERTIFICATE (INSTALLATION)

EXTERNAL & COMMON WALL COMPONENTS (TYPE A & B CONSTRUCTION)

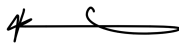
Note: This certificate must be completed by the Head Contractor, their representative or other supervising professional such as the Project Architect or Façade Engineer or other Professional as agreed with Blackett Maguire + Goldsmith

Project Name:	SMALL ROAD PUBLIC SCHOOL
Address:	3 SMALL RD RYDE
Part of Building to be certified:	ALL BUILDING

I hereby certify that

- I have reviewed and inspected the installation of the external wall systems for the project;
- The wall systems have been installed as nominated in the approved External Wall System Disclosure Statement (Design) for the project which is attached;
- The wall systems have been installed in accordance with any relevant Manufacturer's installation requirements, Code Mark Certificate requirements, relevant Fire-safety Engineering requirements and any other requirements necessary to ensure compliance;
- Only the products identified in the External Wall System Disclosure Certificate (Design) have been installed and substitute products have not been used.
- I am a properly qualified and experienced person and have a good working knowledge of the relevant requirements referenced above. (My qualifications and accreditations are listed below)
- I / my employer holds appropriate, current professional indemnity insurance to the satisfaction of the building owner or the principal authorising the work being certified.
- The information contained in this statement is true and accurate to the best of my knowledge.

Relevant qualifications and accreditations: 17 YEARS WORKING EXPERIENCES AND LICENSED

Name:	DAVID LU	**Qualification / Licence No.:**	251344C
Company Name:	BRIGHT CEILING	**ABN No:**	23108652464
Company Address:	*P O BOX 65 WAHROONGA 2076*	**Tel:**	0410663113
Signature:		**Position Title:**	DIRECTOR
		Date:	06/01/2020

EXTERNAL WALL ELEMENTS TABLE The table below must be completed for all wall types as installed

LINING / CLADDING MATERIAL *(Note. Nominate every type of external cladding and/or wall material)*

External Cladding Material (Eg Fibre cement, Aluminium composite panel, masonry etc)	**Elevation(s)**	**Structural frame material**	**Manufacturer**	**Product Name**	**Test Report, Codemark certificate or Fire Engineering Report** (List all documents evidencing compliance)	**Nominated or proprietary installation requirements** (relevant installation details or guidelines must be listed below and attached)
Fibre Cement	L1 & L2 Inner	Steel	VitraGroup	VitraPanel	FNE8727	Installation guide is attached
Fibre Cement	L1 & L2 Outer	Steel	Equitone	Equitone	TECHINCAL NOTES E-/45/01/EN/V5 AU	Installation guide is attached

INSULATION *(list all types incorporated in the external wall systems)*

Material	**Elevation**	**Manufacture**	**Product Name**	**Test Report reference**
Glasswool Insulation	L1 & L2	Knauf Insulation	Earthwool® External Wall batts	CM30094 Rev1

SARKING *(list all types incorporated in the external wall systems)*

Manufacture	**Elevation**	**Product Name**	**Test Report reference**
TBA Firefly	L1 & L2	TBA Firefly Non-Combustible SARKING	Data sheet No 36

ANCILLARY ELEMENTS (signage, decorative battens, fins, shade structures, awnings etc *(list all types attached to the external wall systems)*

Manufacture	**Elevation**	**Product Name**	**Test certificate reference**

Certificate of Test

Quote No.: HF07ANE5439

REPORT No.: FNE8727

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: VitraPanel Pre-finished Compressed Fibre Cement (CFC)

SPONSOR:
Vitragroup Pty. Limited.
13 Bromley Road
EMU PLAINS NSW
AUSTRALIA

DESCRIPTION OF TEST SPECIMEN: The sponsor described the tested specimen as a prefinished fibre-reinforced cement board comprising four layers:

Finish coat:	70-µm thick Vitrathane V744.
Seal coat:	25-µm to 40-µm thick Vitrecure 10.
Under Seal coat:	100-µm thick Vitrethane 555.
Fibre-cement sheet:	compressed fibre-reinforced cement sheet.

Nominal total thickness:	4.5-mm to 24-mm
Nominal specific gravity:	1.66-g/mm³ to 1.83-g/mm³
Colours:	grey/beige natural finish

TEST PROCEDURE: Six samples were tested in accordance with Australian Standard 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m²)	N/A	N/A
Smoke Release ($log_{10}D$)	-1.983	0.065

For regulatory purposes these figures correspond to the following indices:

Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)
0	0	0	1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 20 October 2006
Issued on the 30th day of October 2006 without alterations or additions.

Russell Collins
Testing Officer

Garry E Collins
Manager, Fire Testing and Assessments

NATA

This laboratory is accredited (Accreditation No. 3632) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

CSIRO

CSIRO Manufacturing & Infrastructure Technology
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555

Facade systems

Installation guide

ExoTec® facade panel
and fixing system

James Hardie
A smarter way to build

AUSTRALIA JULY 2014

CONTENTS

WE VALUE YOUR FEEDBACK

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

Ask James Hardie™
Fax 02 9638 9535
literaturefeedback@jameshardie.com.au

1 INTRODUCTION

The James Hardie ExoTec® facade panel provides a durable, expressed joint panel appearance for building facades and fascias and together with the ExoTec® fixing system, offers versatility to architects and builders. A variety of design styles can be created including curved walls, panels installed upright vertically, horizontally or in a brick pattern.
A wide range of decorative finishes can be used including site-applied acrylic textures and available factory-applied polyurethane plain colours and metallic finishes.

This document is a guide only. It is intended for use by builders, cladding installers and other contractors who may be involved with the installation of the ExoTec facade panel and fixing system.

This document must be read in conjunction with the project specific drawings and specifications as well as the current James Hardie ExoTec facade panel and fixing system Technical Specification.

Both the 9mm and 12mm thick ExoTec facade panels may be used in wall facades, fascias and soffits.

If you are an installer…
Ensure that you follow the design, moisture management and associated details and material selection provided by the designer. This installation manual must be read in conjunction with the ExoTec facade panel technical specification.

If you are a specifier…
or other responsible party for a project, ensure the information in these specifications is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Make sure your information is up to date
When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.com.au or Ask James Hardie™ on 13 11 03

NOTE
All dimensions shown are in millimetres unless noted otherwise. All Australian Standards referenced in this manual are current edition and must be complied with.

2 INSTALLATION OVERVIEW

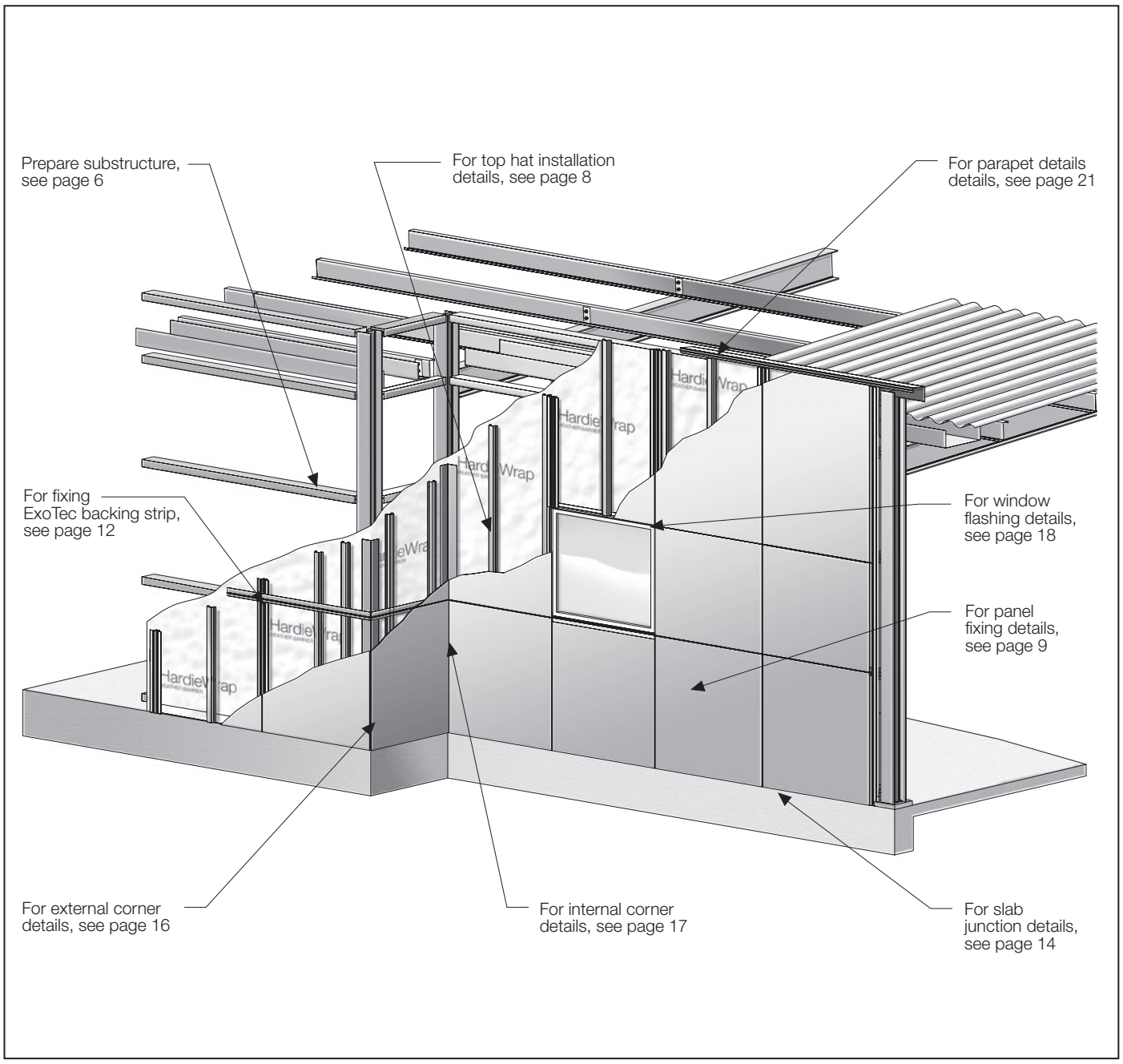


FIGURE 1 INSTALLATION OVERVIEW

HardieWrap™ weather barrier

HardieWrap™ weather barrier must be installed behind Exotec® Facade Panel and Fixing system in accordance with the AS/NZS 4200.2 'Pliable building membranes and underlays – Installation' and HardieWrap™ Technical Data Sheet.

HardieWrap™ weather barrier delivers a tripleshield of protection to help against external weather penetration, internal condensation build-up and external heat penetration. Additionally, it enhances the wall thermal performance, please refer to www.jameshardie.com.au or www.accel.com.au for more information.

If using an alternate product in lieu of HardieWrap™ weather barrier, the designer must ensure that the product is fit for purpose and it has the following properties in accordance with AS/NZS 4200.1:

- Vapour barrier - low or medium
- Water barrier - high

In hot humid areas of Australia, HardieWrap™ weather barrier may not be suitable, refer to the building designer for a suitable membrane and Ask James Hardie® on 13 11 03.

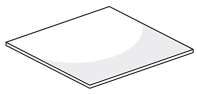
Soft compressible insulation installed between the front of the wall studs and directly behind the external cladding can cause installation issues and is thus not recommended.

Thermal Break

For steel frames, the Building Code of Australia sections J1.5 and 3.12.1 volumes 1 and 2 respectively, state for both residential and commercial buildings a thermal break with an R 0.2m^2 K/W must be installed behind external cladding where the cladding and internal lining make direct contact with the same steel frame. James Hardie® recommends the HardieBreak™ Thermal Strip. Refer to the HardieBreak™ thermal strip installation guide for more information.

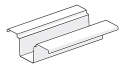
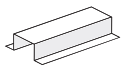
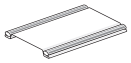
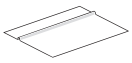
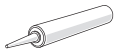
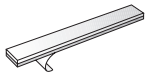
3 PRODUCT INFORMATION

EXOTEC FACADE PANEL INFORMATION

PRODUCT	DESCRIPTION	QUANTITY / SIZE (NOMINAL)		
		Thickness	Width	Lengths
	**ExoTec facade panel** Dense compressed panel. Square edge. Factory sealed on all six sides. Each panel has a distinctive white face, which accepts a wide range of paint finishes. The panel must be installed with the white side facing the exterior of the structure. Nom. density: 1550kg/m^3	9mm	900mm 1200mm	1800, 2400, 3000 1800, 2100 2400, 2700, 3000
		12mm	1200mm	2400, 3000

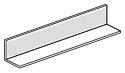
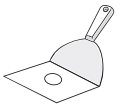
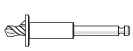
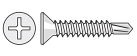
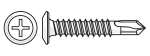
*All dimensions and masses are approximate and subject to manufacture tolerances.

PRODUCT / ACCESSORIES / TOOLS SUPPLIED BY JAMES HARDIE

ACCESSORIES	DESCRIPTION	QUANTITY/SIZE (APPROX)
	**ExoTec® Top Hat** A rolled metal section, for use with Exotec® facade panel and fixing system, designed to span vertically across the building structure to support facade panels and isolate differential movement of the panels from those of the structure. 124mm wide x 35mm deep x 1.15mm gauge thick. (Approximately)	45 per pack 6,000mm (304572) 7,200mm (304571)
	**James Hardie™ Intermediate Top Hat** A metal top hat installed vertically for use with ExoTec® and ComTex® façade panel and fixing system, for intermediate sheet support. 50mm wide x 35mm deep x 1.15mm gauge thick. (Approximately)	50 per pack 6,000mm (302701) 7,200mm (302700)
	**Exotec® Gasket Snap Strip. 3,620mm long** For use with the ExoTec® facade panel and fixing system, this gasket snap strip is specially designed to clip into the ExoTec® Top Hat at vertical façade panel joins to cover fixings to the structure and to provide an initial weather seal and drainage using a neoprene gasket.	10 per pack (305556)
	**James Hardie™ Backing Strip.1,190mm, 2390mm, 2990mm** A weather seal at horizontal panel joints for use with ExoTec® facade panel and fixing system and Scyon™ Matrix™ cladding.	10 per pack 1,190mm (305557) 2,390mm (305558) 2,990mm (305559)
	**James Hardie™ Façade Washers** Facade washers used for exposed fastener fixing with ExoTec® facade panel and fixing system and Scyon™ Matrix™ cladding.	1000 per bag (305565)
	**James Hardie™ Base Coat. 4kg tub, 15kg bag** A water-resistant base coat compound used to finish over countersunk fasteners with epoxy.	4 per box - 4kg, 1 each - 15kg 4kg tub (305535) 15kg bag (305591)
	**James Hardie™ Joint Sealant, 300ml cartridge** A general purpose, paintable, exterior grade polyurethane joint sealant.	20 per box (305534)
	**HardieBreak™ thermal strip** A building code requirement and is installed behind James Hardie external cladding over metal framing and HardieWrap™ weather barrier. Refer to HardieBreak™ thermal strip installation guide. Unit size 43 x 12 x 2750mm.	45 per pack (305612)
	**HardieWrap™ weather barrier** A non-perforated, highly breathable and reflective safe-glare weather barrier designed to be used behind ExoTec® facade panel and fixing system to help protect the building. Unit size 2750mm x 30000mm.	1 Each (305664)
TOOLS		
	**HardieBlade™ Saw Blade. 185mm diameter** A 185mm diameter poly-diamond blade for fast and clean cutting of James Hardie fibre cement.	1 Each (300660)

PRODUCT / ACCESSORIES / TOOLS NOT SUPPLIED BY JAMES HARDIE

James Hardie recommends the following products for use in conjunction with ExoTec facade system. James Hardie does not supply these products and does not provide a warranty for their use. Please contact component the manufacturer for information on their warranties and further information on their products.

ACCESSORIES	DESCRIPTION	ACCESSORIES	DESCRIPTION
	**Miscellaneous light gauge pressed metal section** Sections 1mm minimum to 1.2mm thickness (maximum) corrosion resistant metal. Used in internal and external corner details.		**Epoxy flush sealing (2 part)** Countersunk head screws are flush sealed using megapoxy P1 or Hilti CA 125. Where the temperature is below 15º use Hilti CA 273.
	**Bond breaker tape** Used when filling vertical joints to prevent sealant from bonding to top hat. Refer to the ExoTec facade panel and fixing system Installation Manual for suitable sealant.		**Cordless drill** Recommended tool for drilling holes and fastening screws.
	6mm masonry drill Provides a 6.2mm to 6.3mm diameter hole. Used to pre-drill clearance holes for fasteners.		**Base coat applicator** A recommended method of applying James Hardie base coat over epoxy filled countersunk screw heads. This method minimises waste. Base coat is easily sanded by comparison to epoxy fillers.
	**Countersunk head drill** 6mm Countersunk bit.		**Flexible tape** A flexible self-adhesive tape used in preparation of a window. Refer to the window installation section in this Installation Manual for more information.
FASTENERS			
	**Countersunk fasteners** No. 10x30 countersunk head self drilling screws - Class 3 Minimum coating. Fasteners must have the appropriate level of durability required for the intended project. Fasteners must be fully compatible with all other material that it is in contact with to ensure the durability and integrity of assembly. Contact fastener manufacturers for more information.		**Exposed head fasteners** No. 10x25mm pan, wafer or hex head self drilling screws Class 3 minimum coating. Fasteners must have the appropriate level of durability required for the intended project. Fasteners must be fully compatible with all other material that it is in contact with to ensure the durability and integrity of assembly. Contact fastener manufacturer for more information.

4 SAFE WORKING PRACTICES

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

James Hardie products contain sand, a source of respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'score and snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheets available at www.jameshardie.com.au. FAILURE TO ADHERE TO OUR WARNINGS, MATERIAL SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

JAMES HARDIE RECOMMENDED SAFE WORKING PRACTICES

CUTTING OUTDOORS

1. Position cutting station so wind will blow dust away from the user or others in working area.
2. Use a dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

SANDING/DRILLING/OTHER MACHINING

When sanding, drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES

1. NEVER use a power saw indoors.
2. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
3. NEVER dry sweep - Use wet suppression or HEPA vacuum.
4. NEVER use grinders.
5. ALWAYS follow tool manufacturers' safety recommendations.

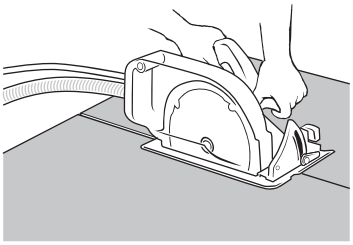
P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com.au to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

WORKING INSTRUCTIONS

Refer to recommended safe working practices before starting any cutting or machining of product.

HardieBlade™ Saw Blade

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



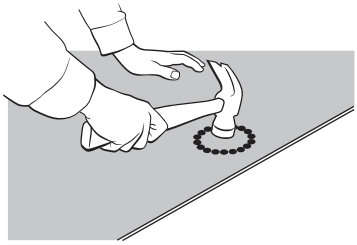
HOLE-FORMING

For smooth clean cut circular holes:

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

For irregular holes:

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



STORAGE AND HANDLING

To avoid damage, all James Hardie building products should be stored with edges and corners of the sheets protected from chipping.

James Hardie building products must be installed in a dry state and protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water, moisture, etc.

QUALITY

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

5 PREPARATION

Prior to installation of the ExoTec Facade Panel and Fixing System ensure that the required preparation steps have been followed, see Figure 2

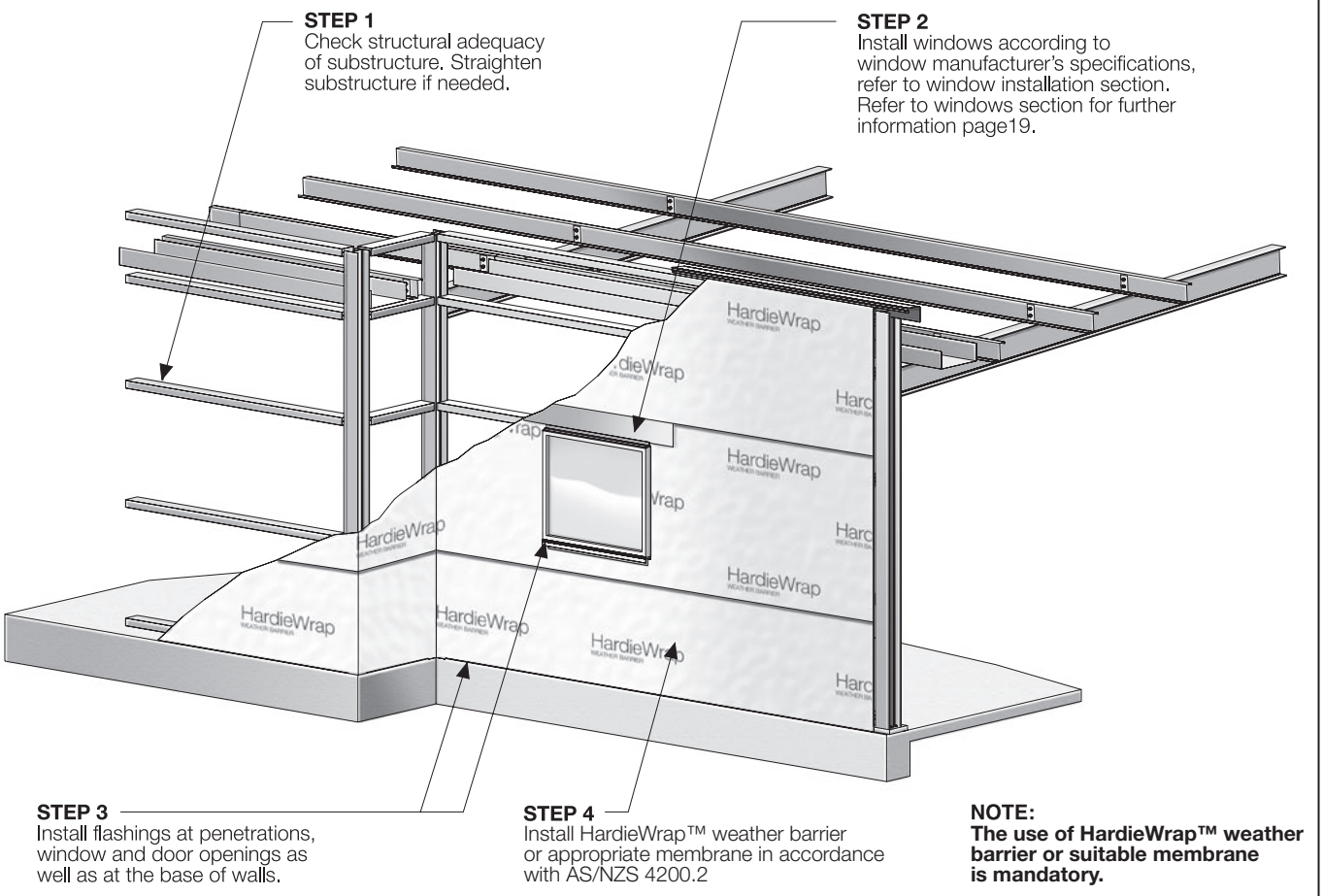


FIGURE 2 PREPARATION OF SUB-STRUCTURE

NOTES

1 . For high walls it may be necessary to provide flashing to drain the facade at one or more intermediate levels.
The installation of any barrier must not restrict moisture from reaching flashings and draining out.

2. The engineer must limit the deflection of the supporting structure to span/250 for serviceability Wind Load. See Clause 2.6 of the ExoTec facade panel and fixing system Technical Specification.

6 PANEL AND TOP HAT LAYOUT

The ExoTec facade panel can be installed upright horizontally or vertically. The panel layout will determine the location of the ExoTec and intermediate JH top hats, see Figures 3 to 6. The vertical expressed joints may be aligned or offset in a brick pattern layout.

KEY
TH: ExoTec top hat
INT: Intermediate JH top hat

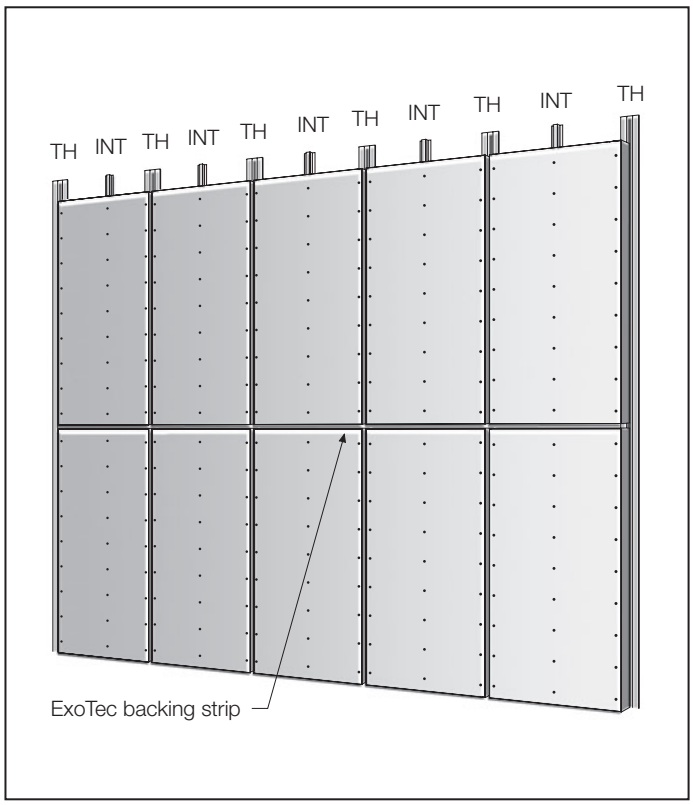


FIGURE 3 VERTICAL LAYOUT ALIGNED GRID PATTERN

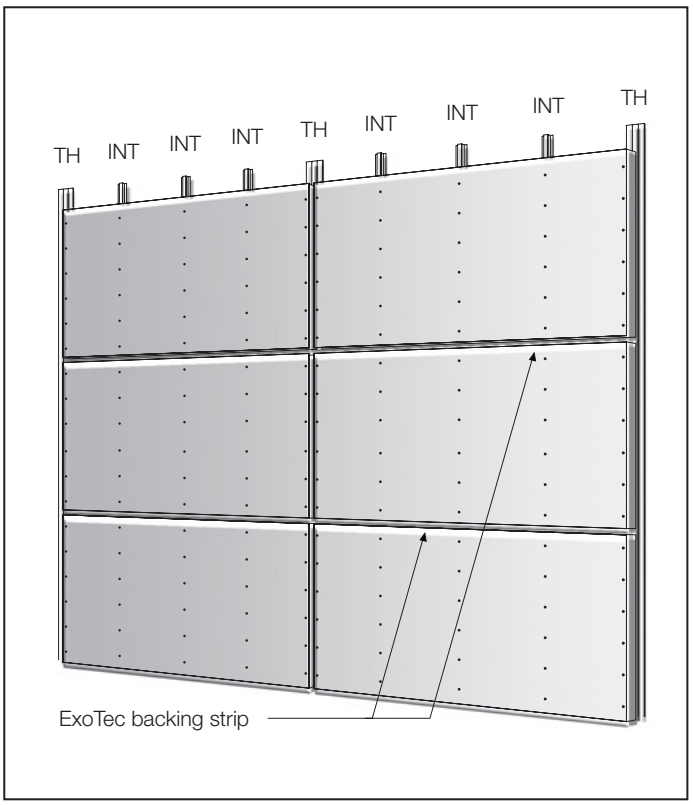


FIGURE 5 HORIZONTAL LAYOUT ALIGNED GRID PATTERN

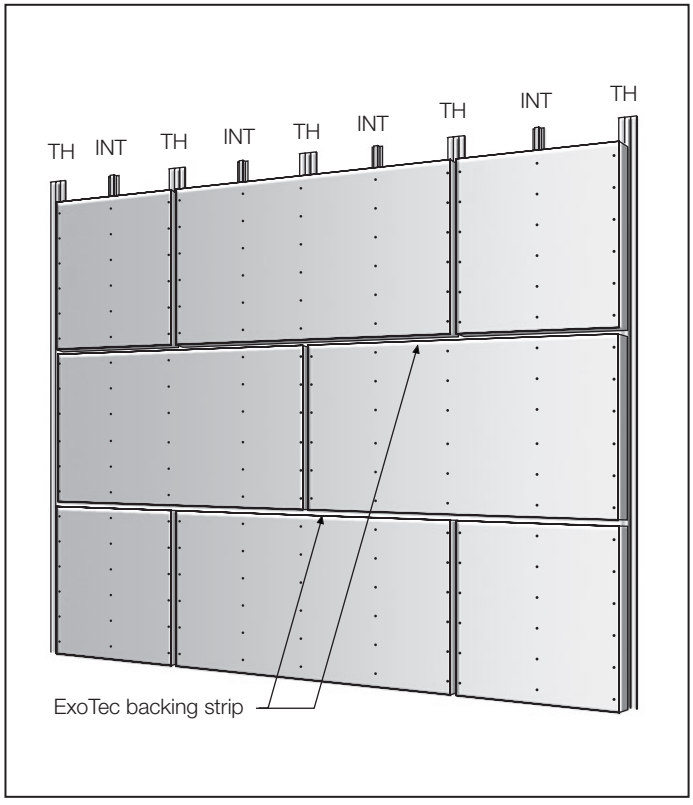


FIGURE 4 HORIZONTAL LAYOUT BRICK GRID PATTERN

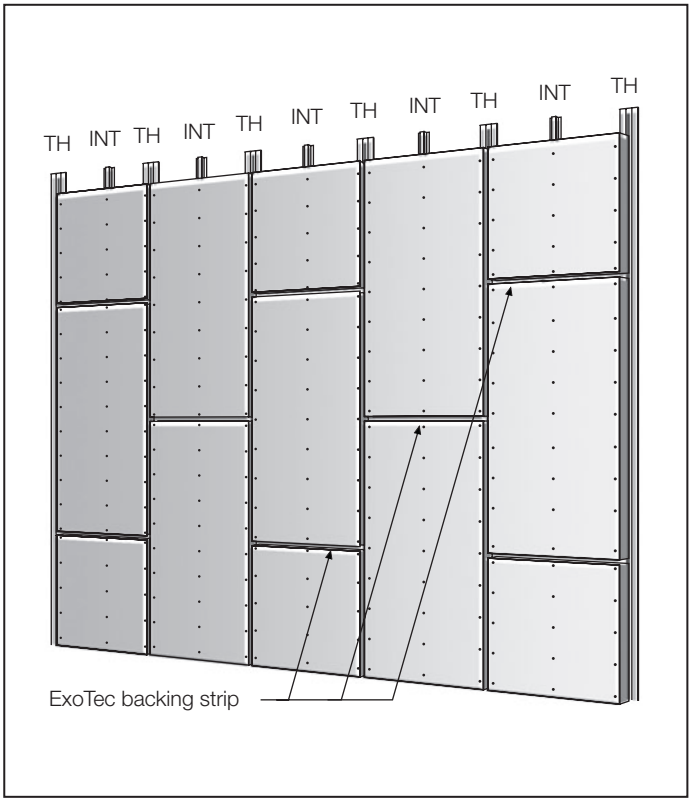


FIGURE 6 VERTICAL LAYOUT BRICK GRID PATTERN

7 INSTALLATION

TOP HAT INSTALLATION

ExoTec facade panels must be fixed to:

1) ExoTec top hat for vertical sheet joints.
2) Intermediate JH top hat for supporting the panels between vertical sheet joints.

The top hats must be installed vertically over steel, masonry or timber structures, see Figure 7. The top hat fixing to the structure must be as per the engineer's detail.

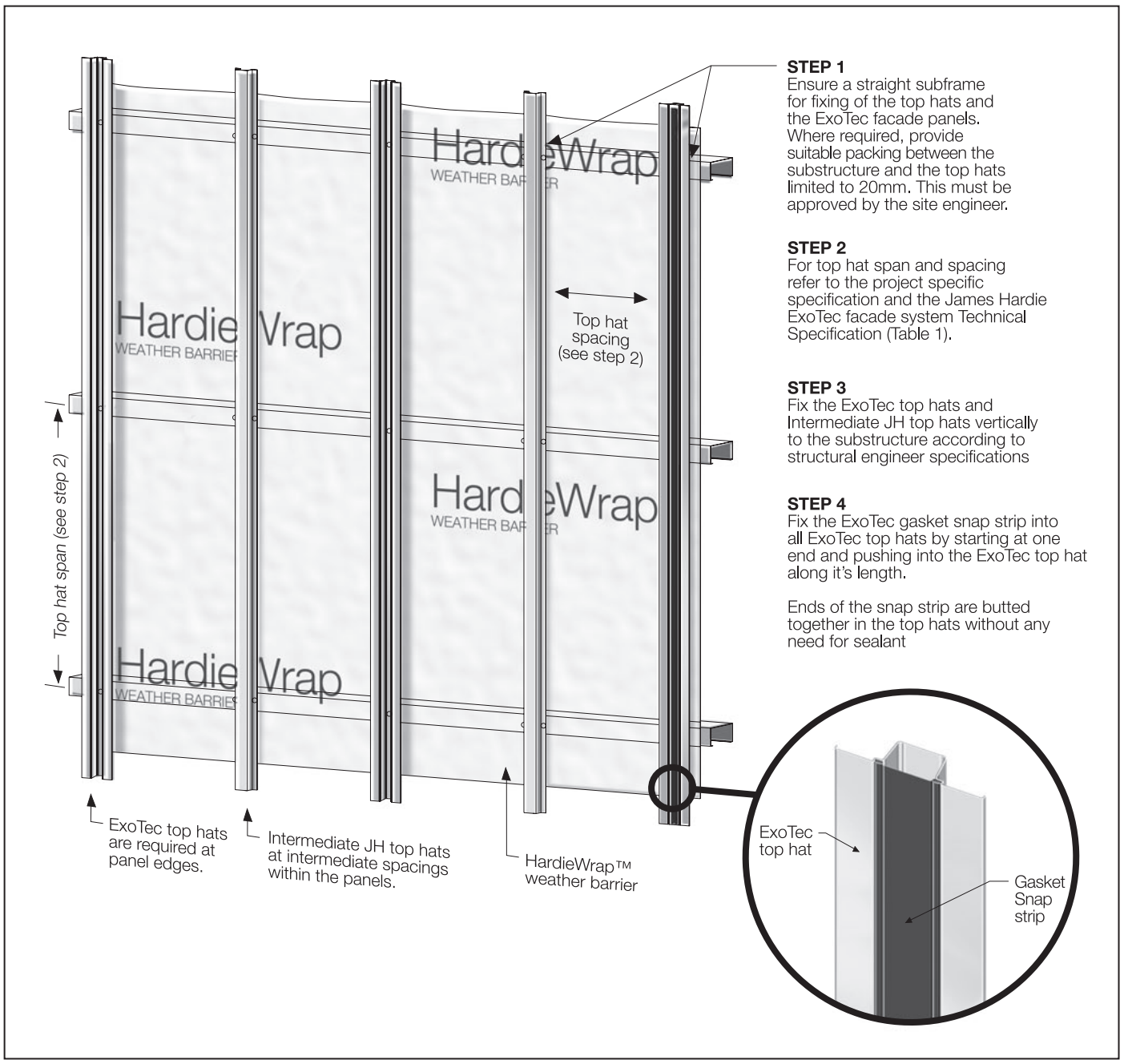


FIGURE 7 TOP HAT INSTALLATION

PANEL INSTALLATION

Panels are installed with a 10mm nominal expressed joint between adjacent panels, vertically and horizontally. Vertical joints up to 20mm width can be formed, with additional care required at installation to ensure the panel edges cover the ExoTec gasket snap strip on both sides of the joint. A minimum vertical expressed joint of 6mm is allowed with care. Horizontal joints are a nominal 10mm.

NOTE

When applying sealant to the edge of the ExoTec facade panel, refer to page 13 for recommended sealants.

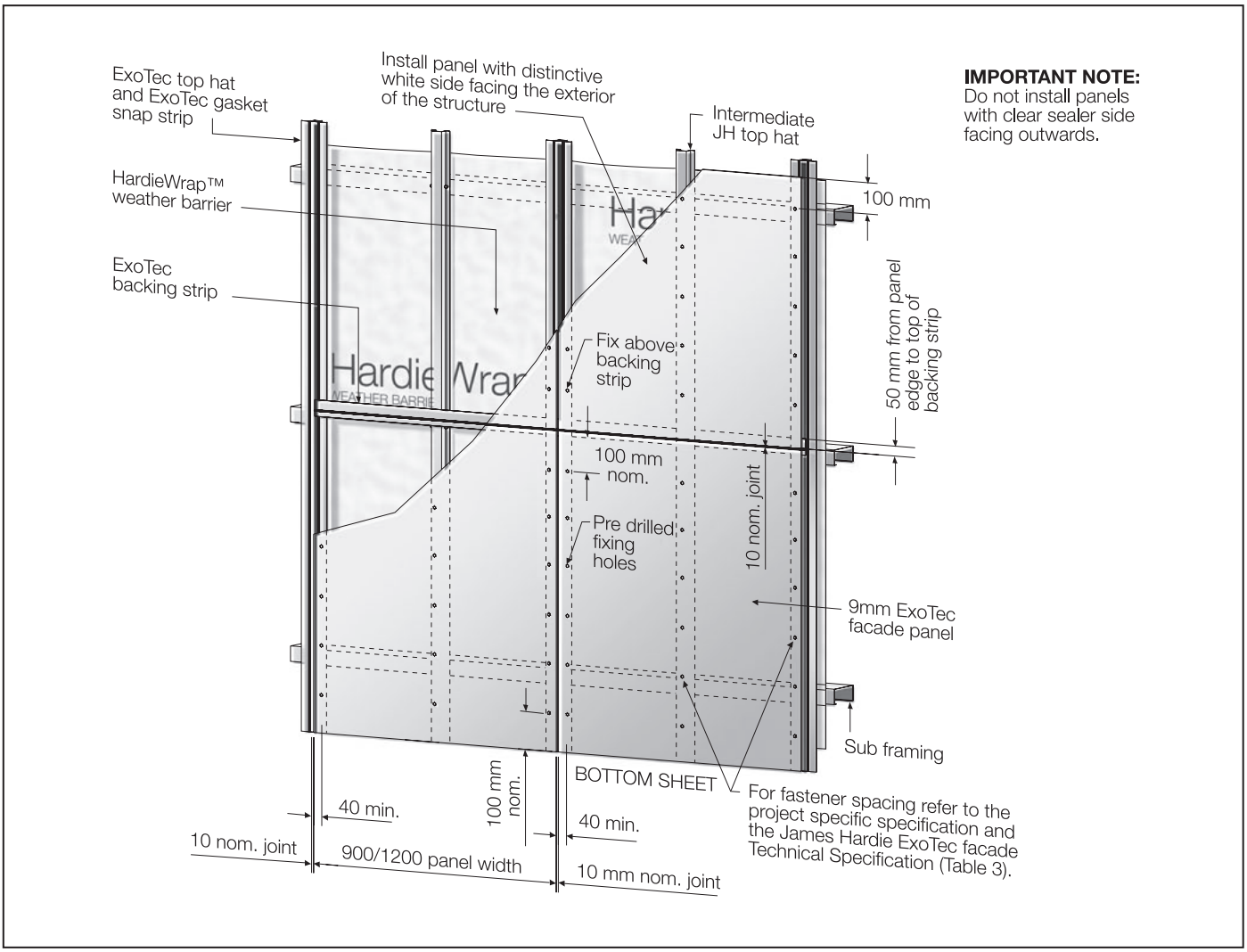


FIGURE 8 TYPICAL PANEL AND FRAMING LAYOUT

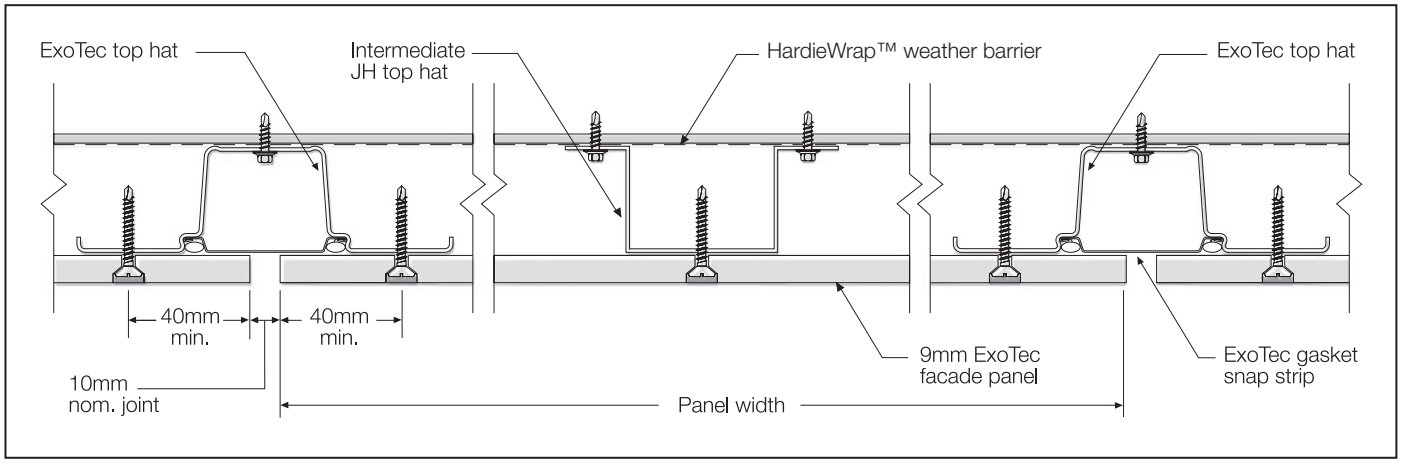


FIGURE 9 TOP HAT AND PANEL FIXING DETAIL

FASTENING METHODS

Panels may be fixed to ExoTec top hats and intermediate JH top hats by either:

1. **Countersunk fasteners:** flush finished over screw heads with a suitable epoxy, and then with James Hardie base coat. Generally used with site-applied acrylic coatings.
2. **Exposed head screws:** using pan, wafer or hex head screws. Used where pre-finished panels are installed. Exposed head fasteners may be colour coated to match panel finish.

Fasteners must have the appropriate level of durability required for the intended project. This is of particular importance in coastal areas, subject to salt spray and other corrosive environments.

Fasteners must be fully compatible with all other materials that the fasteners will come in contact with, to ensure the durability and integrity of assembly.

See Tables 3 and 4, for maximum fastener spacings to top hats for design wind pressure in the current ExoTec facade panel and fixing system Technical Specification.

Contact fastener manufacturers for more information.

Countersunk Fasteners

1. Mark fastener locations as specified, see Figure 8.
2. Drill clearance holes into ExoTec facade panel, for No.10 gauge screws using a 6mm countersunk masonry drill, which provides a 6.2 to 6.3mm diameter hole, see Figure 10. countersink hole to a depth of 2.5mm to 3mm. This is measured from the top of the screw to the top of the sheet, see Figure 15.

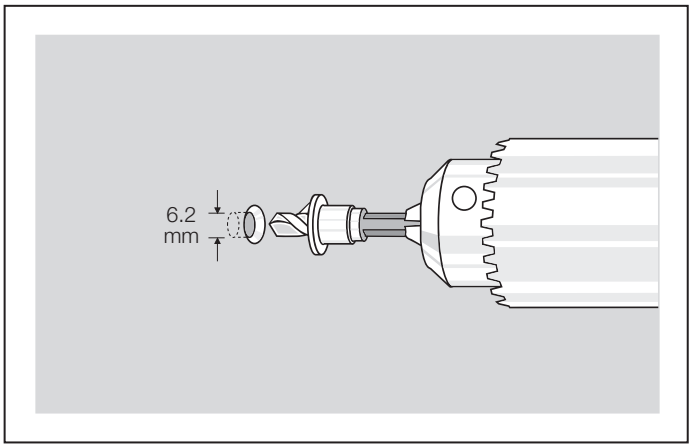


FIGURE 10 DRILL COUNTERSINK HOLE

NOTE

Do not use hammer action.

3. Fasten panel into top hat with corrosion resistant (Class 3 min.) No. 10 gauge x 30mm countersunk head self drilling fasteners. For areas within a corrosive environment refer to fastener manufacturer for suitability and compatibility of fasteners.
4. Clean dust out of holes to ensure adhesion of epoxy sealer.
5. Mix only sufficient epoxy for immediate use. James Hardie recommends the use of megapoxy P1 or Hilti CA 125. Where the temperature is below 15ºC, use Hilti CA 273.
6. Cover countersink fastener with epoxy leveled flush with sheet. To accommodate for second coat do not overfill hole. Allow epoxy to cure.

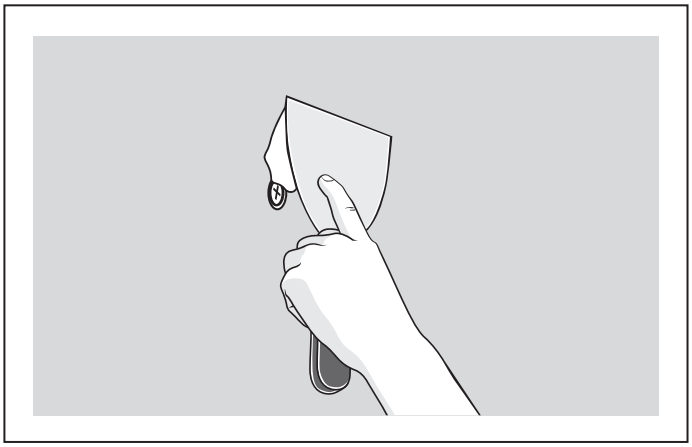


FIGURE 11 COVER COUNTERSINK FASTENER WITH EPOXY

7. Apply James Hardie base coat over epoxy using the base coat applicator. See Figures 12, 13, and 14.

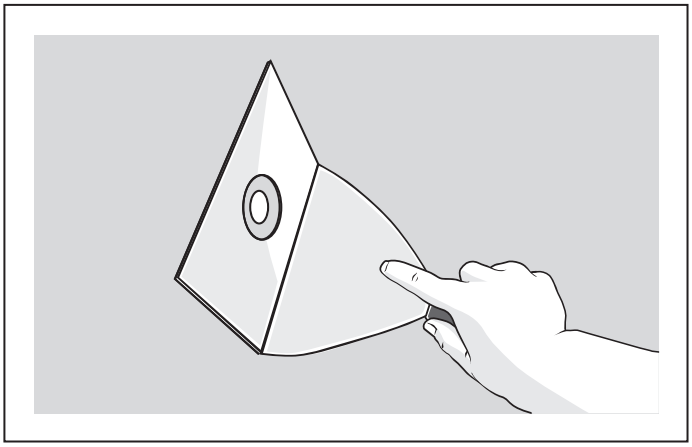


FIGURE 12 FIX BASE COAT APPLICATOR OVER EPOXY FILLED SCREW HEAD

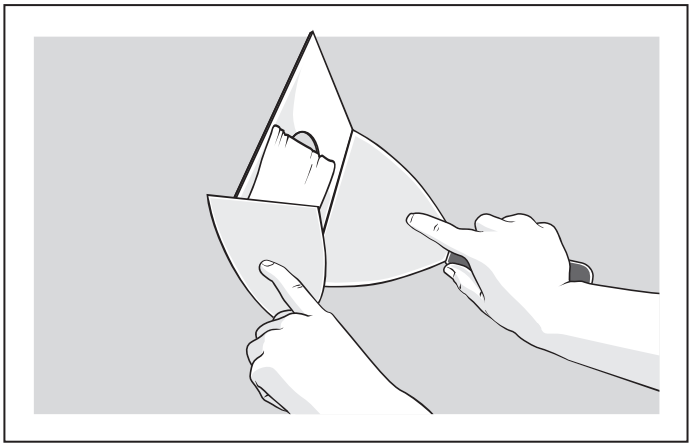


FIGURE 13 APPLY JAMES HARDIE BASE COAT OVER EPOXY FILLED SCREW HEAD

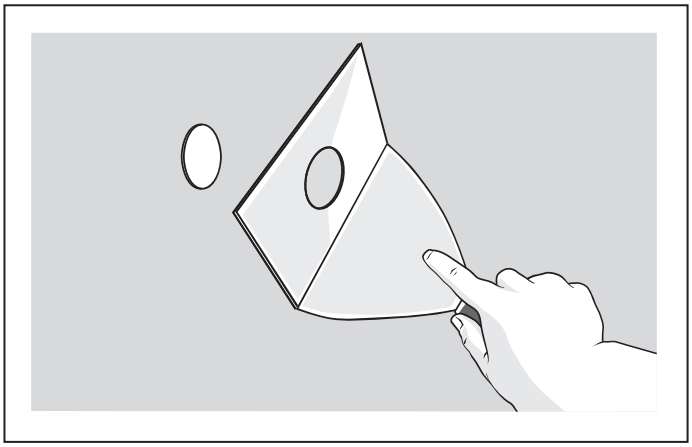


FIGURE 14 SCREW HEAD COVERED BY EPOXY AND JH BASE COAT

8. Sand James Hardie base coat smooth when cured with 100-120 grit sandpaper.

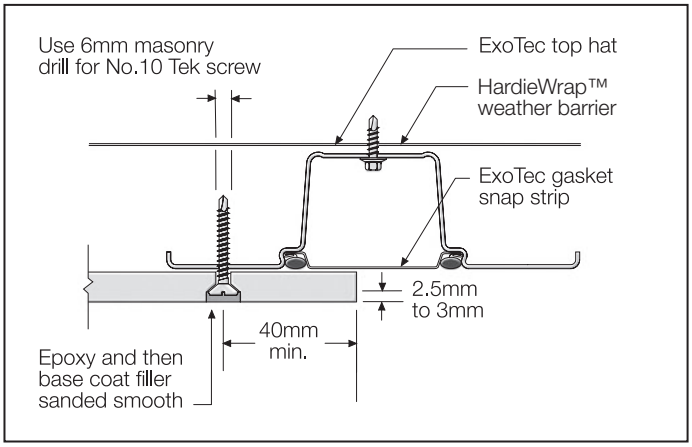


FIGURE 15 COUNTERSUNK FASTENER DETAIL

NOTE
Do not use hammer action.

Exposed Head Fasteners

1. Mark fastener locations as specified (see Figure 8).
2. Drill clearance holes for No.10 gauge screws using a 6mm masonry drill, which provides a 6.2 to 6.3mm diameter hole.
3. Fasten panel using corrosion resistant (minimum class 3) No. 10 gauge x 25mm pan, wafer or hex head self drilling screw into top hat. For areas within a corrosive environment, refer to fastener manufacturer for suitability and compatibility of fasteners and relevant standard.
4. For exposed head fasteners, ExoTec facade washers are recommended to be inserted between the panel and the fastener.

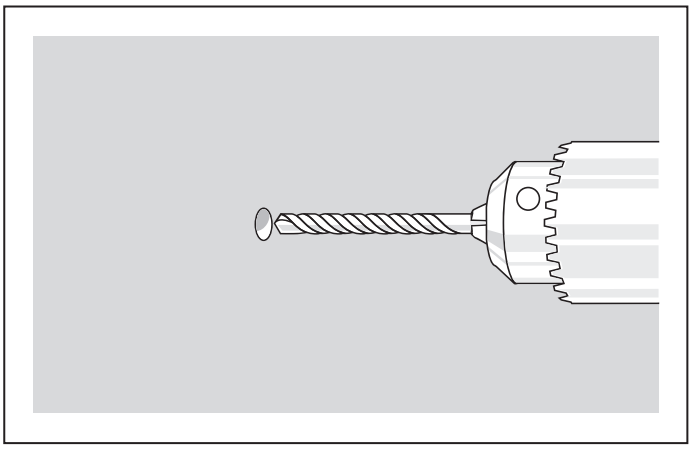


FIGURE 16 DRILL CLEARANCE HOLE

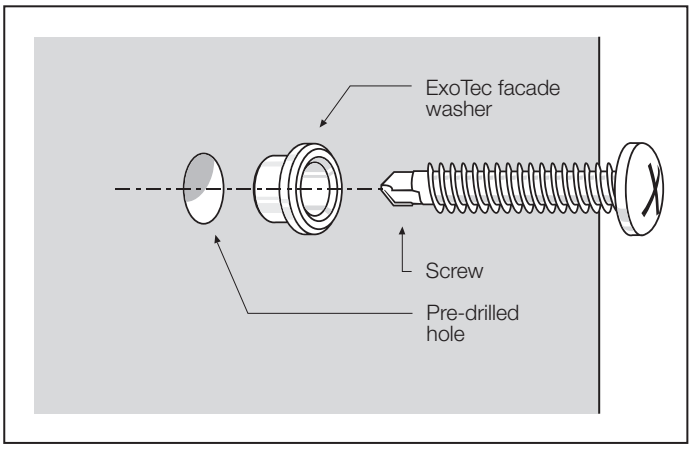


FIGURE 17 WASHER AND SCREW INSTALLATION

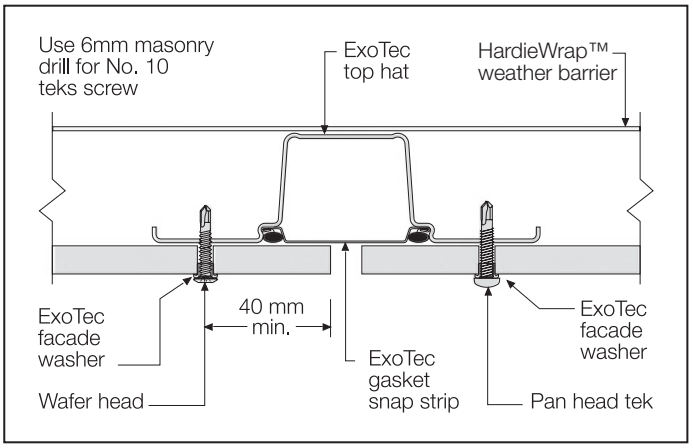


FIGURE 18 EXPOSED HEAD FASTENER DETAIL

BACKING STRIP INSTALLATION

At horizontal panel joints, ExoTec backing strips are adhered along the back top edge of the ExoTec facade panel prior to panel installation.

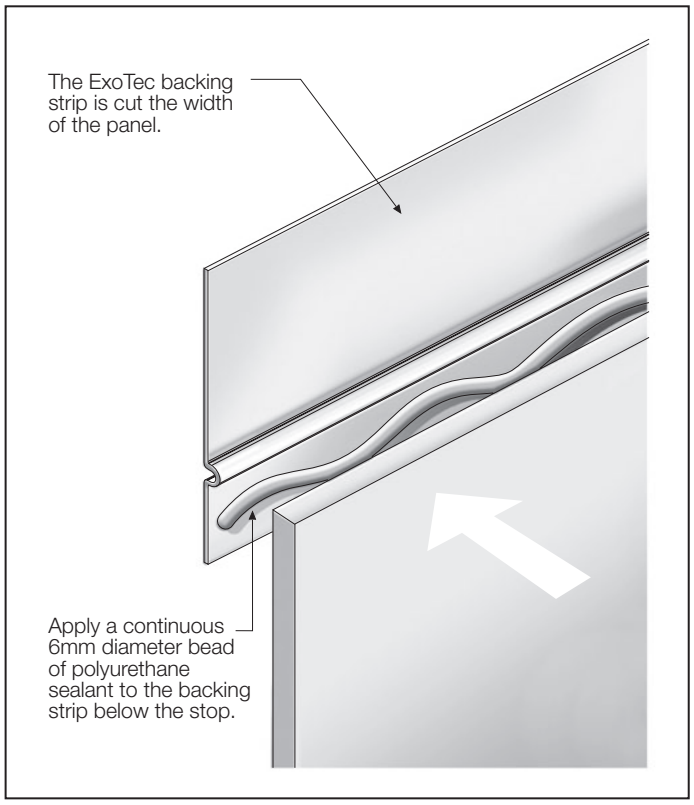


FIGURE 19 APPLYING SEALANT TO EXOTEC BACKING STRIP

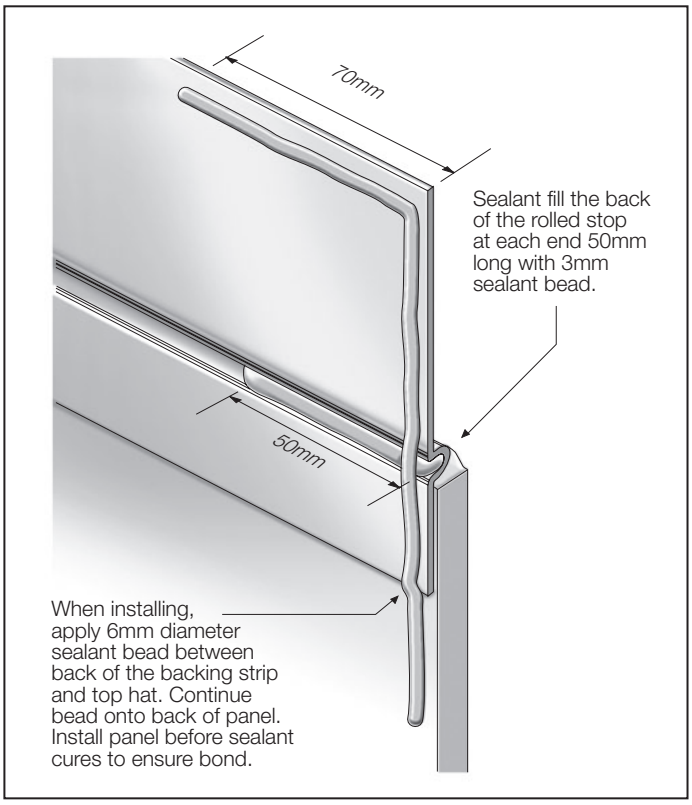


FIGURE 21 SEALING EXOTEC BACKING STRIP END DETAIL

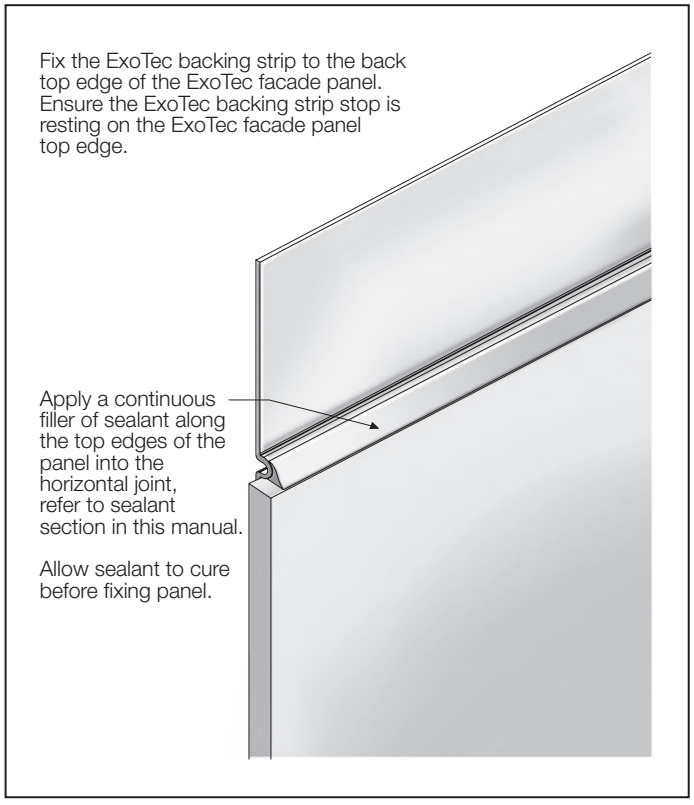


FIGURE 20 APPLYING SEALANT TO HORIZONTAL JOINT

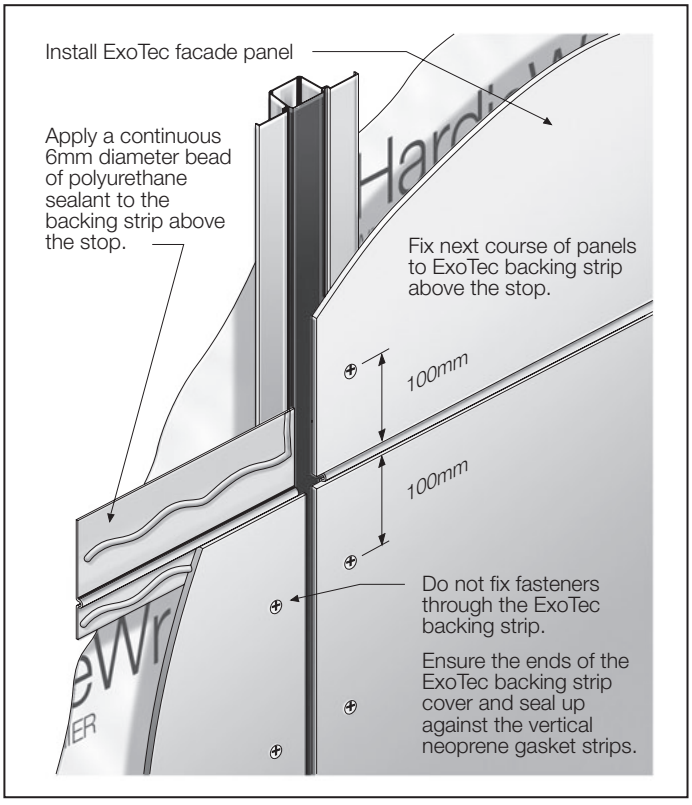


FIGURE 22 INSTALLING NEXT COURSE OF PANELS DETAILS

8 MOVEMENT JOINTS

SEALANT FILLED JOINTS

For design wind pressures including and above 4.0kPa, all horizontal and vertical joints must be continuously sealed over bond breaker tape.

Where joints are required to be sealant filled, James Hardie Joint sealant and Bostik Seal 'n' flex are recommended. Where vertical joints are sealed, a bond breaker tape must be installed behind the sealant.

CURVED FACADES

The ExoTec facade panel and fixing system can be used to follow curved walls as described below:

For radii 10m or greater

Use 9mm thick ExoTec facade panels which can be easily bent to the curve of the frame. ExoTec facade panels are to be fixed in a horizontal orientation only. Refer to Table 4 for maximum top hat spacing.

TABLE 4

MAX. TOP HAT SPACING FOR VARIOUS RADII

RADII (m)	MAX. TOP HAT SPACING (mm)	
	900mm wide panels	1200mm wide panels
10 to 15	300	400
>15	450	To suit wind loading

NOTES

1. The closer the spacing of top hats, the less likely they will read through as facets in the panels, particularly at a small radii.
2. 9mm thick panels may be able to be curved to a smaller radius, but this is likely to overstress panels.

NOTE

When fixing curved sheets, commence fixing from the centre and work outwards to avoid "drumminess".

Particular care should be taken when curving panels to ensure the supports are on a true curve. If not, apart from poor appearance, there is a risk of locally over-stressing the panels and causing cracking.

Alternate materials and installation methods are available for radii less than specified above including, glass reinforced cement (GRC) installed according to manufacturer's specifications.

For further information on curved facades contact Ask James Hardie™ on 13 11 03.

Movement joints are required to limit or remove stresses from the panels. Movement joints are provided by the nominal 10mm expressed or sealant filled joints at the perimeter of the panels.

Vertical structural joints may be required in the cladding to coincide with structural joints in the structure to accommodate the anticipated movement.

Horizontal structural joints are required at slab level where the framing supporting the top hats moves with the creep deflection in the slab.

For details of abutment to masonry walls, refer page 7 in the ExoTec facade panel and fixing system Technical Specification.

For more information on movement joints, refer page 6 in the ExoTec facade panel and fixing system Technical Specification.

NOTE

The project engineer is responsible for specifying the anticipated movement.

9 JUNCTIONS

All the following CAD details are available at ACCEL™ www.accel.com.au.

BASE SLAB JUNCTION

This junction can be treated in a number of ways, two of which are illustrated in Figures 23 and 25.

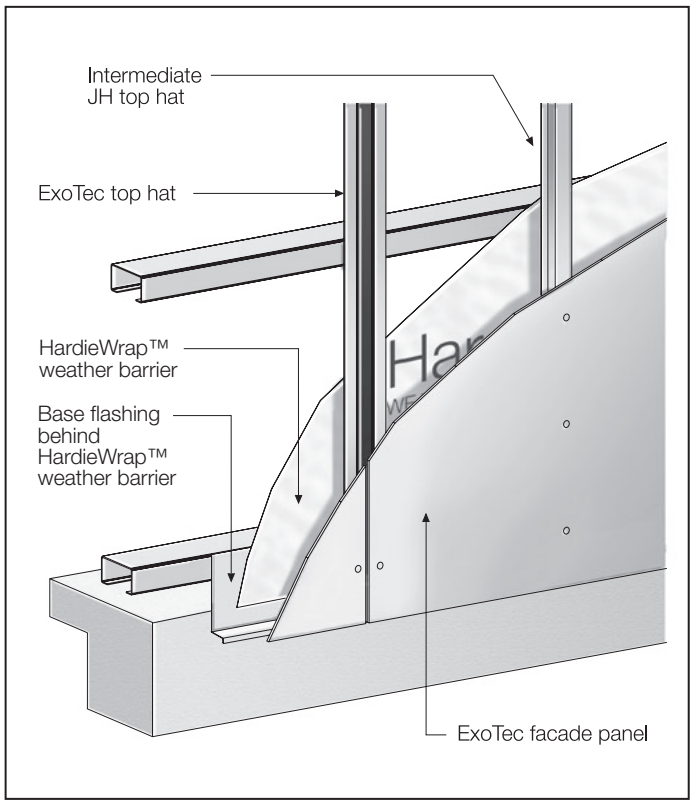


FIGURE 23 WALL BASE TYPICAL CUTAWAY DETAIL 1

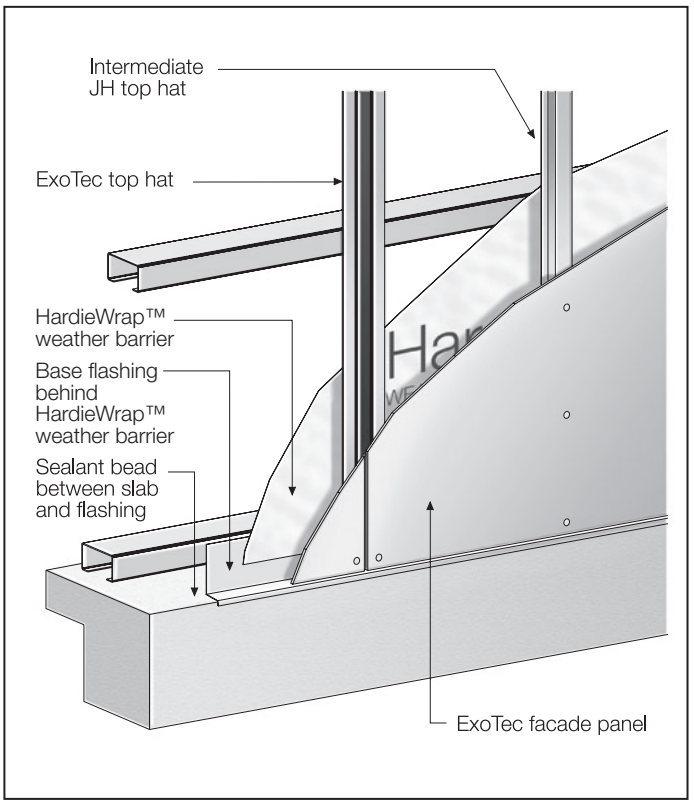


FIGURE 25 WALL BASE CUTAWAY TYPICAL DETAIL 2

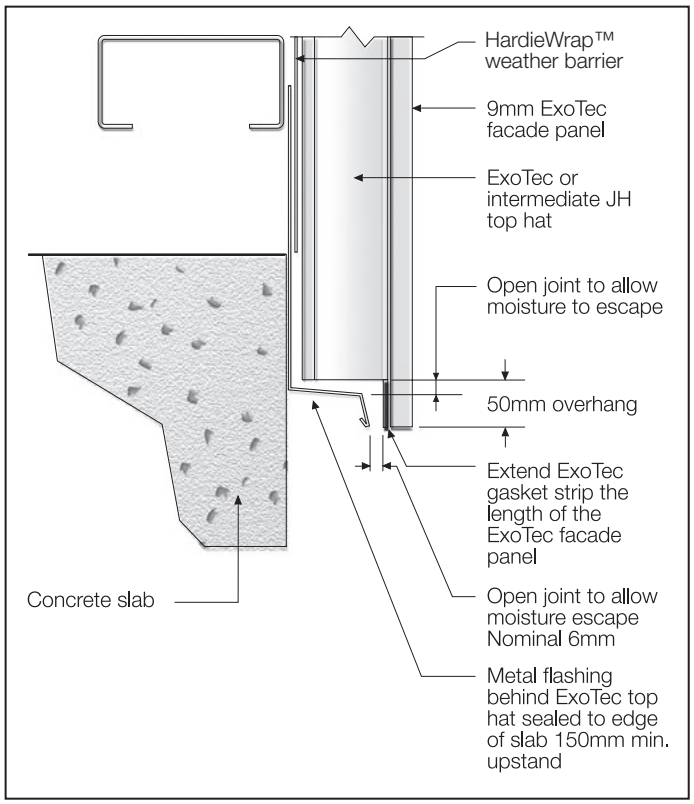


FIGURE 24 WALL BASE TYPICAL DETAIL 1

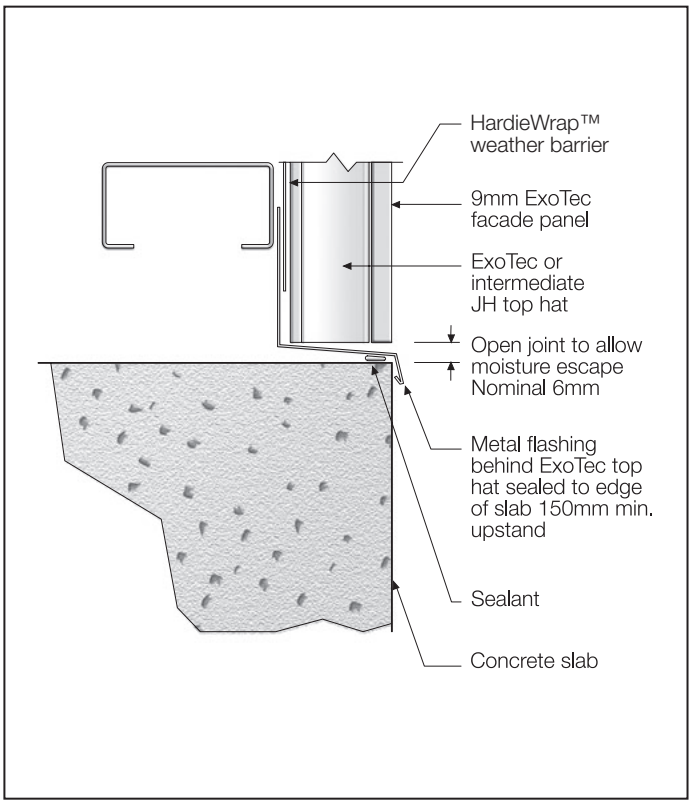


FIGURE 26 WALL BASE TYPICAL DETAIL 2

HEAD SLAB JUNCTION

Where the cladding forms a junction with an exposed slab, the detail must accommodate for slab deflection. Refer to the structural engineer for appropriate recommendations. A typical deflection head detail is shown in Figure 27.

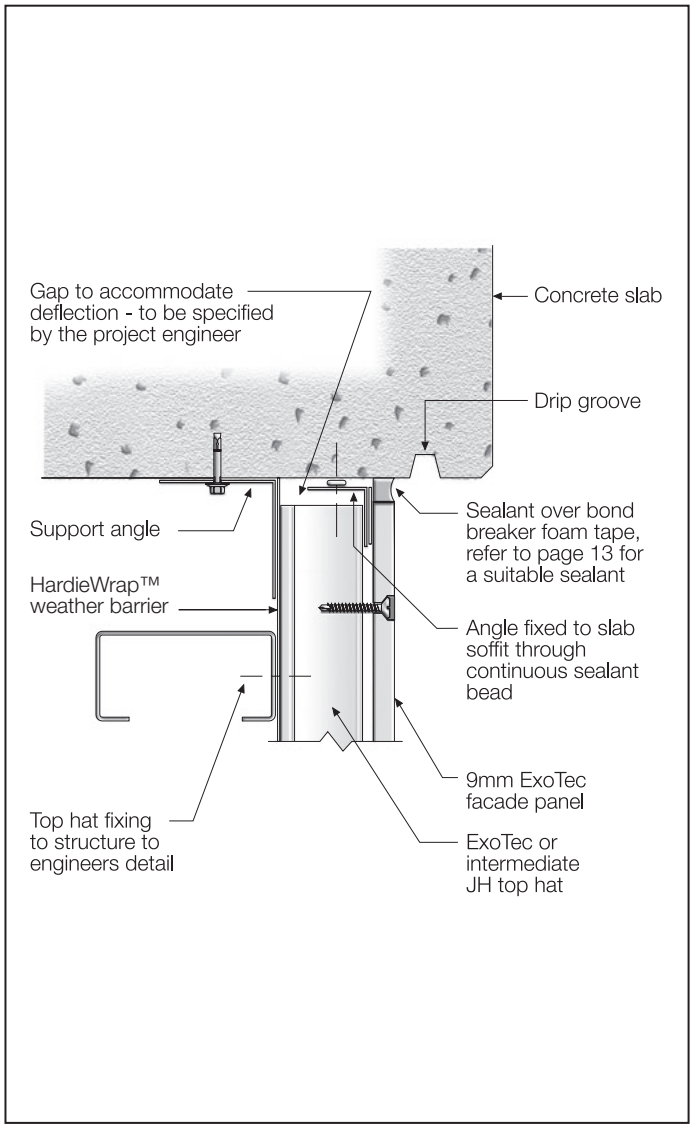


FIGURE 27 WALL DEFLECTION HEAD USED UNDER SLAB

SOFFIT JUNCTION

There are many ways of detailing the soffit junction and it is important to ensure that a drip edge is provided. A typical approach to install the soffit fascia junction is shown in Figure 28. Ensure the ExoTec gasket snap strip is installed to the bottom of the fascia panel.

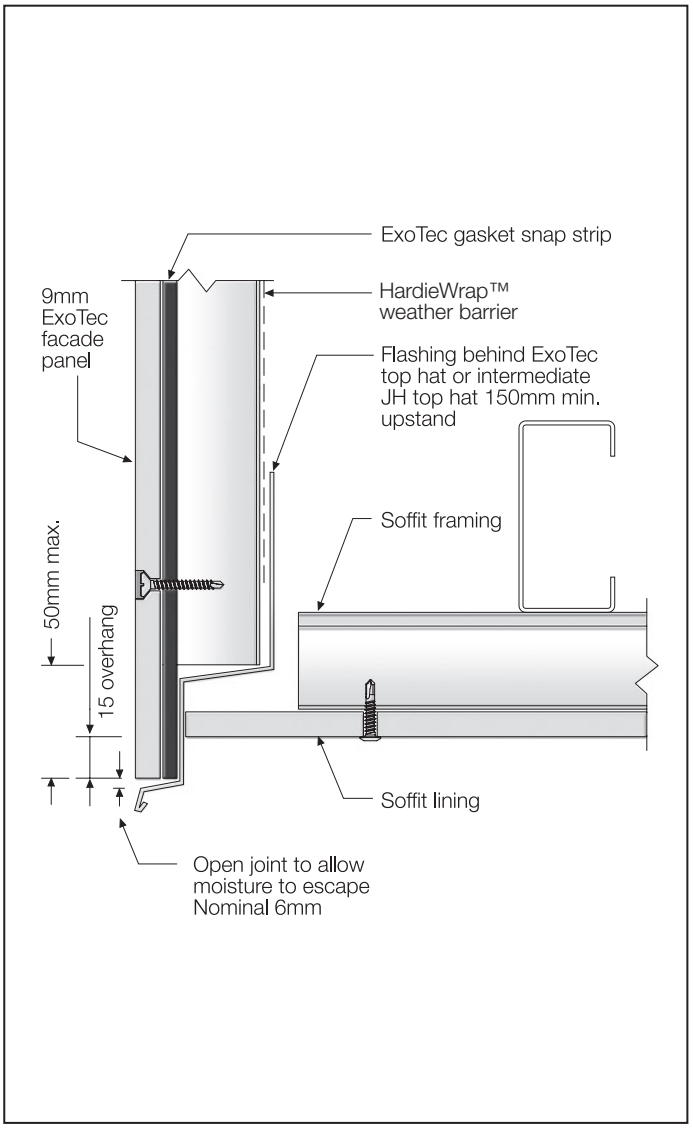


FIGURE 28 TYPICAL SOFFIT DETAIL

NOTE

It is essential that a continuous flashing is provided behind the top hats at the base of the fascia to allow moisture to escape. See Table 5 of the ExoTec facade panel and fixing system Technical Specification for required height of the flashing upstand.

10 EXTERNAL CORNERS

This section contains various methods of finishing external corners using the ExoTec facade panel and fixing system

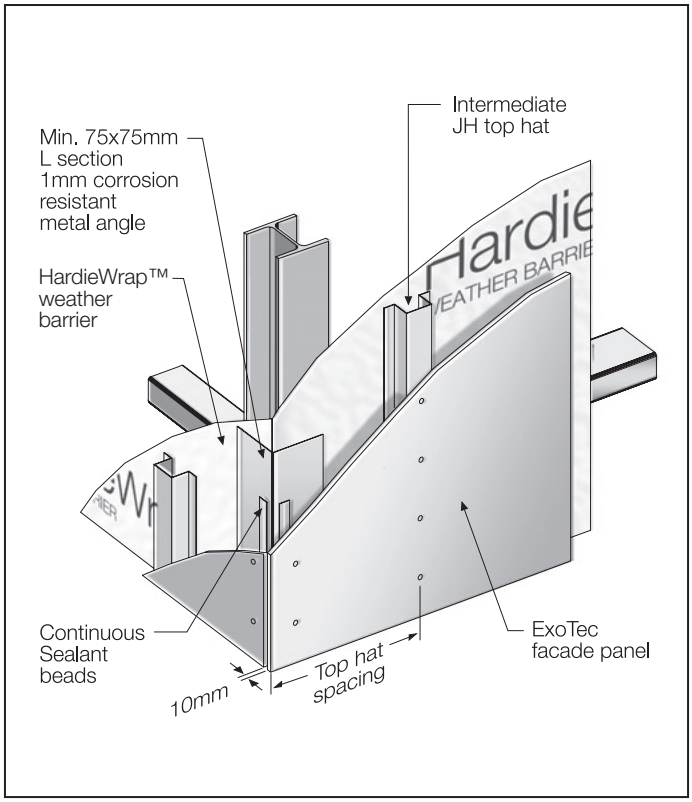


FIGURE 29 EXTERNAL CORNER CUTAWAY DETAIL

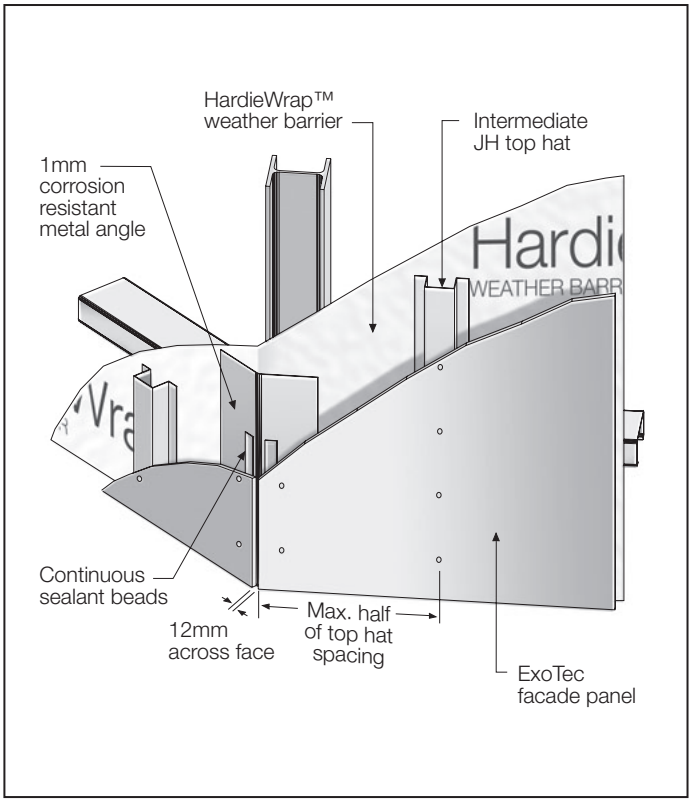


FIGURE 31 NON SQUARE EXTERNAL CUTAWAY CORNER

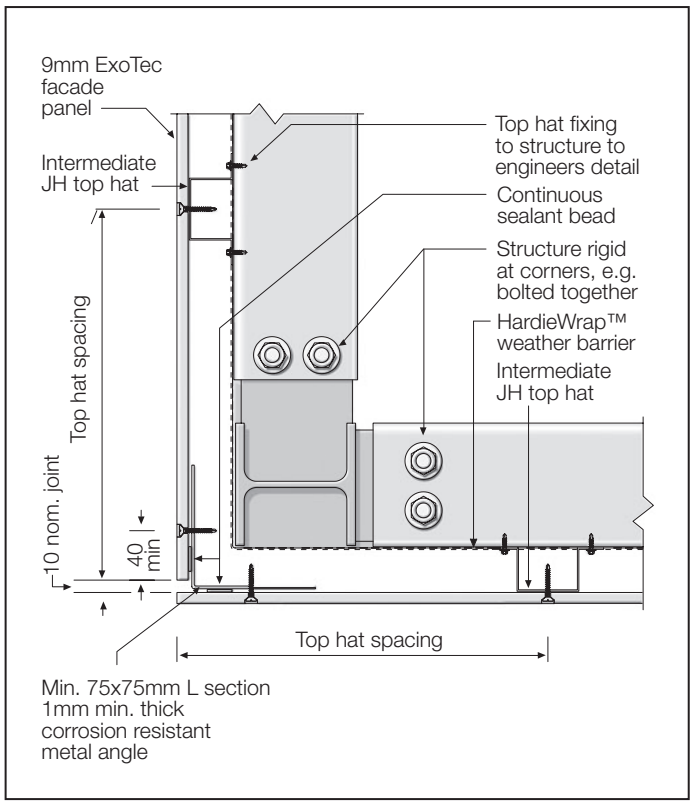


FIGURE 30 EXTERNAL CORNER DETAIL

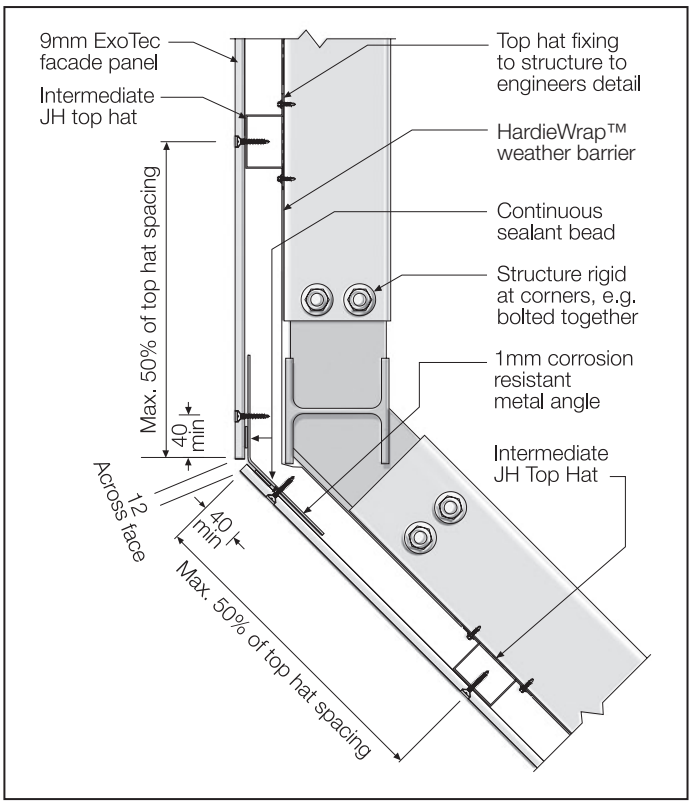


FIGURE 32 NON SQUARE EXTERNAL CORNER

11 INTERNAL CORNERS

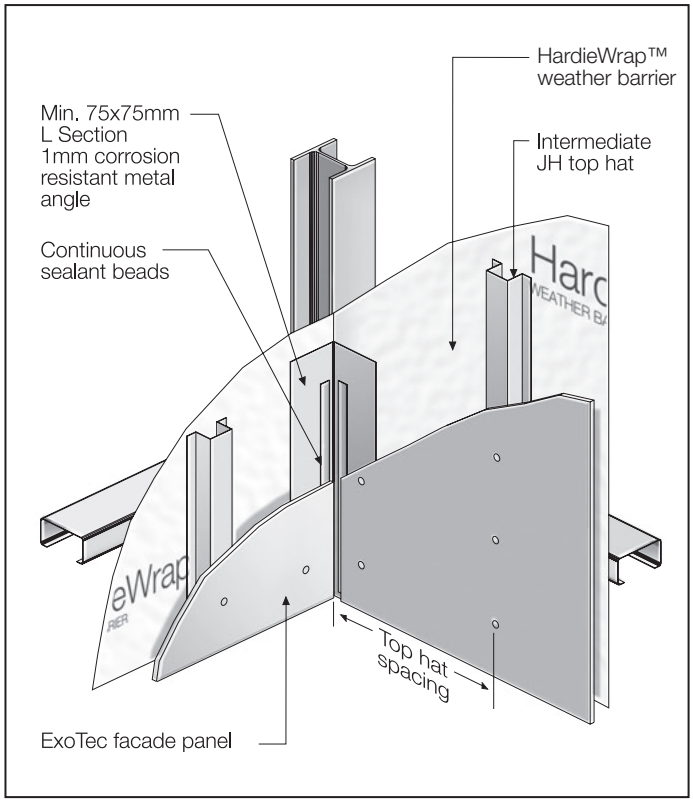


FIGURE 33 INTERNAL CORNER CUTAWAY DETAIL

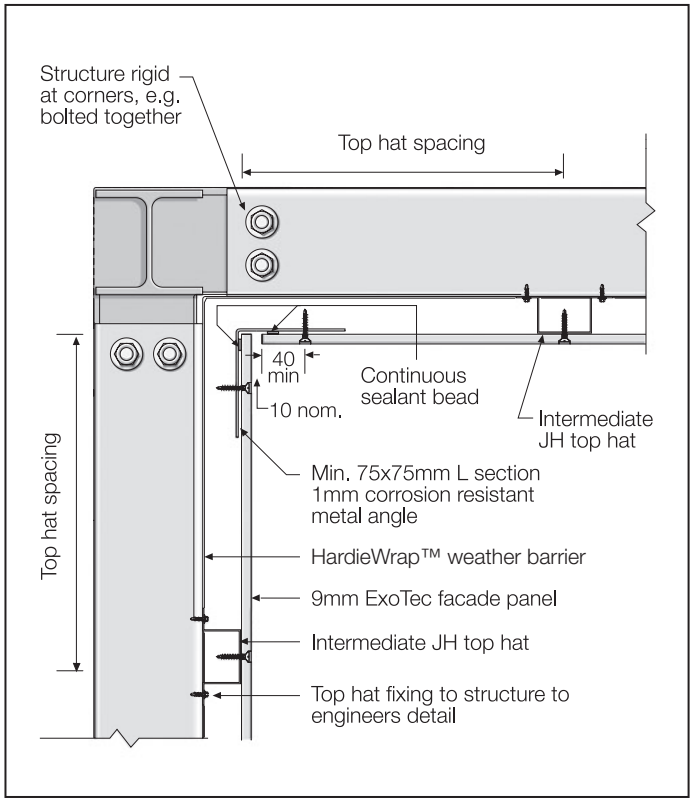


FIGURE 34 INTERNAL CORNER DETAIL

12 WINDOWS

The ExoTec facade panel and fixing system provides an opportunity to consider a range of alternative window treatments. The building designer, in conjunction with the window manufacturer, must consider the adequate weatherproofing of the window application.

Windows may be flush with the facade using figures 35– 45. This is a guide only. All windows are different and sufficient provision for moisture management must be made, see Clause 2.5 of the ExoTec facade panel and fixing system Technical Specification.

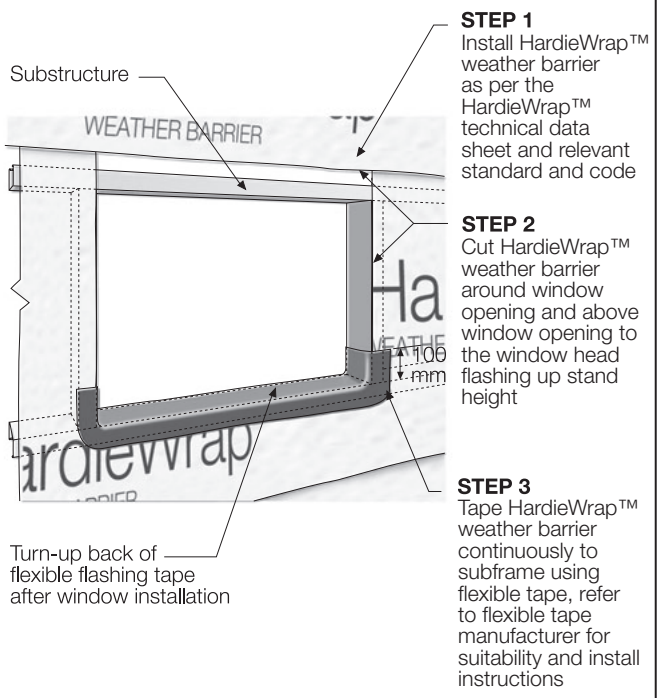


FIGURE 35 INSTALLATION OF HARDIEWRAP™ WEATHER BARRIER

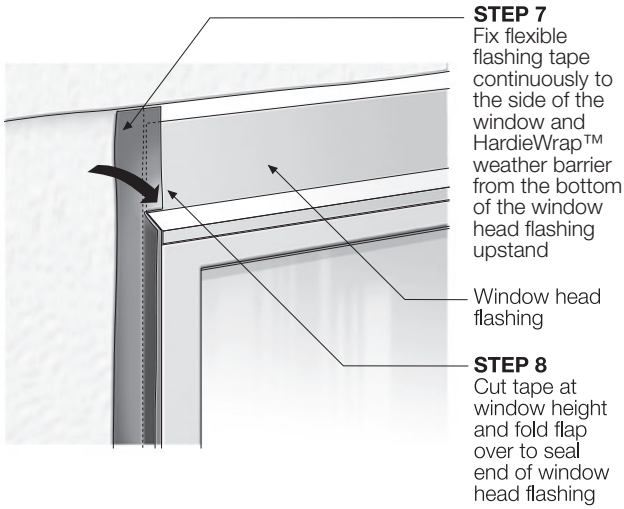


FIGURE 37 HEAD INSTALLATION OF WINDOW

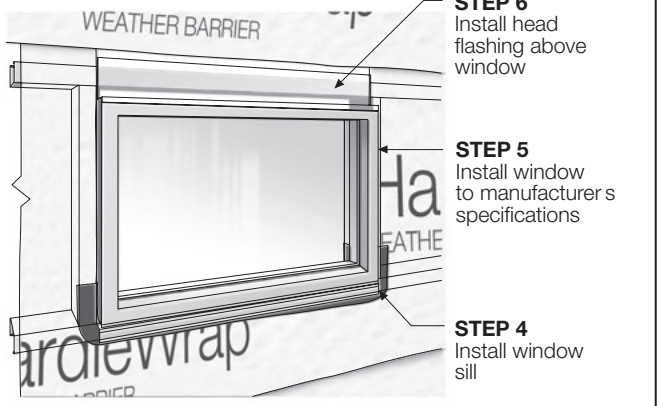


FIGURE 36 INSTALLATION OF WINDOW

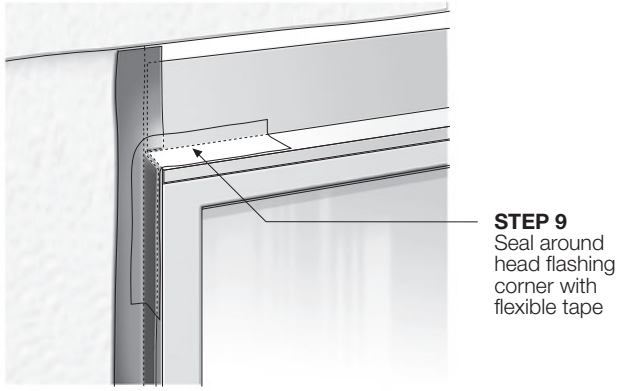


FIGURE 38 INSTALLATION OF WINDOW

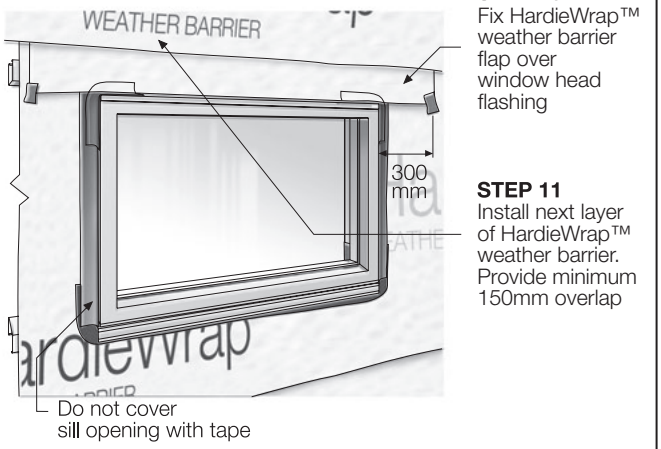


FIGURE 39 PREPARATION AROUND WINDOW

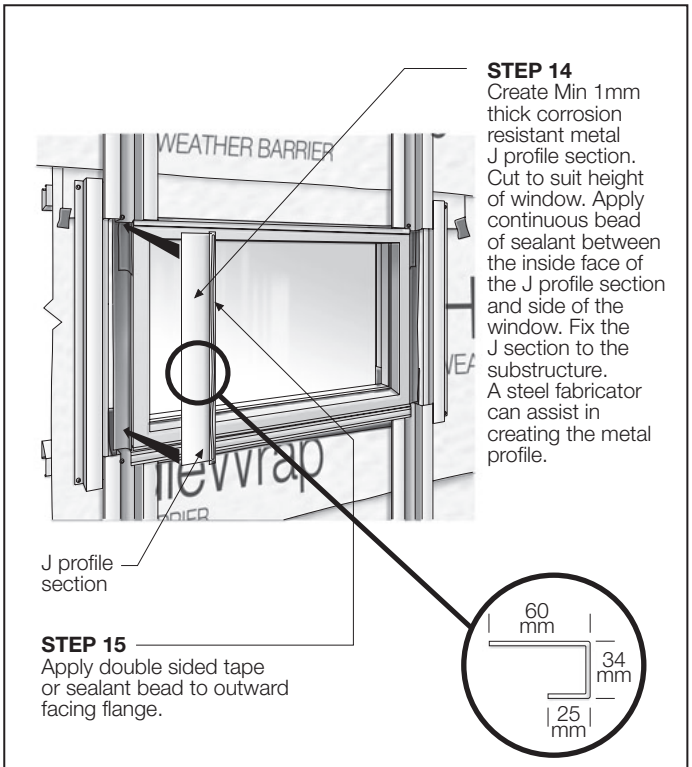


FIGURE 41 INSTALLATION OF J SECTION

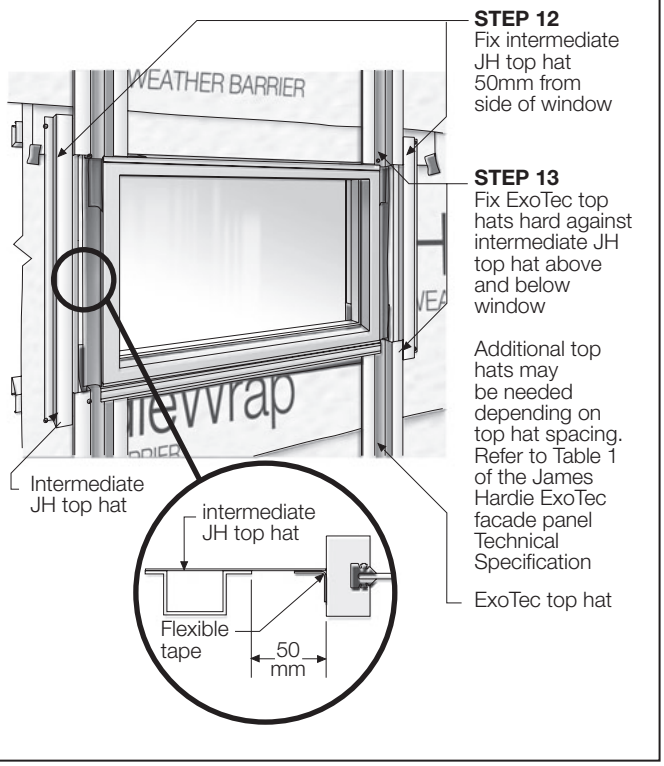


FIGURE 40 INSTALLATION OF TOP HATS AROUND WINDOW

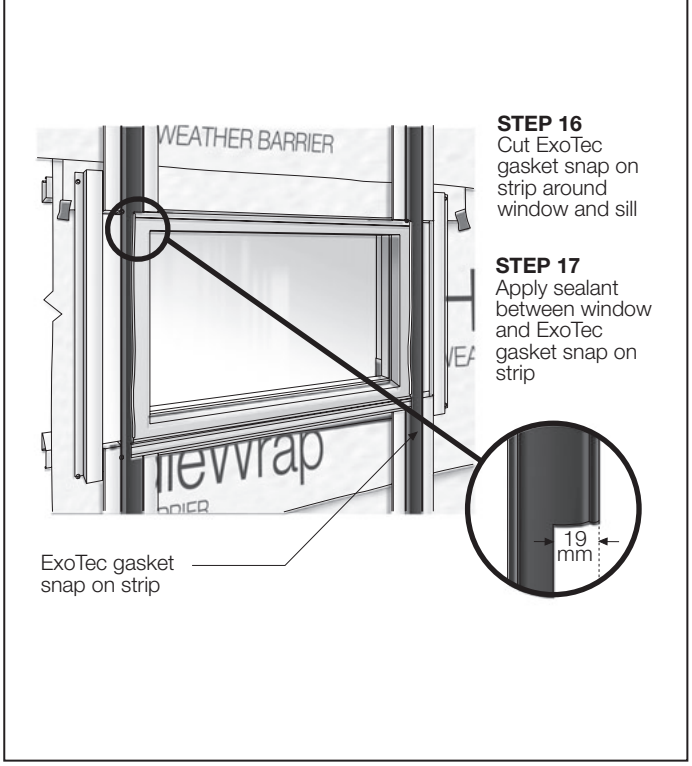


FIGURE 42 INSTALLATION OF SNAP ON STRIP

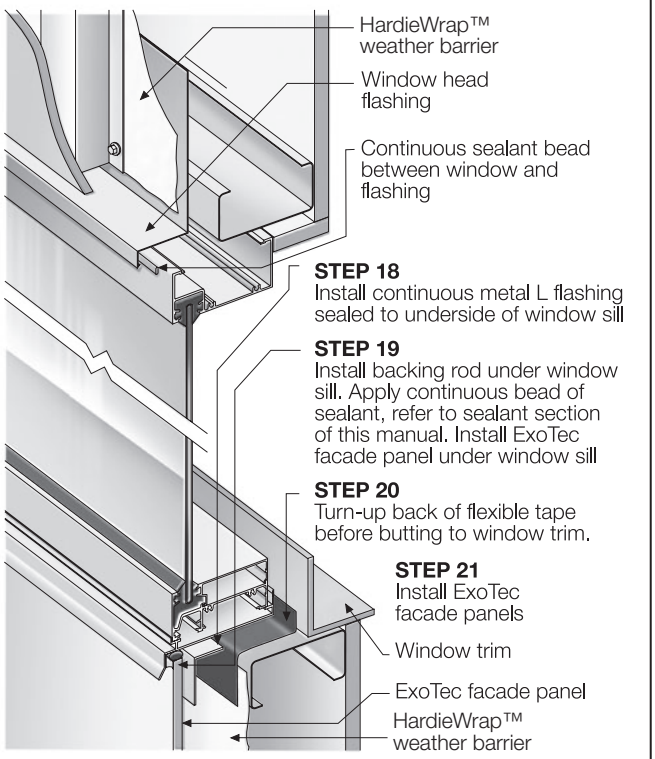


FIGURE 43 OVERVIEW CUTAWAY SECTION OF WINDOW

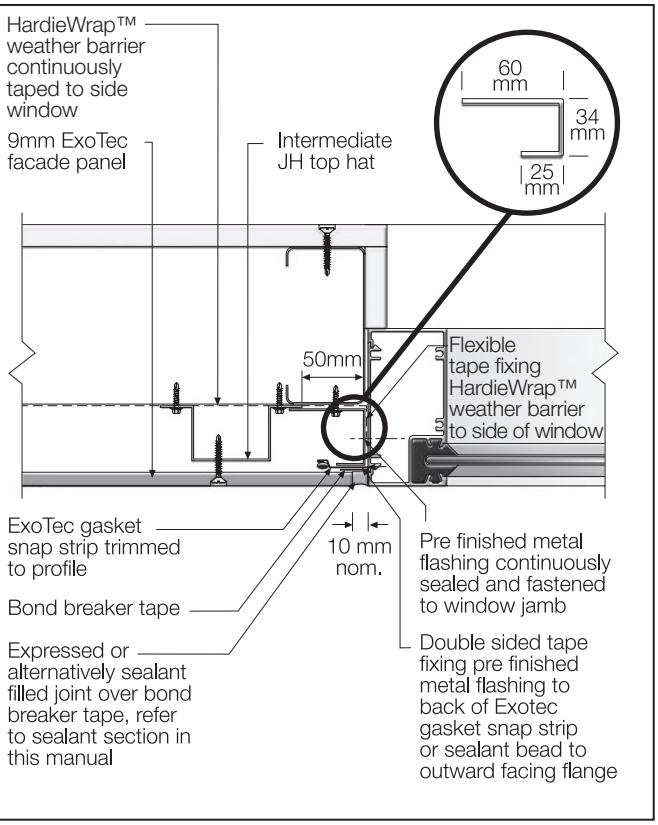


FIGURE 44 WINDOW JAMB DETAIL

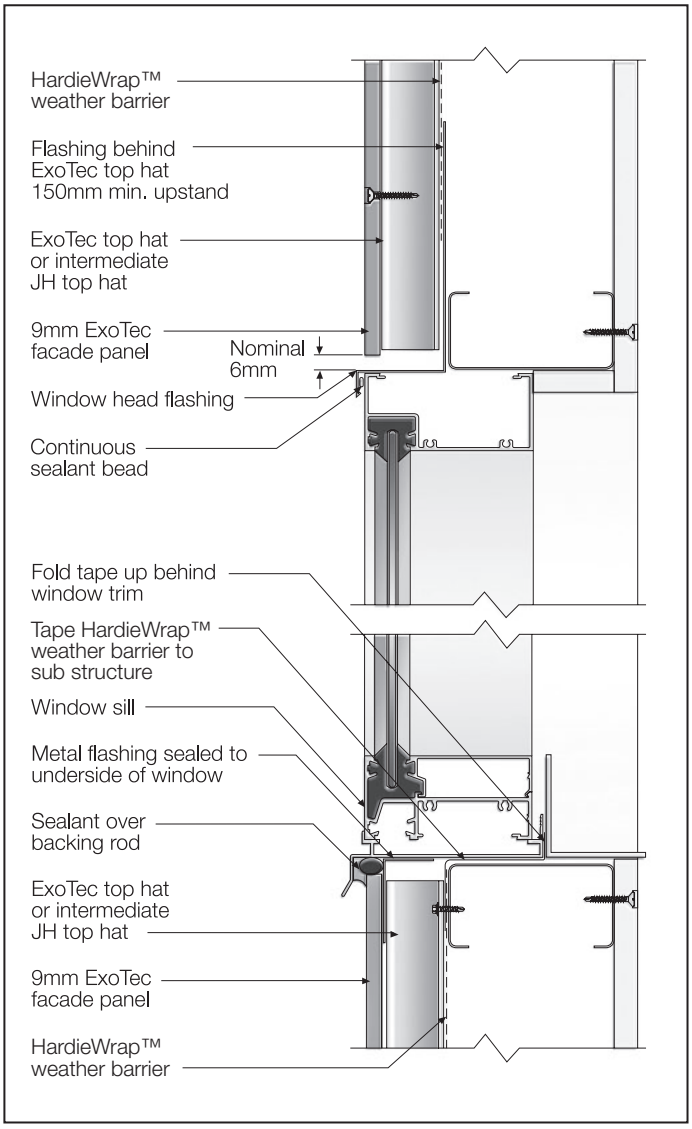


FIGURE 45 CROSS SECTION OF WINDOW

13 PARAPET DETAILS

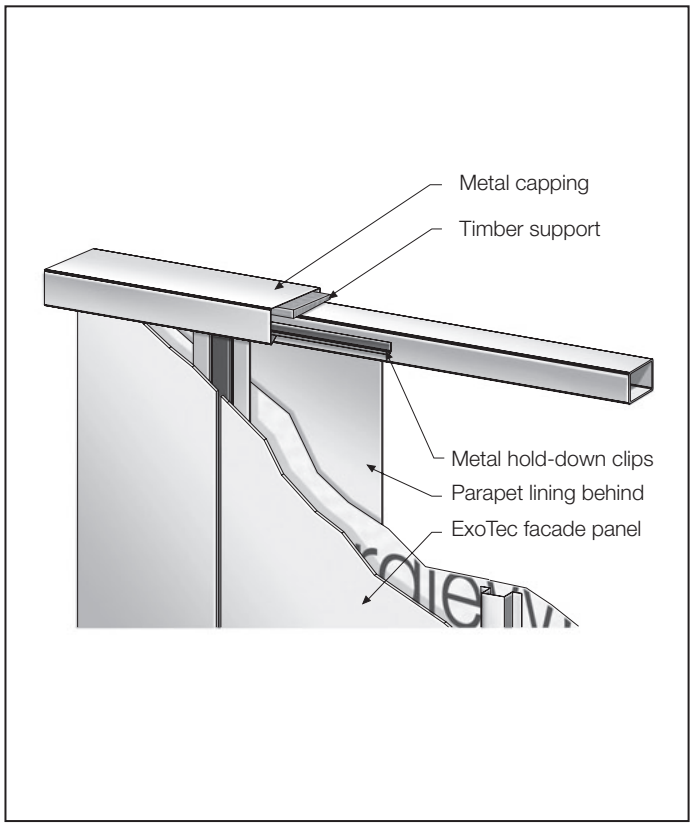


FIGURE 46 PARAPET CAPPING CUTAWAY DETAIL 1

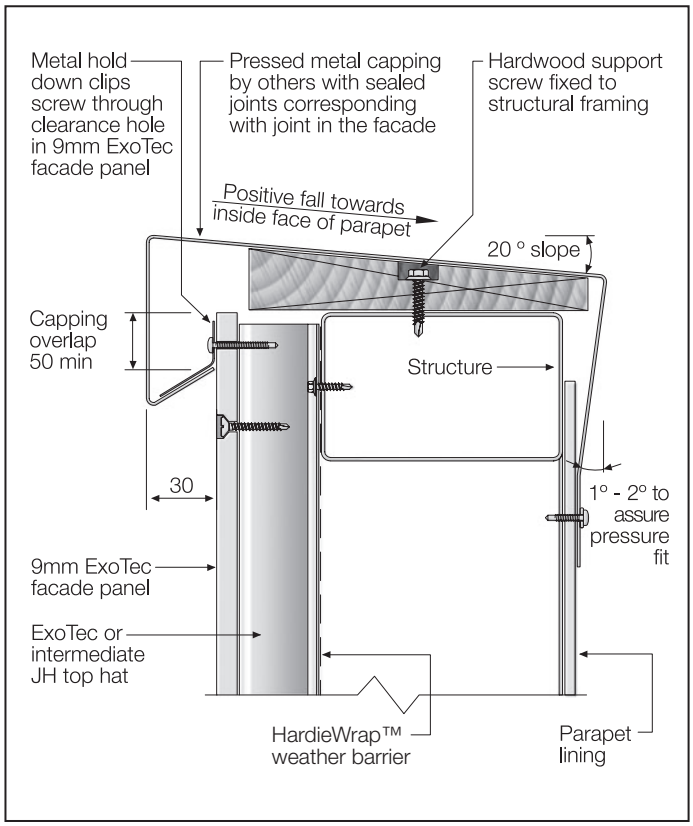


FIGURE 47 PARAPET CAPPING DETAIL 1

14 FINISHING

GENERAL

ExoTec facade panels will readily accept a wide variety of applied finishes, including site-applied textures and factory finishes.

For site-applied finishes (acrylic coatings), follow the paint manufacturer's recommended advice to adequately cover the sanded smooth James Hardie base coat filler applied over the epoxy filled concealed fixings (refer to fixing section).

In order to seal cut edges or sanded patches two coats of an appropriate primer should be applied at the time of cutting or sanding e.g. Dulux AcraPrime 501/1 (water based).

The face and edges of the panels must be coated in accordance with the paint manufacturer's recommendations.

For further information contact the service centre of the relevant paint company, as follows:

- Dulux Trade Customer Service on 13 23 77
- Taubmans Customer Service on 13 16 86
- Wattyl Hotline on 13 21 01

Polyurethane paints are not suitable as a site-applied finish but can be factory coated prior to installation. Pre-finished panels are generally installed using exposed head fasteners

Some environments require special coatings. Painting selection and specifications are dependant on the paint chosen.
Refer to the paint manufacturer.

Fixing tiles onto ExoTec facade panels is not recommended.

PANELS EXPOSED TO DIRECT SUNLIGHT

The face or rear of the panels must not be exposed to direct sunlight for any period greater than three months. The face must be over-coated as recommended by the paint companies mentioned above. However, if the rear clear sealer is exposed to direct sunlight by its application, e.g. fascias, plantrooms, etc., then the clear sealer must be coated with a minimum of two coats of an exterior grade acrylic, pigmented white, with a minimum of 10 years warranty, by one of the paint companies previously mentioned.

It is the responsibility of the specifier to identify other weather related risks with any particular building design.

NOTE
Refer to the previously mentioned paint companies for suitable rear face surface preparation on the ExoTec facade panels.

15 MAINTENANCE

It is the responsibility of the specifier to determine normal maintenance requirements.

The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- In coastal areas, a six monthly washdown of expressed joints must be done as per Clause 2.4. in the current ExoTec facade panel and fixing system Technical Specification.
- Annual checks and maintenance for the exposed sealant (3mm fillet at horizontal joints, filled vertical and horizontal joints) referenced in Clauses 6.2, 6.3, 6.4, 6.5, 6.6, 7.1, 9, 11.1 and 11.2, must be done as required by the sealant manufacturer, refer to the current ExoTec facade panel and fixing system Technical Specification.
- Maintenance to painted surfaces must be carried in accordance with the paint manufacturer's specification, refer to section 14 in this manual.
- As required, clear debris build up against ExoTec facade panels.
- Maintain sealant as per manufacturer recommendations, to ensure weather seal.
- Clean out gutters, blocked pipes and overflows as required.

16 WARRANTY

ExoTec® facade panel and fixing system

10 YEAR WARRANTY

January 2012
James Hardie Australia Pty Limited ("James Hardie") warrants to the first purchaser of ExoTec® facade panel **(Product)** from James Hardie and the last purchaser of the Product prior to installation that, subject to compliance with the Conditions of Warranty below:

- for a period of 10 years from the date of purchase, the Product will be free from defects due to defective factory workmanship or materials; and
- for a period of 10 years from the date of purchase, the Product will be resistant to damage from cracking, moisture, rotting, fire and termites to the extent set out in James Hardie's relevant published literature current at the time of installation; and
- for a period of 12 months from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

For the purposes of this warranty, a "defect" in respect of the Product means a non-compliance with AS/NZS 2908.2:2000 Cellulose-cement products - Flat sheet.

CONDITIONS OF WARRANTY
This warranty is strictly subject to the following conditions:

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

(b) the Product is subject to natural variation in finish as part of the manufacturing process. The builder/installer must ensure the Product meets aesthetic requirements before installation. Subject to the terms of this warranty, after installation of the Product, James Hardie is not liable for claims arising from aesthetic surface variations if such variations were, or would upon reasonable inspection have been, apparent prior to installation;

(c) this warranty cannot be relied upon by any other person and is not transferable;

(d) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. To obtain copies of such literature go to or contact Ask James Hardie™ on 13 11 03. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice;

(e) the project must be designed and constructed in strict compliance with all relevant provisions of the current Building Code of Australia, regulations and standards;

(f) if the claimant chooses to rely upon this warranty then the claimant's sole remedy under this warranty for breach of this warranty is (at James Hardie's option) that James Hardie will either supply replacement Product, rectify the affected Product or pay for the cost of the replacement or rectification of the affected Product;

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

(h) In the circumstances where the Australian Consumer Law does not apply in respect of the purchase of the Product, all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;

(i) If meeting a claim under this warranty involves re-coating of Product, there may be slight colour differences between the original and replacement Product due to the effects of weathering and variations in materials over time and James Hardie is not liable for any such colour differences;

(j) In the circumstances where the Australian Consumer Law does not apply in respect of the purchase of the Product and therefore to this warranty, all expenses incurred as a result of claiming under this warranty are to be borne by the claimant.

(k) In the circumstances where the Australian Consumer Law does apply in respect of the purchase of the Product and therefore to this warranty, if James Hardie accepts or it is determined by James Hardie that the claimant has a valid claim under this warranty, James Hardie will bear the claimant's reasonable costs of claiming under this warranty. The claimant is responsible for all other costs of claiming under this warranty. All claims for such costs are to be notified to James Hardie at the address outlined below within 21 days from when the claimant first makes a claim under this warranty.

DISCLAIMER
The recommendations in James Hardie's literature are based on good building practice but are not an exhaustive statement of all relevant information and are subject to conditions (d), (e), (g) and (h) above. Further, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design), James Hardie shall not be liable for the recommendations in that literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code of Australia, regulations and standards.

IMPORTANT NOTE
If you acquire goods manufactured by James Hardie as a consumer according to the Australian Consumer Law, our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Any rights a consumer may have under this warranty are in addition to other rights and remedies of a consumer under a law in relation to the goods to which this warranty relates. Nothing in this document shall exclude or modify any legal rights a customer may have under the Australian Consumer Law or otherwise which cannot be excluded or modified at law.

Contact details if you wish to make a claim under this warranty: For more information or to make a claim under this warranty please Ask James Hardie™ on 13 11 03, visit www.jameshardie.com.au or www.accel.com.au, email James Hardie via our website or write to James Hardie at:
James Hardie Australia Pty Ltd
10 Colquhoun Street Rosehill NSW 2142
PO Box 70 Parramatta NSW 2124

Ask James Hardie™

Call 13 11 03

www.jameshardie.com.au

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EQUITONE

Fibre cement facade materials

INSTALLATION GUIDE

AUSTRALIA

www.equitone.com

Contents

About EQUITONE

EQUITONE is the world's leading architectural facade material. EQUITONE evokes the unique characteristics of fibre cement. Fibre cement is a mineral composite with outstanding physical and aesthetic properties. Our company has led development and innovation of this versatile architectural building board for more than a century, under different brands names such as "Eternit". Today, EQUITONE is manufactured in state-of-the-art facilities in Germany and Belgium.

This guide illustrates that installation of the EQUITONE range of fibre cement panels is relatively simple and convenient, provided some simple rules are followed.

The information in this guide is comprehensive but not exhaustive. More information is available through the experienced and knowledgeable EQUITONE service teams.

All design and construction of facade systems must be in strict accordance with the latest version of Building Code of Australia standards and regulations.

As an installer of this material it is important to note that the panels are pre-finished. Professional care and attention is therefore needed to ensure an acceptable level of installation is consistently achieved.

Ventilated facade

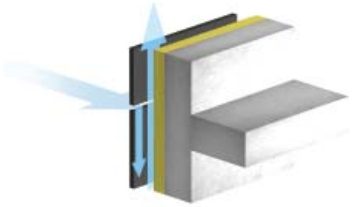
A ventilated facade is a kind of two stage construction, an inner structure with a protective outer skin, the cladding panel. This skin protects the structure against the elements. A ventilated facade is ideal for use in both new buildings and renovation projects.

The key features of a ventilated facade are:

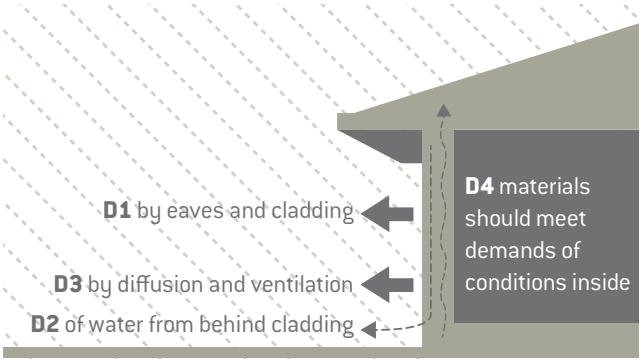
- an outer skin of panels,
- an air gap or cavity, and
- an insulated backing wall that controls air leakage.

The panel shields the backing wall from the weather. However, depending on the nature of the joints between panels, some water penetration may occur. The air gap and airtight backing wall combine to limit this penetration. The cavity space can evaporate and/or drain moisture away safely. Therefore, providing a secondary line of defence against the elements. See page 24 for more information.

Drained and ventilated principle



Drained and ventilated systems are provided with openings at the top and bottom of the wall. These provide both ventilation and an effective drainage route. This combination allows air to circulate and dry the cavity between the inner and outer skins.



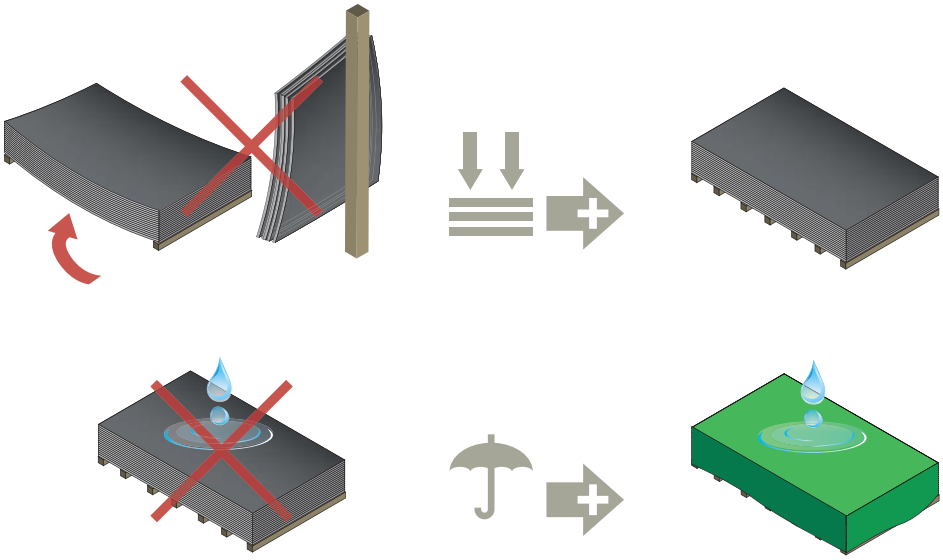
D1 Check claddings and flashings for deflection (aim to keep water out).
D2 Arrange for drainage to channel outside (if water gets in).
D3 Arrange for ventilation and vapour diffusion drying (to eliminate remaining water).
D4 Choose components that are durable for prevalent conditions (and avoid damage during drying process).

Health and safety

All EQUITONE panels have their own Material Safety Data Sheets. These MSDS outline common hazards associated with working with the panels and provide measures to minimise risk.

For more information, please refer to page 12. Material Safety Data Sheets are available upon request.

Storage



1. All panel materials must be stored flat on pallets, inside and undercover in dry conditions, protected from weather and potential influence of other trades.

2. Stack the pallets in a way so that the panels are ventilated.

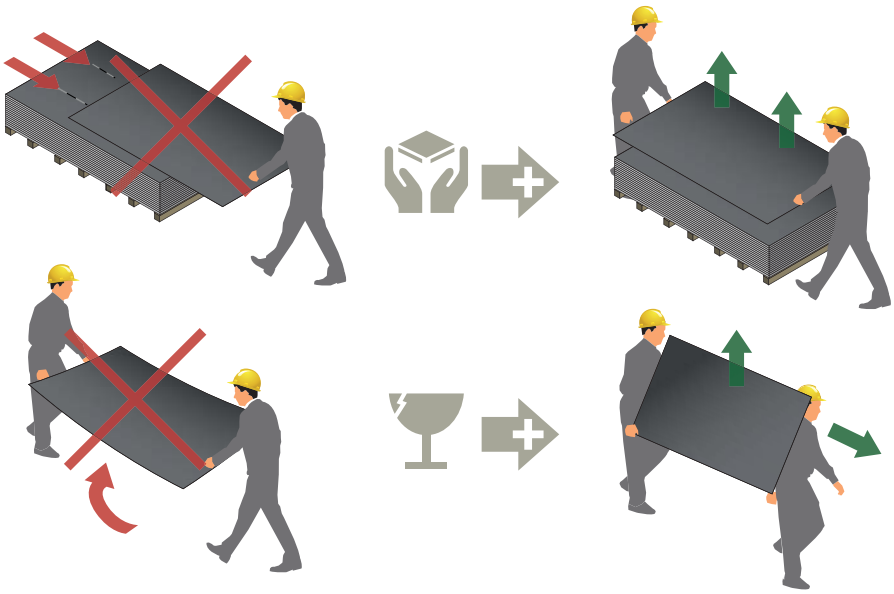
3. Do not deliver any panels to site which cannot be installed immediately or unloaded into a suitable well protected storage area.

4. Store products clear of the ground and on level bearers at a maximum of 600mm centres.

5. Individual stacks can be 500mm high, and not more than five stacks can be placed on top of one another.

NOTE: EQUITONE coated panels are supplied with protective paper between the decorated faces. This protection should not be removed. Stack the panels' front face or rear surface-to-rear surface. The panels should not be placed face-to-back.

Handling

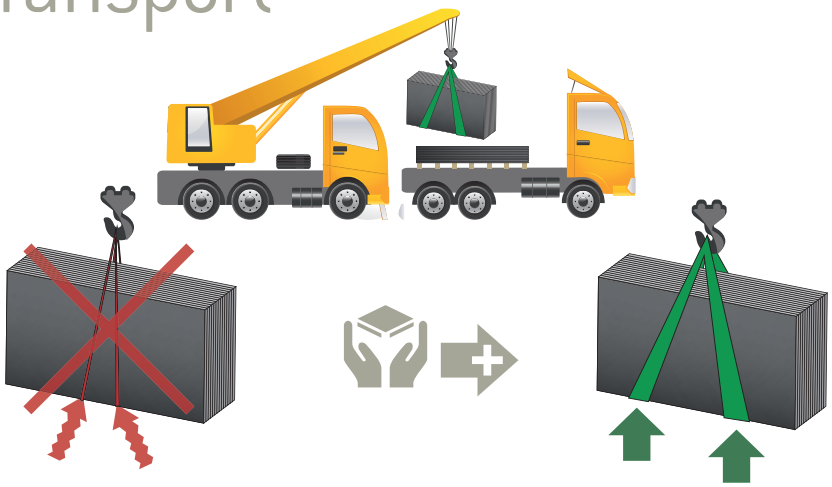


1. Always lift panels off each other, never slide them over one another, since scratching may occur.

2. To carry the panels, stand them on their back edge and lift with two people (one person at each end) protecting the face from scratching or damage.

NOTE: Always lean panel towards back edge to avoid damaging visible front edge. The use of soft bearers is helpful the rest the panel edge on and minimise possible damage.

Transport



1. Moving panels that are stacked on pallets should be done with a forklift or a crane.

2. Use wide lifting straps or forklift with wide arm setting.

Ensure panels are secured to pallet in a way that will not cause damage to panels. Stacks should be transported under a waterproof cover.

Centralising tool

This accessory fits any standard manual or electrical drill and is used with all EQUITONE panels which are to be fixed to a metal supporting frame.

The use of this tool ensures that the smaller rivet hole in the vertical profile is centered in the larger panel hole. This ensures the best allowance for any frame movement.

The tool has a guide that neatly fits into the panel hole. The drill bit then extends to drill the profile. The drill bits can be easily replaced at the end of their functional life.

Foam tape

Foam tape is used when fixing EQUITONE to metal support frames. It is a closed cell PVC foam tape and comes with a self-adhesive strip. The tape has a number of functions:

- It reduces moisture infiltration at vertical joints.
- It fills space between panel and rivet.
- Cushions panel against sudden impact.
- Allows additional flexing movement of the frame.
- There is space available for fitting horizontal joint profile or backing strips without causing panel distortion.
- It separates panel from metal frame, reducing risk of surface condensation forming on cool mornings.

Different widths of tape can be employed. Wider tapes also have the extra benefit of “blacking out” the vertical joint without needing to use additional tape or paint. Ensure tape is thick enough to provide an adequate seal.

EQUITONE Astro rivet

The stainless steel (quality A2, AISI 304) EQUITONE Astro rivet has a coloured head to match the panel and built-in spacer (cylinder).

The stainless steel spacer/ cylinder maintains a consistent gap between panel and metal frame, and allows total free movement of the panel. An uncoated rivet is also available.

Failure to use this rivet invalidates product warranty.

Rivet sleeve

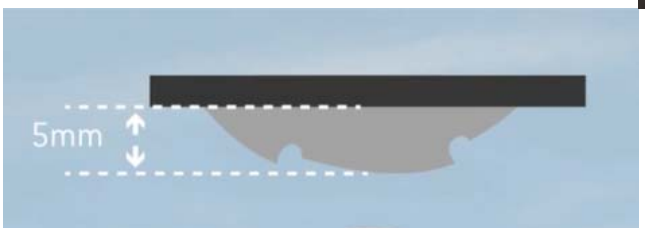
Rivet sleeves are used with rivets to form fixed points when fixing panels. The sleeve slides over rivet and fills the hole in the panel.

Panel cutting

As much pre-cutting of panels as possible should be accomplished off-site. In situations, where this is not possible – for reasons of time, geography or logistics, for example – on-site working can be achieved in a specially prepared area.

It is recommended that EQUITONE saw blades are employed to cut EQUITONE panels on and off-site. These blades are especially designed for fibre cement and when correctly used result in a high level of finish. The blade is unique with its minimal diamond tipped teeth which are shaped to give a tear-free edge. The EQUITONE blade's vibration damping composite body also assists in achieving optimum cut results.

Blade diameter	Blade thickness	Borehole	Number of teeth	Saw speed
160mm	3.2mm	20mm	4	4,000rpm
190mm	3.2mm	20mm	4	3,200rpm
225mm	3.2mm	30mm	6	2,800rpm
300mm	3.2mm	30mm	8	2,000rpm



EQUITONE blades remain good up to 5,000m of cutting if correct procedures are observed, including:

- panel faces down,
- panel is held firmly in place to minimise vibration,
- saw blade reaches 5mm below panel thickness,
- set correct speed relative to recommended saw blade size, and
- one panel is cut at one time.

Cutting curved cut-outs

Curved cut-outs also required special procedures. These include:

- panel must face down,
- drill hole in panel at edge of intended curved cut-out area,
- ensure jigsaw pendulum function is switched off, and
- insert Bosch T141HM jigsaw blade and proceed to cut.

NOTE: Poorly maintained cutting tools or incorrect saw speed as opposed to blade speed can result in localised heating/ burning of panel edges. Do not use grinder tools as these usually have a high cutting speed. This produces higher than average pressure on panel edges. Most grinding tools also produce excessive, unwanted dust.

Edge treatment

It is advisable to sand edges of panels after cutting panels to size. This reduces possibility of damage and improves panel edge appearance.

1. Use 80-grit sand paper.

2. Affix sheet of sand paper to a block of scrap wood or building board approximately 400mm x 100mm in size and use to sand edges.

Dust removal

Cutting or drilling creates dust which contains cement. If allowed to dry in, this dust can permanently stain the surface of the panels. Immediately after cutting or drilling, clean and dispose all dust particles in the recommended manner, as follows:

1. When dry, remove all dust with a micro-fibre or micro-soft clean cloth.

2. If dust is present on damp panels, remove dust with soft brush and plenty of water.

RECOMMENDATION: Do not drill panels when panels are positioned on facade as dust is likely to spread over large areas.

As with all products containing quartz, e.g. concrete and clay, when EQUITONE panels are machined mechanically (cutting, sanding, drilling) the released dust may contain quartz particles. Inhalation of high concentrations of dust may irritate the airways, and dust may also cause irritation of eyes and/or skin. Inhalation of dust containing quartz, especially fine (respirable size) particulate matter, in high concentrations over prolonged periods of time, can lead to lung disease (silicosis) and an increased risk of lung cancer.

1. Avoid dust inhalation with the use of cutting/sanding equipment fitted with dust extraction/ suppression accessories and wherever practical.

2. Ensure adequate ventilation of all work sites.

3. Avoid contact with eyes and skin by wearing an approved respirator (dust mask of at least Type P2) together with appropriate personal protective equipment (helmet, goggles, boots and protective clothing).

Luko

With semi-transparent coatings like those used on EQUITONE [natura] and [natura pro] panels, moisture ingress at the panel edges and predrilled holes can become apparent. In wet weather, edges can assume a darker shade.

This colouration will fade and disappear over time. It is unlikely to re-occur but the length of time depends on seasonal weather trends.

To help prevent this phenomenon from occurring, the edges of all factory-cut EQUITONE [natura] and [natura pro] panels are impregnated with Luko edge sealant at the factory. The edges of EQUITONE [natura] and [natura pro] panels that have been cut on-site must then also be impregnated with Luko.

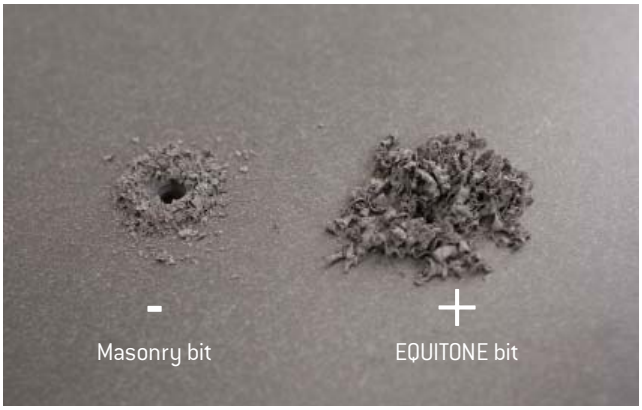
The following procedure is recommended:

1. Apply Luko in ambient temperatures between 5°C and 25°C.
2. Treat one panel at a time.
3. Pour adequate amount of Luko into reservoir of tray.
4. Use sponge applicator, dip into liquid and remove any excess.
5. Start at one side of the panel and angle applicator away from face of the panel.
6. Simply run applicator along panel edge.
7. Ensure full coverage of edge.
8. Repeat process if necessary.
9. Immediately wipe away any excess Luko that appears on panel surface.
10. Do not apply Luko in wet conditions or after panel is fixed into position.

Panel drilling

Panels should be drilled carefully using the specially designed EQUITONE fibre cement drill bit. This drill bit is a fully hardened steel bit with a cutting edge to suit fibre cement. This reduces risk of sliding on panel surface, provides a clean cut (no burrs or burning) and has a very long life.

Illustration at right indicates differences between a typical EQUITONE drill bit and standard masonry drill bits. Standard masonry drill bits produce fine dust, burning of the fibre cement and a distorted drill aperture.



For drilling to produce quality and consistent results, it is wise to observe some standard procedures, as follows:

- panel face up,
- carefully and clearly mark hole positions on face of panel,
- drill all holes with recommended EQUITONE drill bit,
- best drill quality achieved on solid workbench,
- do not drill multiple panels but one panel at one time to ensure accurate positioning of drill holes, and
- immediately clean all dust and pencil marks from panel.

RECOMMENDATION: On darker coloured panels, the use of red or white pencils makes clear identification of cut lines and drill hole positions easier.

Stain removal

EQUITONE [natura], [natura pro] and [pictura]

Stains can be removed by normal washing with mild detergents or soap solutions (e.g. dishwashing detergent) and a sponge. The use of abrasive materials – such as steel wool and scouring powders/ liquids etc – is not permitted as these cleansing agents will cause irreparable surface scratching.

EQUITONE [tectiva]

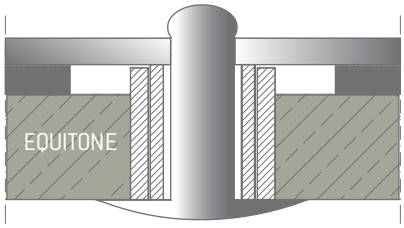
With its uncoated true surface, most marks and stains, or even superficial scratches are easily removed by normal washing with mild detergents or soap solutions (e.g. dishwashing liquid) and a sponge. Stubborn stains and marks are usually removed by a light sanding of the surface with exceptionally fine grit sandpaper in the same direction as the surface texture or grain. Brush away any residual dust.

Fixing

Visible rivet fasteners

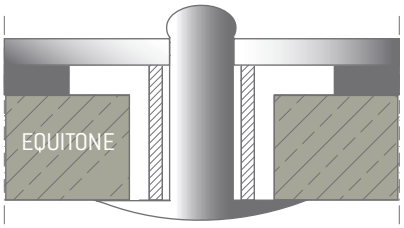
Stainless steel rivets can be used with aluminium, galvanised or stainless steel supporting frames.

Fixed point



Drill an 11mm diameter hole in panel and 4.9mm hole in rail. River sleeve used in conjunction with rivet.

Gliding point



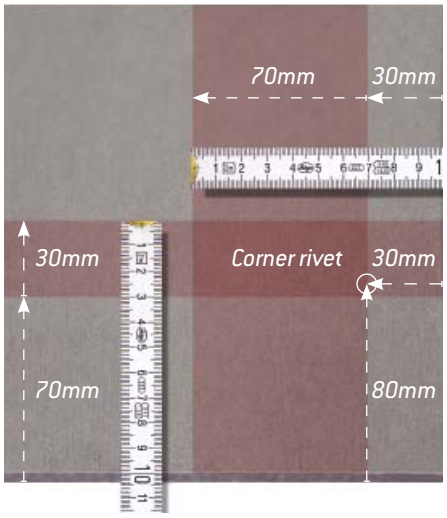
Drill an 11mm diameter hole in panel and 4.9mm hole in rail. Use only the rivet.

A centralising tool is used to drill the rivet hole in the supporting frame.

An option of using a rivet setting tool – fitted to the end of the rivet gun – can be used to minimise risk of scratching panel surface.

Hole positioning is as follows:

- from the horizontal edges of the panel, i.e. 70mm –> 100mm, and
- from the side edges of the panel, i.e. 30mm –> 100mm.



Some framing systems will only permit the rivet to be 40mm from the side edge. Placing corner rivets visually 80mm from the horizontal edge is the preferred location. Centres for the rest of the fixings are determined according to project engineer's wind load calculations.

All fasteners must be inserted perpendicular to the panel surface, and must not be over tightened to impede the free movement of the panel.

NOTE: When drilling occurs at project site, a template for hole positions is simple but useful tool that helps accelerate the process, particularly for corner holes. The template can be fabricated on site but extra care should be taken not to leave marks on the face of the panel.

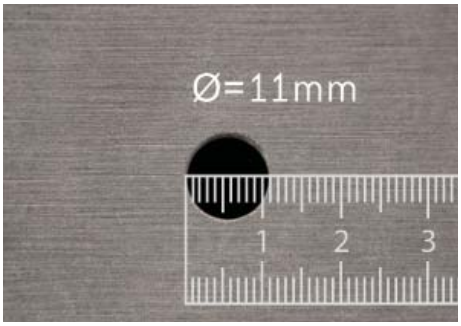
Distances of rivet fasteners with respect to wind load

It is the responsibility of the installer to ensure that the metal support frame is installed in accordance to the structural engineer and metal support frame supplier's recommendations, specific to project requirements. EQUITONE panels, however, must be fixed in accordance with guideline below.

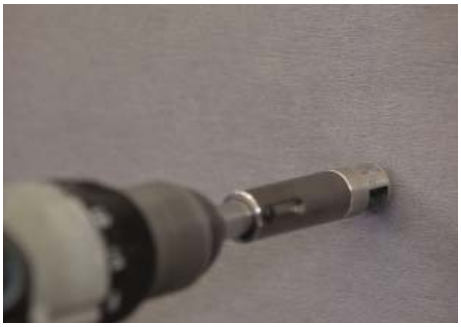
Design wind load	Maximum centre distances of rivet fasteners
≤ 1.2kPa	600mm
1.2–2.0kPa	500mm
2.0–2.5kPa	400mm
> 2.5kPa	300mm

As a general rule of thumb, above maximum distances between rivet fasteners must be respected.

Step-by-step panel fixing



1) Place foam tape onto support frame metal profiles. Drill all holes in panel with 11mm diameter bit.



2) Starting with fixed points, insert 4.9mm centralising tool into holes and drill through support frame profiles. Remove any debris.

3) Fixed points: place rivet into fixed point sleeve and load into rivet gun. Insert rivet with fixed point sleeve into predrilled hole and pop the rivet.

4) Gliding points: continue with gliding points, insert 4.9mm centralising tool into holes and drill through support frame profiles. Remove any debris.

5) Insert only rivet into rivet gun and place into predrilled hole and pop the rivet. Fix gliding points after fixed points are completed.

Fixing

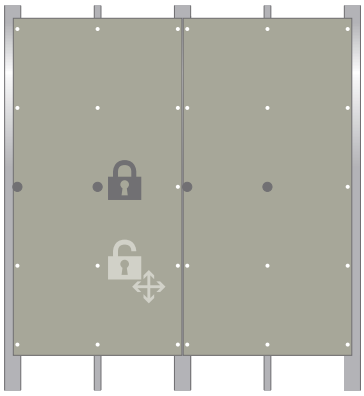
Fixing and gliding points

To allow for expected movement in the supporting frame, panels are fastened to the supporting frame with a combination of fixed and gliding points. All sizes of EQUITONE panel come with two fixing points and a few gliding points in adjacent position.

The two fixing points support weight of the panel and ensure panel stays in position and prevents rotation. The gliding or sliding points resist wind load while accommodating any panel or support frame movement.

The choice of where fixing points are located is important to minimise risk of panel cracking.

Fixing point *Gliding point*

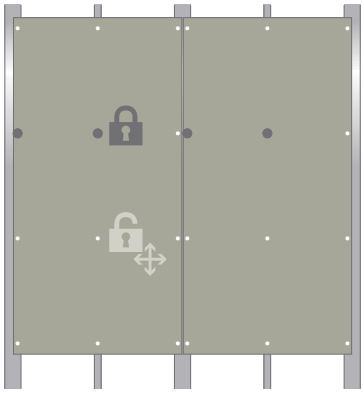


Example 1

Selection of fixing points

Two fixing points should never occur on the same supporting frame (profile). The two fixing points must be located near the horizontal centre line of the panel. If there is no central fixing, use the next row closest to the centre line; the usual preference is for the higher line of fixing.

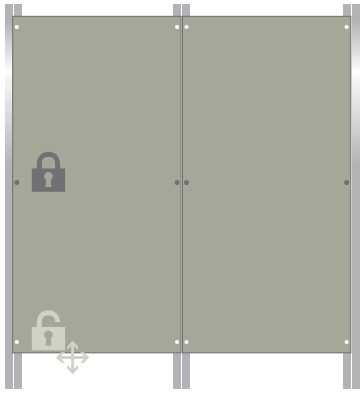
Two profiles are therefore needed. This is straight forward where there are at least two profiles in the middle area of the panel.



Example 2

Most common, however, there is only one profile in the middle area of the panel. Hence, the rule of thumb is that fixing points are located in the centre of the panel and to the left joint profile. Alternatively they can be located to the centre and right joint profile. Which system is employed, all panels must be the same.

Under no circumstance should the fixing point of two adjoining panels occur on the same joint profile.



Example 3

In situations where narrow panels with only two side fixings are used and the fixing points of adjacent panels will be next to each other, components of supporting frames will need to be changed. The metal frame behind the vertical joint which is usually a T or top hat profile will have to be substituted with two L-profiles or an omega profile. This will separate any panel connection.

Framing

Support frame

EQUITONE panels are strong yet light, reducing the amount of supporting frame needed when compared with other materials. Certification for the structural stability of any supporting frame should be in accordance with local building regulations and must be obtained by the building owner or official representatives, such as the project engineer.

Requirements

Whichever supporting frame is used, the wall should be checked by the installer prior to installation to confirm that it is flat and true, and that correct fixings and details are employed. Any discrepancy should be referred to the design team.

Structural design

All components of the external cladding must be designed according to the safety factors and permissible design load stipulated in national and local building and safety code regulations.

Support frame layout

The most common arrangement for panel support is onto metal supporting frames. Vertical profiles ensure that the air flow in the cavity space is not disrupted and that there is free drainage of any moisture.

Anchoring

Whichever supporting frame is used, the secure anchoring or fixing of the frame back to the wall is very important. The design and selection of the anchor to suite the wall substrate characteristics and the wind load should be based on engineering calculations, together with on-site tests. This is important with renovation projects, especially when the performance of the wall is unknown. These calculations will determine the amount of anchors required.

Many proprietary support frame systems have guidance of the secure fixing back to the structure.

Framing

Metal supporting frame

Metal supporting frames – whether aluminium, galvanised steel or stainless steel – are normally a locally sourced component. Typically, the supplier or installer of this type of framing will confirm specifications and performance characteristics, as well as provide detailed technical drawings. The following information is therefore provided as guidance only and should be verified for each project by the project engineer.

EQUITONE panels can be rivet fixed to metal supporting frames. Always use stainless steel fixings and fasteners.

Depending on local availability, standard supporting frame consists of vertical profiles in different widths profiles which support the EQUITONE panels.

Please refer to local regulations for the level and quality of aluminium, stainless steel or galvanised coating.

These profiles are normally fixed back to the main structure. However where a wider cavity is required angle brackets can be used to support the vertical profiles.

Specification

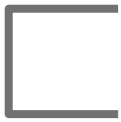
Wider profiles are used behind vertical joints between panels while a narrower profile is used as intermediate profiles in the middle of the panel. It is advisable to use a vertical profile that allows for tolerance and any discrepancy in component layout and installation dimensions.

Minimum profile thickness	Aluminium Galvanised/stainless steel	≥ 2.0mm ≥ 1.15mm
Minimal depth of profile		≥ 35mm
Minimal width of intermediate profile		≥ 40mm
Minimal width of vertical joint profile		≥ 90mm
Recommended width of joint profile		≥ 120mm
Maximum buckle under influence of strain		≤ Span/250
Safety factor calculation of strength		3
Maximum length of vertical profile		6m
Movement joints between adjacent profiles		20mm
Maximum unsupported length from last bracket/anchor		250mm

Continued on opposite page

Specification

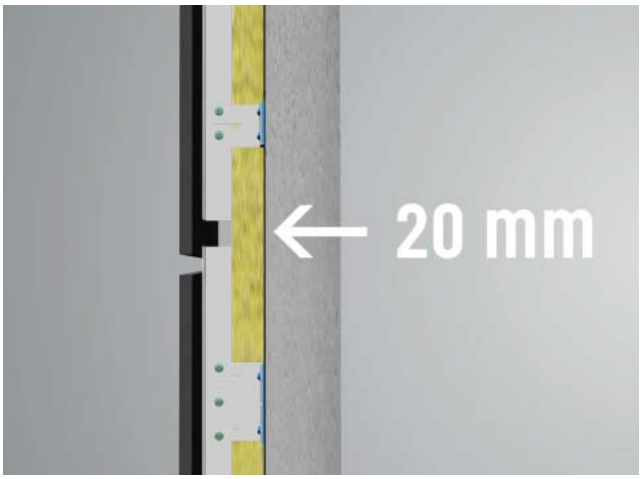
Table below summarises the common metal sections that are available.

Position	Section
Vertical joint profiles	Rectangular or square hollow 
	T-profile 
	Top hat, furring channel or Omega profile 
Intermediate profiles	Rectangular or square hollow 
	L-profile 
	C-profile 
	Top hat, furring channel or Omega profile 
	Z-profile 

Framing

Movement of supporting frame

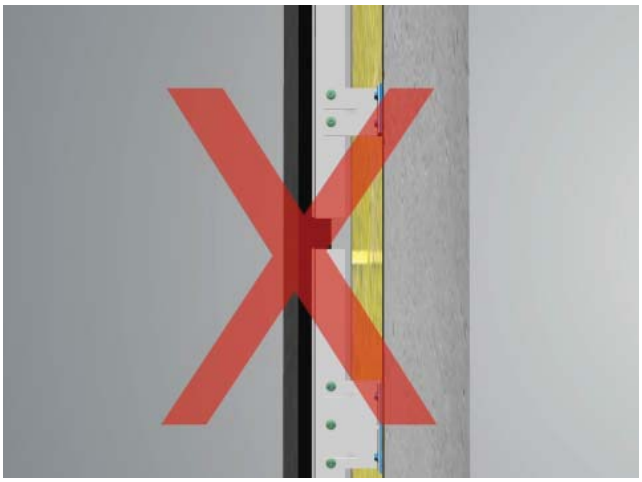
Allowance for any expansion and contraction of the metal supporting frame needs to be taken into account in the overall design of the system. The principle of fixing and gliding points is a good one and where possible is recommended for all metal supporting frames. This is particularly relevant in ecologies that experience climatic extremes and big variations in temperature.



1. Joints between profiles must also coincide with horizontal joints between panels.

2. A minimum 20mm gap should be allowed between profiles.

3. Joints in profiles should be at same levels around the building envelope.



4. Panel is never fixed to two separate profiles.

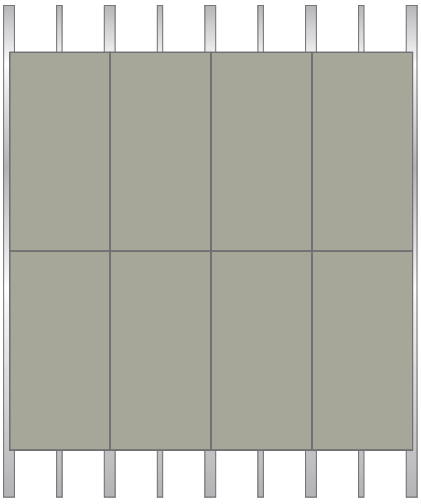
5. Movement in profiles may cause panel to crack.

Panel layout

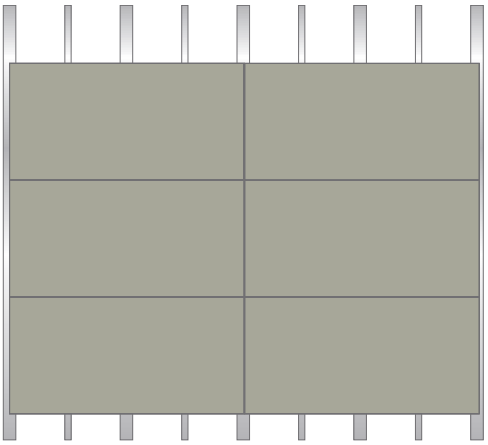
While design of the supporting frame is calculated around wind load the facade is likely to experience, another important factor is the actual panel layout desired by the architect. The panel layout can exert a big influence on the amount of large or small profiles required by the project.

Other influences on the supporting frame layout include stagged panel joints or totally free patterns which use different size panels in a random layout. These considerations can result in the use of all large profiles.

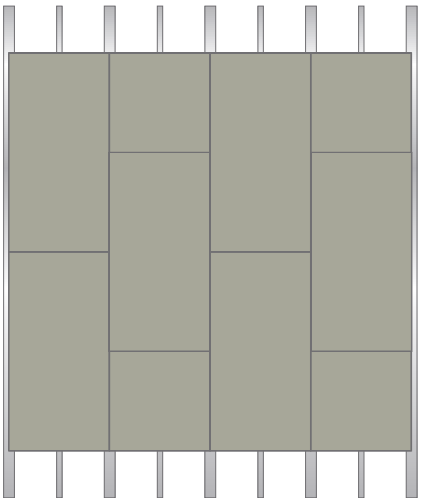
Vertical layout: aligned grid pattern



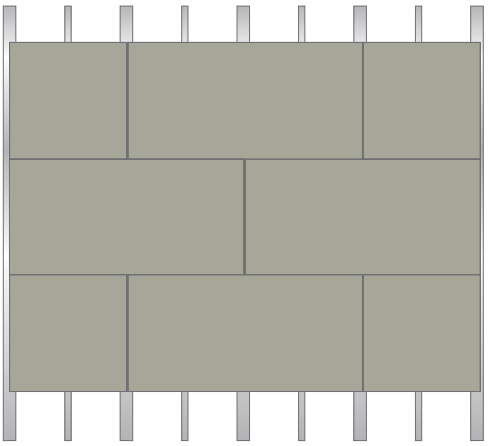
Horizontal layout: aligned grid pattern



Vertical layout: staggered grid pattern



Horizontal layout: staggered grid pattern



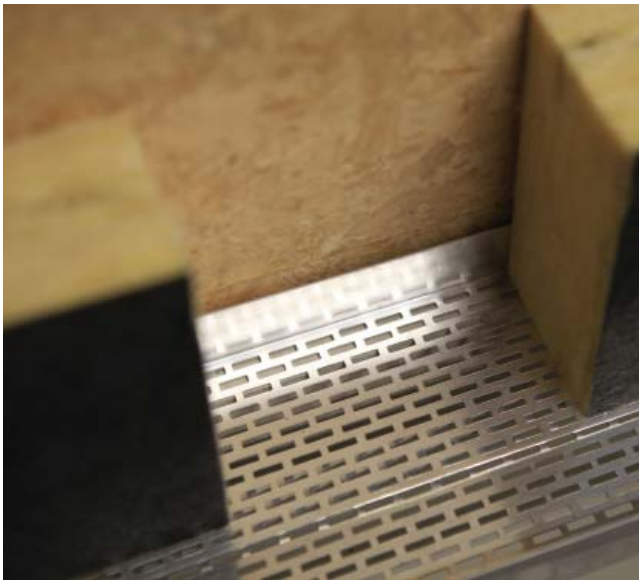
Panel layout

Ventilation

A through flow of air is achieved by utilising the stack-effect, in which a current of air enters at the base of the cladding and exits at the top.

In addition to necessary ventilation to cavities at the top and bottom of the facade, it is also important to allow air to enter and exit under and over openings such as windows.

These openings need to be protected against entry of birds and vermin into the cavity space.

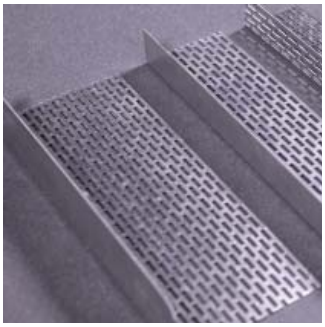


Failure to protect against these natural phenomena can cause damage to the backing wall.

Effective protection is normally achieved by fitting a perforated profile. It is vital that perforations are sized correctly, to allow air in and out while preventing entry of vermin.

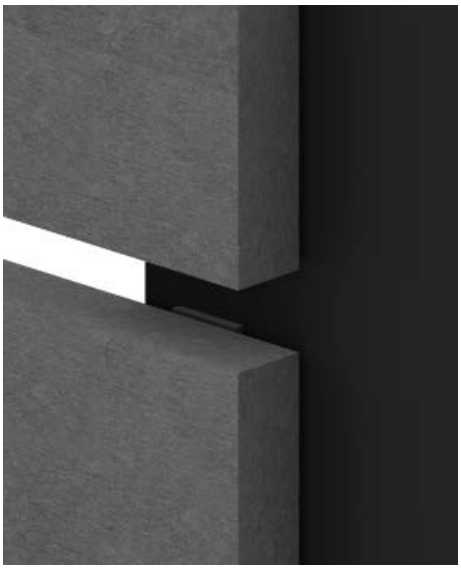
A minimum free space of 10mm/m or a 100cm² per linear metre is recommended.

To compensate for the perforated profile, which can reduce air flow by 50%, and other building irregularities, the gap should be at least twice what is theoretically required.

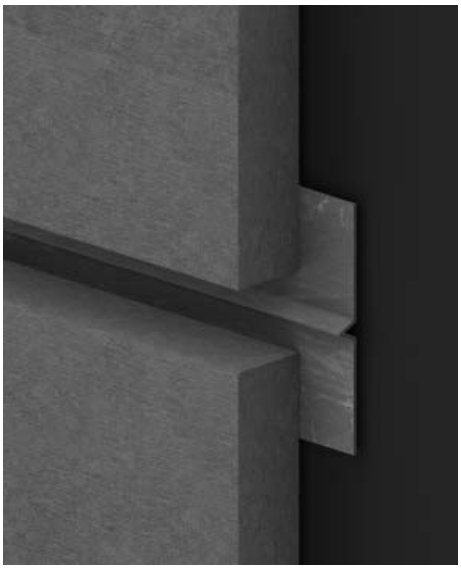


Panel joints

Normally two types of joints are used between panels.



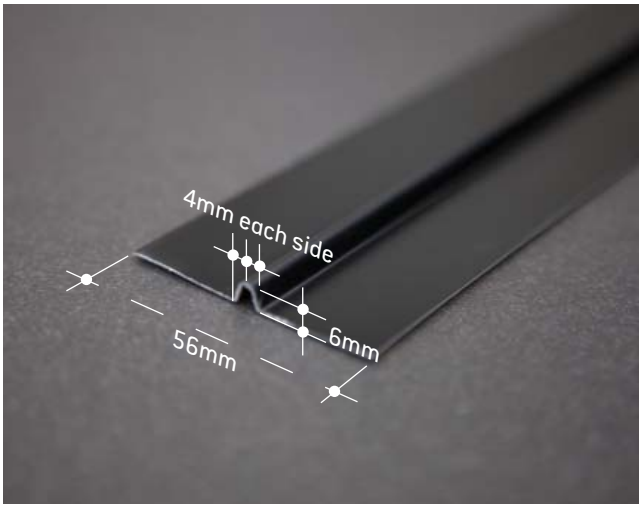
1) Open joints in which there is a clear open gap between edges of adjoining panels.



2) Closed joints where a horizontal joint profile is used to block the direct line through the joint.

NOTE: Sealed joints where a gasket or wet applied sealant is used to fill the joint and make it water-tight and air-tight is never specified with EQUITONE panels. This can result in unsightly staining and the sealant losing its colour.

Closed horizontal joints



When a horizontal joint required to be closed, a metal joint profile of maximum 0.8mm thickness can be inserted behind panels.

By using a joint profile the majority of water is prevented from entering the cavity. In some buildings it is advisable to have closed joints, such as the low areas of public or educational buildings. The joint profile will prevent debris from being deposited behind the panels. In the case of kindergartens, baffles will prevent small fingers from getting stuck in the joints.

Continued on next page

Panel layout

Closed horizontal joints

Continued from previous page

1) Before final fixing of the lowest rivets on a panel, the profile is slid up under the panel.

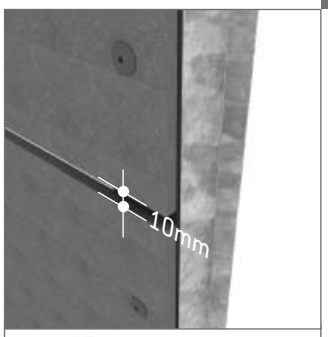
2) When fasteners are tightened, the profile is held in place. At the junction with a vertical joint the profile can be trimmed to maintain a pleasing vertical joint appearance. The profile can be cut approximately 4mm narrower than the width of the panel, leaving the profile 2mm shorter at each side.

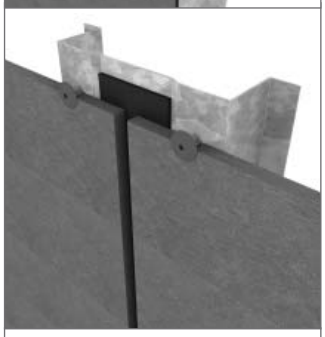
3) To prevent sideways movement of the joint profile, and exposing that movement at vertical joints, cut and bend top or bottom edges of the profile at both sides of one of the vertical support profiles or battens.

Open horizontal joints

By leaving the joints open, the likelihood of dirt spoiling the facade reduces as the joint remains clean. The open joints also function as additional ventilation openings. An open joint also has the effect of reducing wind load on the facade panel. Therefore, it may be possible to reduce the number of fasteners.

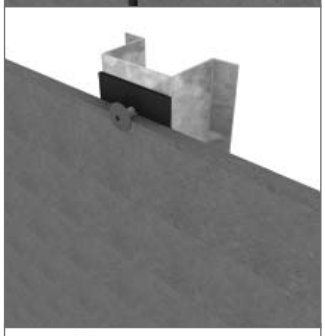
Remember the supporting frame is visible with open horizontal joints. The joints may need to be concealed using black profiles, paint or tape.





Joint width

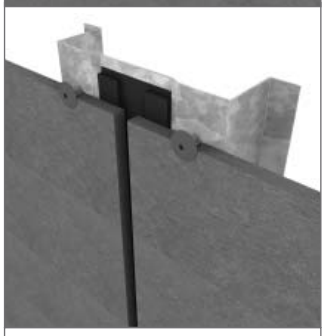
Many years of practice have shown that the optimum width of the joints between large panels is 10mm. This also offers the installer a reasonable level of tolerance when setting out the frame and fitting the panel. The minimum permissible joint width is 8mm while the maximum would be 12mm.



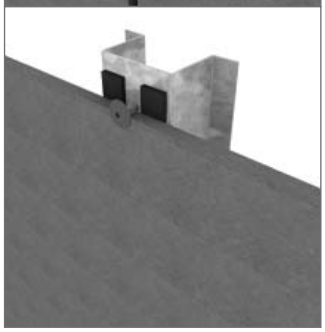
Vertical joints

Vertical joints are backed with a continuous profile. When a metal supporting frame is used, the grey or silver colour can be prominent, especially when used with dark coloured panels. This could be an unappealing feature. To eliminate this potentially unattractive feature, the best solution is to simply “black out” the joint.

The “black out” of a joint can be achieved by using black UV light resistant wide foam tape. If the foam tape is an integral part of moisture management design strategies, the tape must be compressed between panel and profile. To prevent distortion of the panel at mid fixing points, the foam tape needs to be placed on smaller top hats.



When narrow strips of foam instead of one wide strip are used, place one continuous strip to each side of the open joint. The visible metal can then be simply taped or painted to help conceal it. Alternatively, coated metal profiles can be considered. Make sure profiles are prepared correctly before painting or taping as new metal profiles can have an oily surface. To prevent distortion of the panel at mid fixing points, foam tapes need to be placed on the smaller top hats.



NOTE: The functional life of painting or taping profiles on site is not as long as anodised metal profiles.

Others

Sub-structure – lightweight wall

A lightweight structure of metal or timber stud is a form of backing wall. This can be a full structure or an infill wall between concrete floors.

It is the responsibility of the project engineer to ensure allowance for any movement in the frame and that the structure is properly accommodated with all the specified connections.

The face of the sub-structure requires appropriate quality sarking or sheathing to provide suitable management of moisture ingress. It is the responsibility of the designer to specify a suitable moisture management system.

For open jointed systems, this sarking must be a solid fibre cement building board that also act as a "wind shield". The board may be required to offer some frame racking resistance or fire resistance should be sized correctly. This wind shield must be airtight and this can be achieved by taping joints with suitable long lasting tape.

Windows, doors and other penetrations

Whether the main structural wall is a timber/metal lightweight frame or a massive masonry construction, the wall should be watertight and airtight, particularly around openings such as windows or doors. Before fixing the support frame or panels, all penetrations must be properly sealed.

Air tightness prevents moisture ingress and ensures the building remains thermally efficient. Fix the windows or doors to the backing wall and seal the edges with appropriate materials to reduce the risk of any moisture ingress. All material or flashings and their installation must comply with the relevant standards and building codes.

Movement joints

The term "movement joint" or "expansion joint" refers to the isolation joints provided within a building to permit the separate segments of the structural frame to expand and contract in response to temperature changes without adversely affecting the building's structural integrity. In simple terms, movement or expansion joints relieve stress on the structure. Failure to incorporate these movement joint gaps into the structure can result in cracking under structural stress.

The size and location of any movement joint is related to the choice of structural building materials and local climate conditions. The ventilated facade has its own built in movement joints, with its combination of fixed and gliding points. However, the main building movement joints must be continued through to the external face of the panel. The ventilated facade cladding should not be fixed to both sides of the structural movement joint.

Cavity

The cavity is a primary feature of a ventilated facade. It is designed to act as a pressure cushion to prevent water from reaching the backing wall. By ventilating the cavity, moisture that arises from water passing the panel, moisture migrating from the inner surface of the wall or the action of condensation will be removed either by evaporation, or simply running down the back of the panel. In the event, moisture escapes out and away from the backing wall.

Cavity width

It is generally considered that the minimum cavity width should be at least 20mm immediately behind the back of the panel. However, this is only suitable for low rise buildings with open joints. As the facade gets higher, the cavity needs to increase in width.

The type of joint used between the panels will also have an influence on cavity width. Open horizontal joints will allow move air movement than closed joints. A wider cavity may therefore be considered with closed joints.

Generally, the recommended cavity width with closed joints is as below:

Building height	0–10m	10–20m	20–50m
Minimum cavity width	30mm	40mm	50mm

NOTE: On renovation projects, when designing the width of the cavity, it is important to make allowance for tolerance. Building irregularities, especially uneven backing walls, must never compromise the width of the cavity. This is critical when a horizontal support frame is incorporated into the cavity space.

A sequence or method of placing EQUITONE panels on the facade must be followed to minimise the risk of damage to the panels. The installer needs to survey the main supporting structure, checking line, level and fixing points. At the same time, the installer must also set out datum points, lines and levels for a complete elevation view.

Please refer to the project architects elevation drawings for layout of joints and line of fasteners. Note the relationship between the fixings and openings such as windows.

Experience indicates that the best sequence in placing EQUITONE panels that are face fixed is to commence at the top of the facade and work downwards.

Top-down method

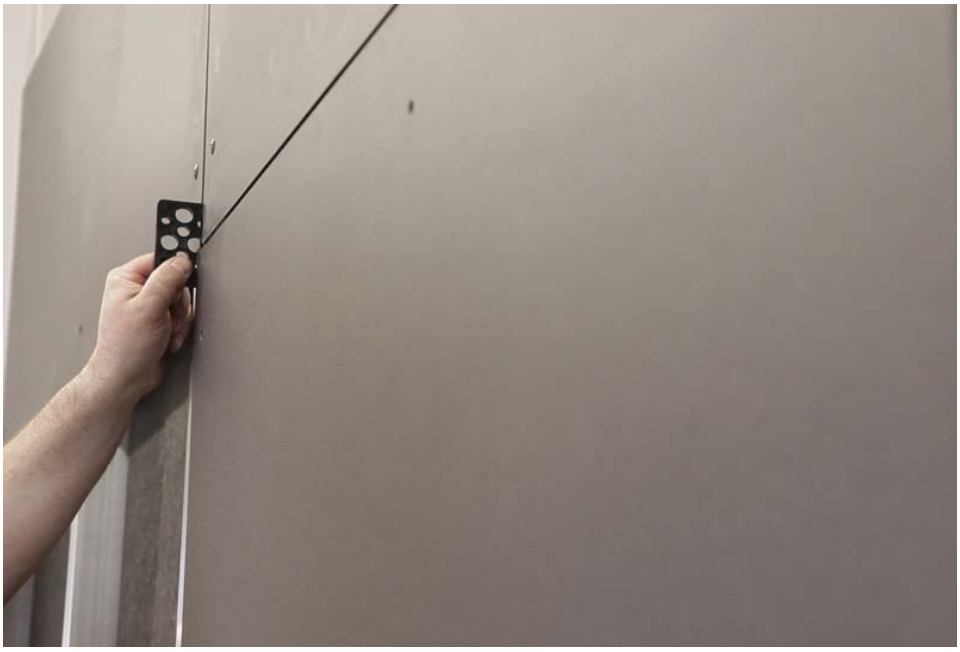
This method brings a number of benefits to the installer:

- using the support rail ensures accurate joints,
- support rail acts as additional workman,
- reduced risk of dirty panel as installer works away from installed panel,
- reduce risk of damaging panel by working on scaffold, and
- reduces time required to clean facade.

1) Starting at the top of the facade, mark bottom edge of the top panel on the profiles. Align this position mark across the facade. Temporarily clamp a metal support rail across profiles. This support rail will act as another workman and carry weight of the panel, allowing easy adjustment prior to fixing. Lift first panel on to this rail and position into place. Securely hold or temporary clamp panel into position.

2) Always fix central fixing points or middle points first to hold panel in place, and then work outwards towards edges with other fasteners. Remember, if a horizontal joint profile is in use, do not fix bottom row of fasteners at this stage.

3) Lift and slide next EQUITONE panel into place. Use 10mm spacers of a type not to cause damage when being removed, and to create a consistent vertical joint gap. Fix this panel as with first panel and continue across facade, moving the support rail as work progresses. With the top row in place, remove support rail.



4) Measure down from bottom edge of the upper fixed panel and mark position of bottom edge of next row of panels. This measurement is equivalent to the height of the panel plus the horizontal joint (panel +10mm).

Using this new level, temporarily fix the metal support rail across the profiles again. This is the time to insert the horizontal joint profile. Slide the profile into place and then fix the missing fasteners in the panel above. These will hold the profile in place.

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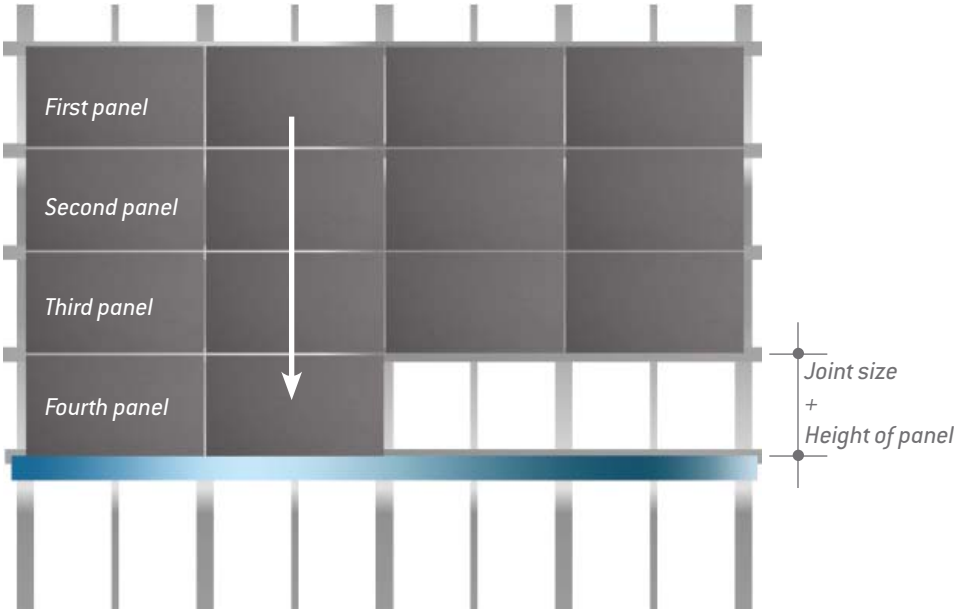
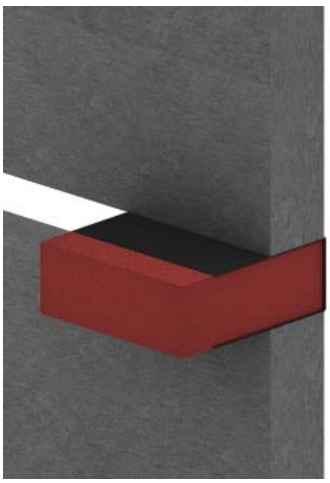
5) Lift the first panel of this row on to this rail and position it into place, aligning panel vertical edge with edge above. Repeat fixing sequence for the panel. Continue working across facade. The complete procedure is then repeated sequentially down the facade of the building.



Facade scaffolding can also be stripped down as cladding proceeds, ensuring no future damage will occur from other trades. Position any trim profiles and any flashings as work proceeds. Ensure all movement joints are correctly formed. Repair any panel damage or defects as quickly as possible.

Special situations

It is sometimes necessary, for limited applications, to commence cladding from the base of the facade. This can be done successfully but requires the installer to take extra care and attention to prevent damaging panel edges. The most likely damage will be the top edge of the lower panels because the weight of the upper panel rests on the spacers. These in turn rest on the lower panel. Removal of joint spacers must therefore be achieved with utmost care.



One suggestion is to use an 8mm spacer and wrap a 1mm rubber strip around the top face, back edge and bottom face of the spacer. Remove the spacer first and then the rubber strip. The rubber strip protects the edges of the panels as the spacer is removed.

Base details

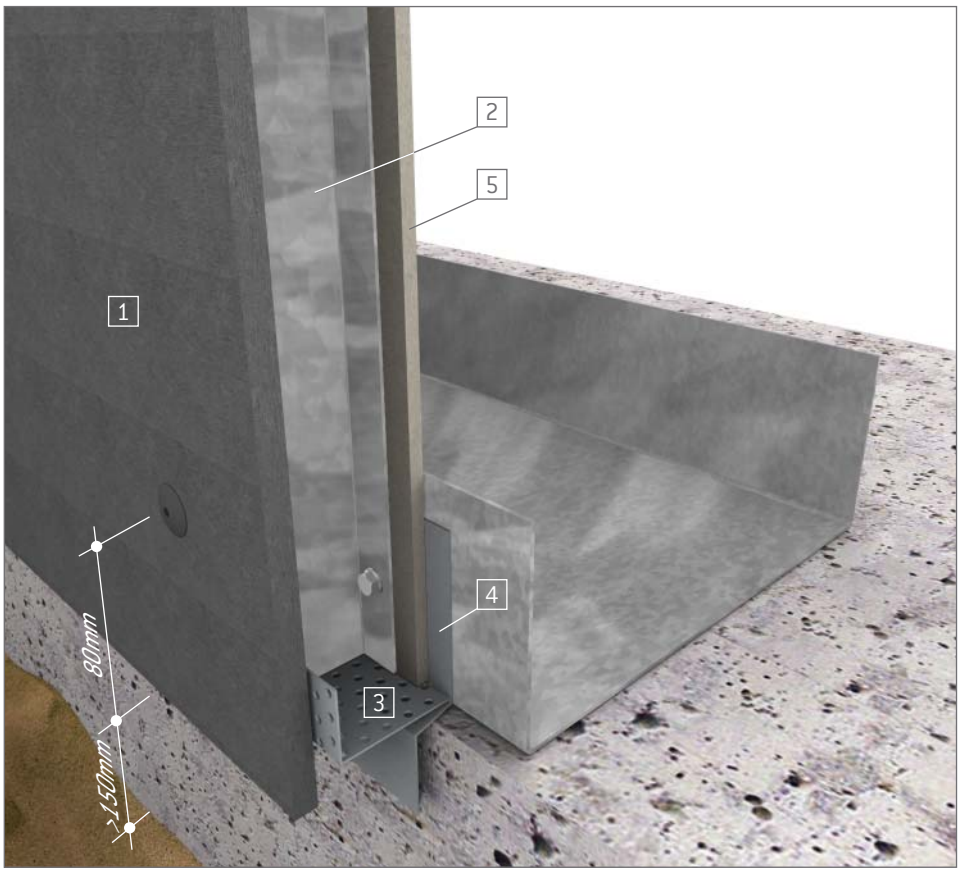
1. EQUITONE panel
   Ends of panels are typically positioned a minimum 150mm above the finished ground level. This will help prevent rain splash-back from the ground while maintaining sufficient space for the air to enter the cavity. No planting of garden, decorative or ornamental plants should be allowed near the air inlet, over time these may block air inlets.

2. Metal support frame
   It is recommended that the panel overhangs support profiles and perforated profiles by 20-50mm, forming a drip to all rainwater to fall away from the building. The bottom row of panel fixings should be between 70-100mm up from the bottom edge of the panels.

3. Perforated profile
   The space between the panels and the wall must have a perforated profile fitted. This allows air to enter the cavity space while preventing the entry of birds or vermin. Fix the perforated profile to the vertical profile and ensure it extends to within 5mm of the backing wall.

4. Drip flashing
   Drip flashing can be used to protect junction between the concrete and the metal structure.

5. Sarking should lap over the drip.



Parapets

1. EQUITONE panel
   Panel fixings can be placed between 70-100mm from the top edge of the panel.

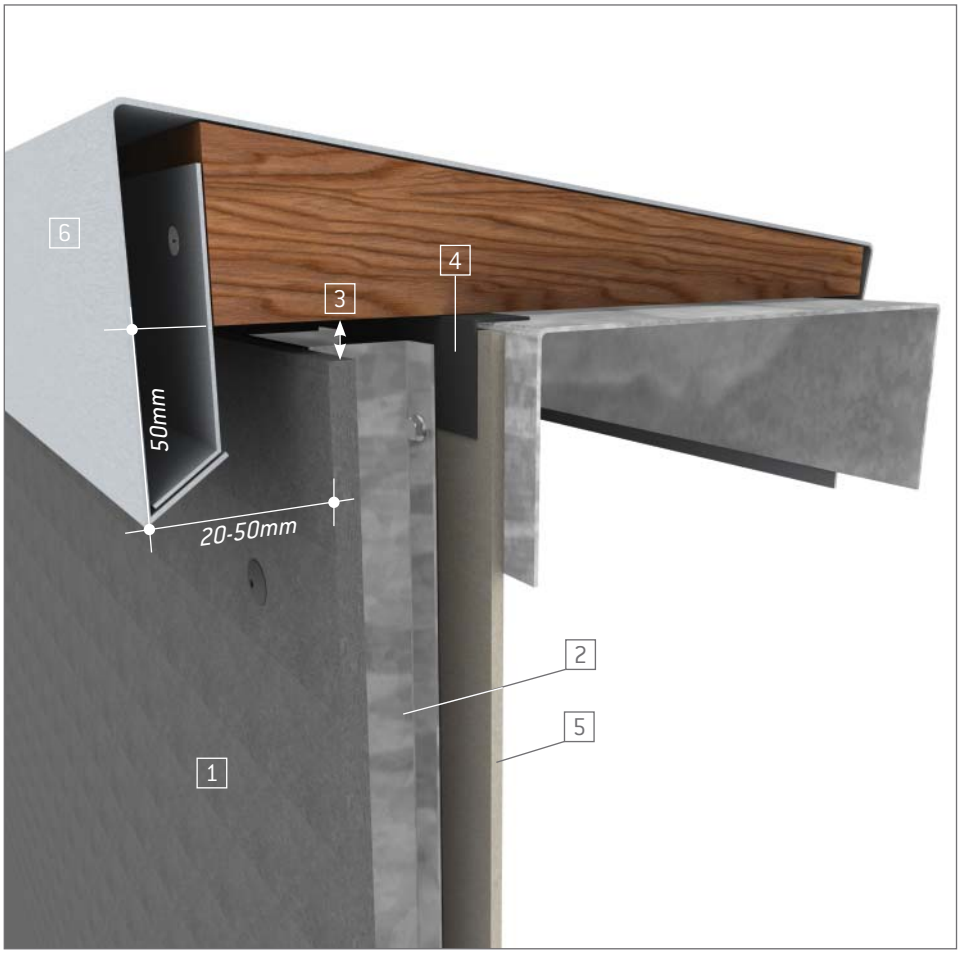
2. Metal support frame

3. Gap to allow air to escape
   Air must be allowed to exit the cavity behind the parapet capping. A perforated profile can be used to prevent entry of birds or vermin.

4. Air tight seal

5. Sarking

6. Metal capping
   A 20-50mm gap should remain between front of panel and the front edge of the capping, depending on the height of the vented wall. The front edge of the capping must offer adequate cover to the panels and provide a minimum of 50mm protection.



Window sills

1. EQUITONE panel

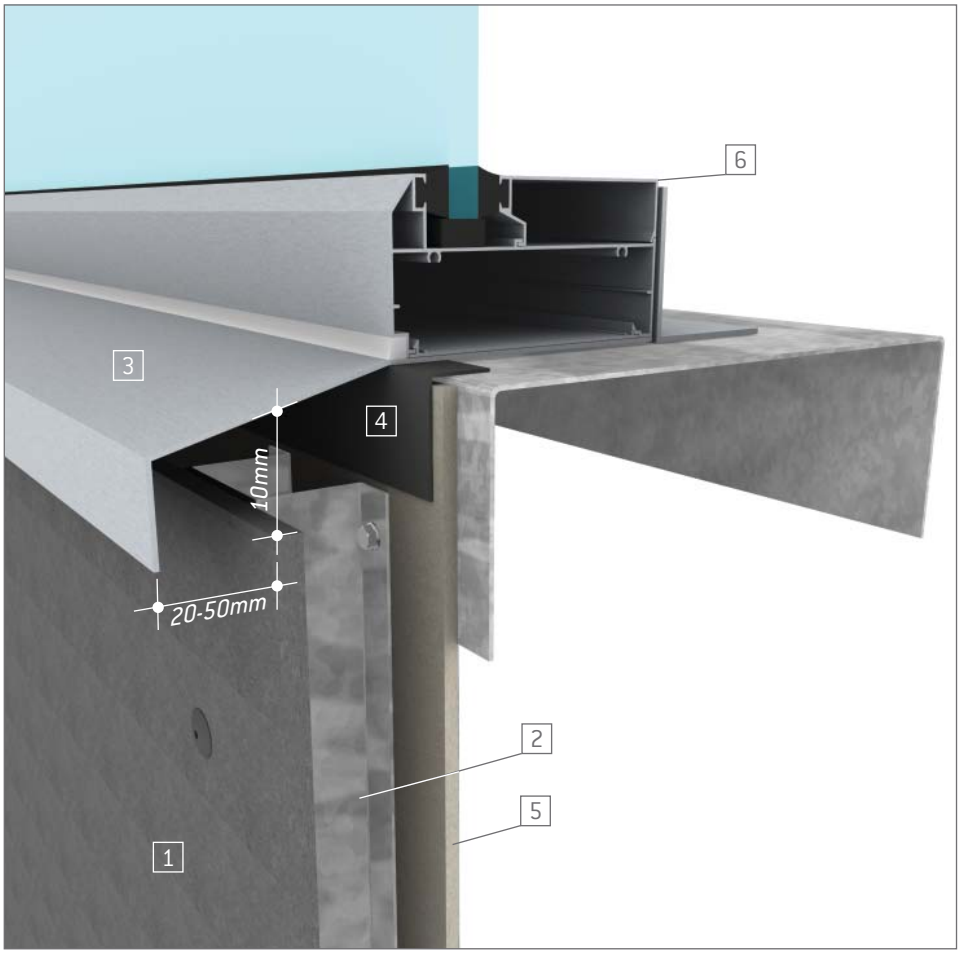
2. Metal support frame

3. Sill
   Air from the cavity must be allowed to exit under the sill. A minimum 10mm gap should be left between the panel and the base of the sill. A perforated profile can be used for wider gaps to prevent entry of birds or vermin. The front edge of the sill can be between 20-50mm away from the front of the panel and offer adequate cover to the panels. This provision ensures that water is thrown away from panels.

4. Air tight seal

5. Sarking

6. Window profile



Window / opening heads

1. EQUITONE panel

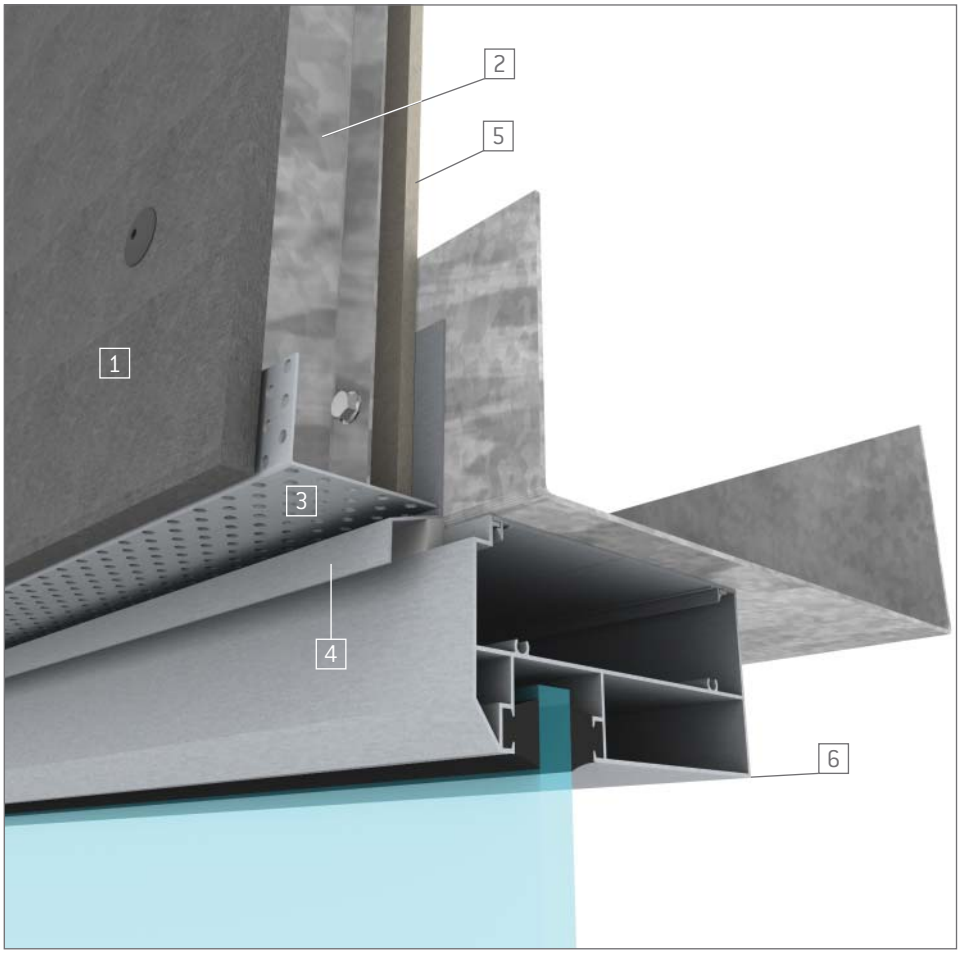
2. Metal support frame

3. Perforated profile
   Air must be allowed to enter cavity above heads of windows, doors and other openings. A perforated profile can be used to protect the opening from the entry of birds or vermin. To help conceal the perforated profile, the installer can paint it black prior to fitting.

4. Drip flashing

5. Sarking

6. Window profile



Window / opening jambs

1. EQUITONE panel

2. Metal support frame

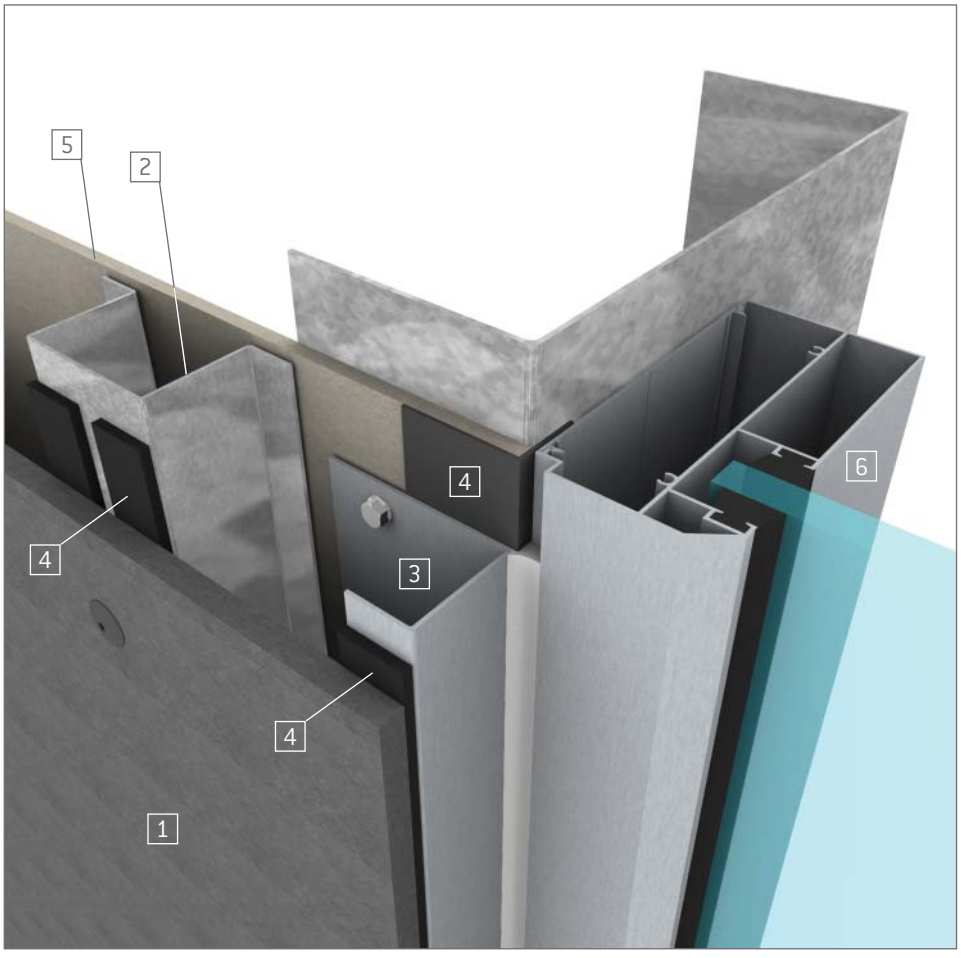
3. Flashing
   The ends of the window sill must be returned up behind the panel or the flashing at the reveals to offer adequate protection from moisture ingress. For wide reveals an F-profile accessory can be fixed to window frame to hold end of panel secure; the front edge of the reveal panel can be fixed to the support frame corner profile. For narrow reveals, specialist flashings as part of the window are generally considered to be the best option.

4. Air tight seal

   Use appropriate seals between the window and the flashing piece.

5. Sarking

6. Window profile



External corners

1. EQUITONE panel

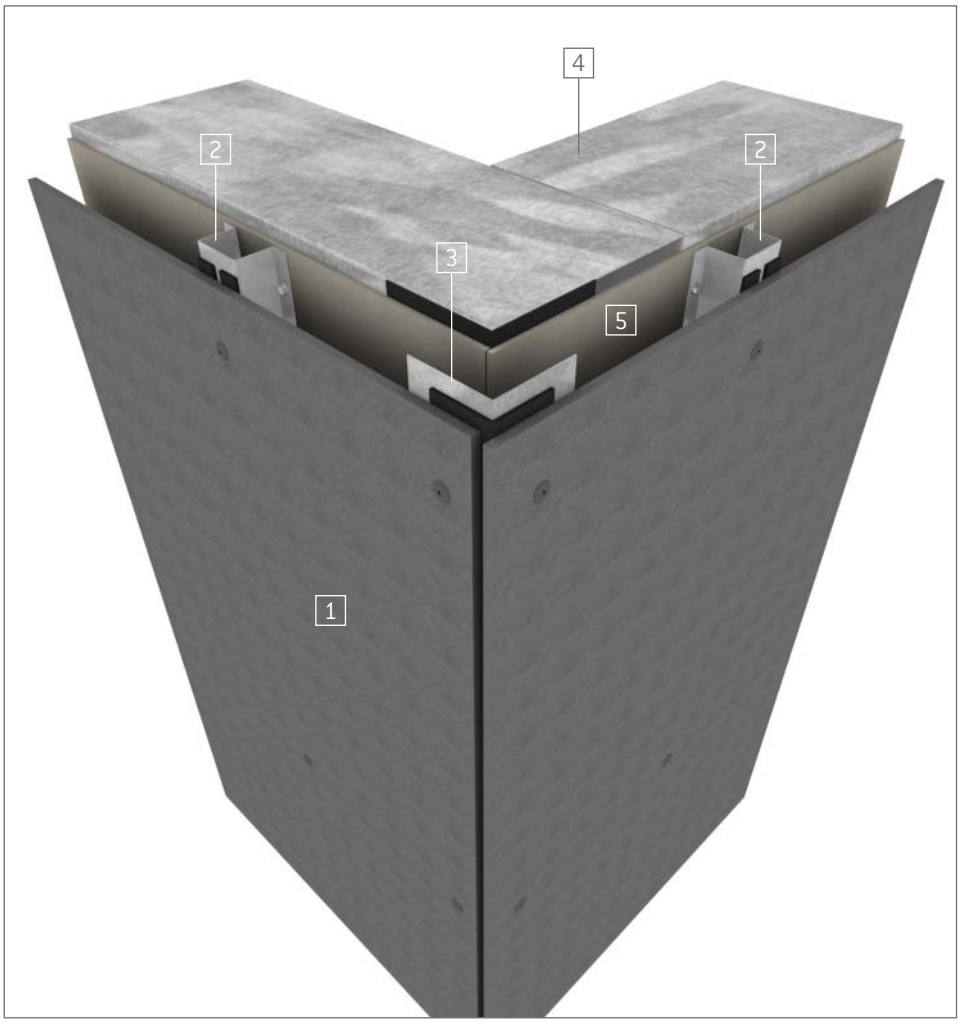
2. Metal support frame

3. Metal corner support
   Open joints typically employ 75mm x 75mm angles to support panel edges. Where this angle cannot be fixed back to the wall, provide panel support within 350mm of the corner. Joints in the corner profiles must coincide with support frame expansion joints.

4. Wall profile

5. Sarking

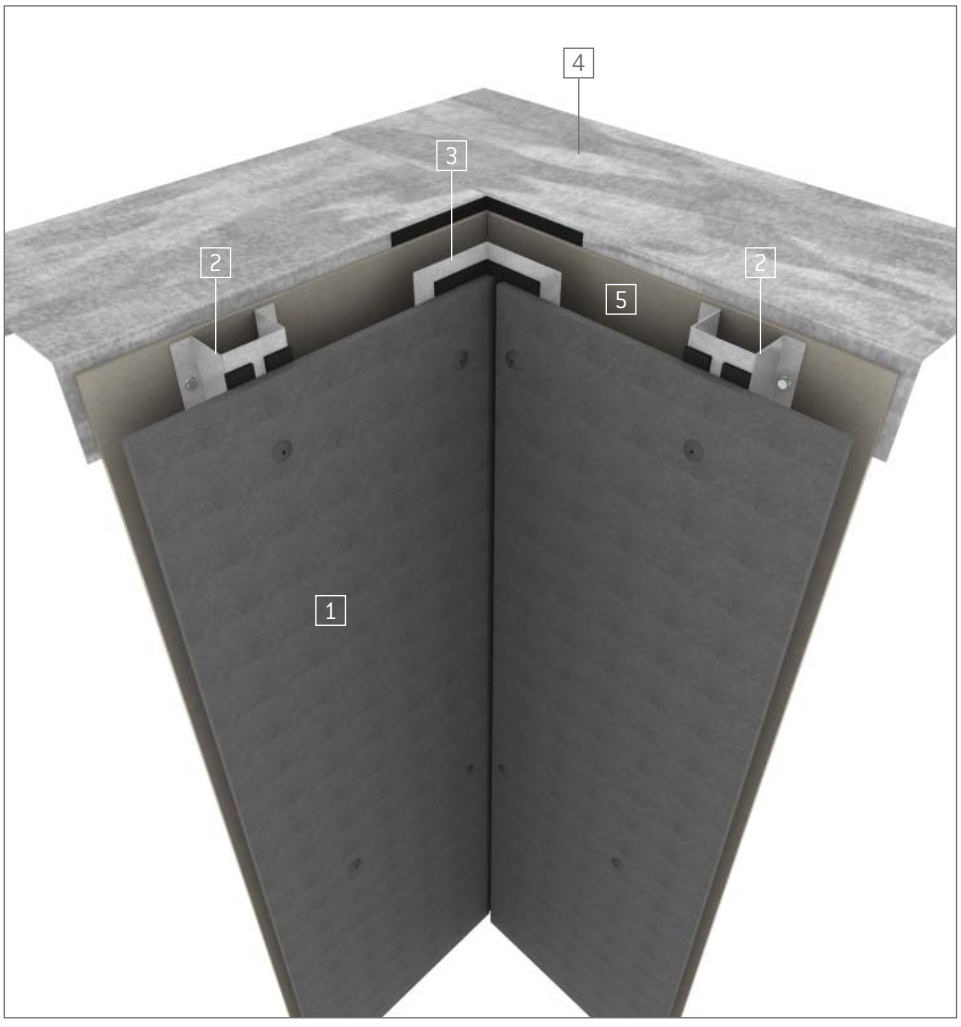
NOTE: External corners may be left as open joints or fitted with a proprietary trim profile. Trim profiles need to be fully supported on angle profiles.



Internal corners

1. EQUITONE panel
2. Metal support frame
3. Metal corner support
   A 75mm x 75mm angle profile can be used to support panel edges.
4. Wall profile
5. Sarking

NOTE: Internal corners may be left as open joints or fitted with a proprietary trim profile. Trim profiles need to be fully supported on angle profiles.



Expansion joints

1. EQUITONE panel

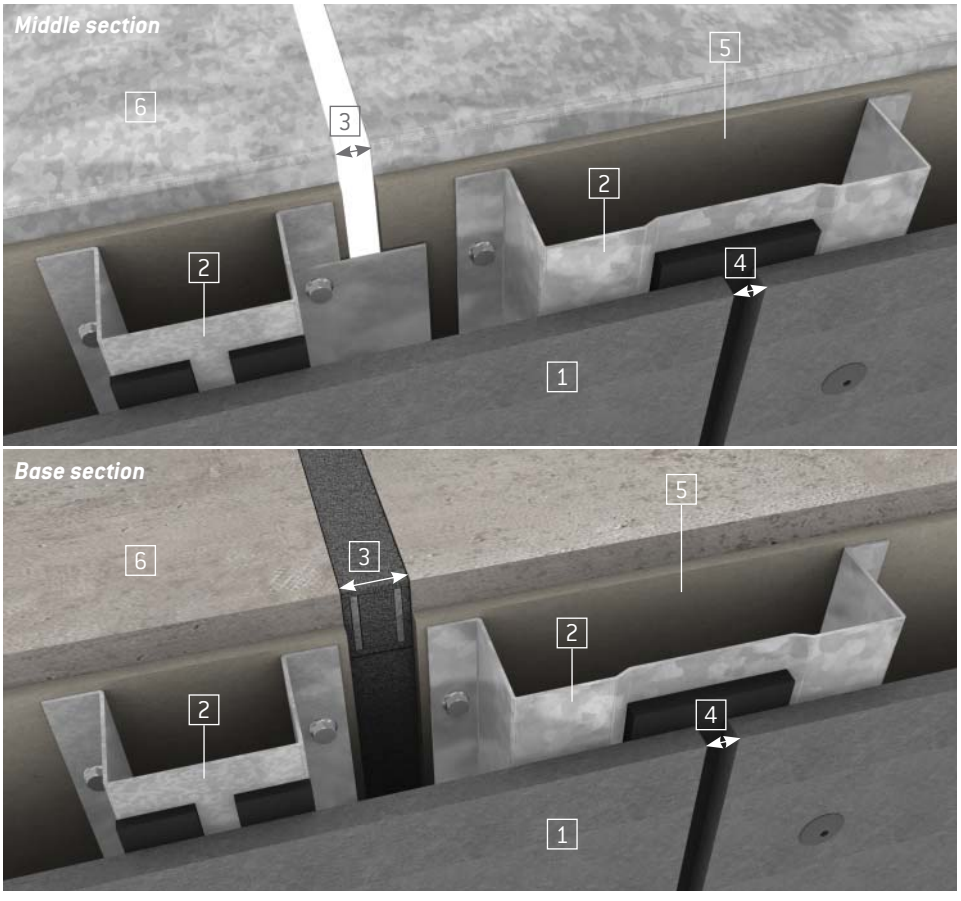
2. Metal support frame

3. Building expansion joints
   For the building structural expansion joints, the panel must not be fixed across or crossing over these expansion joints. A piece of metal flashing can be fixed at one side to cover the expansion joint for metal purlins. A propriety foam strip or joint seal can be placed to fill the expansion joint for concrete floors or slabs.

4. Panel expansion joints
   There is no special requirement for expansion joints with the panels as there is a gap on all sides and the fasteners allow for movement. Coordinate vertical joints in facade panels with that of the position of the expansion/movement joints. An additional vertical profile is used to support one of the panels. The larger profile allows this panel to slide. The gap left between the panels must be equal to that of the structural wall.

5. Sarking

6. Wall profile



A number of basic principles are overviewed here. Cleaning must always take place in accordance with the recommendations of the supplier of the cleaning system and under their supervision and guarantee.

Inspections

All facades, irrespective of the material used, should be inspected and if necessary serviced regularly. Then, unnecessary and high costs are avoided in the long term. The building also retains its continuous and attractive appearance. If general soiling is allowed to work into materials for too long, it is possible that it will penetrate so deeply that simple cleaning is no longer possible. More rigorous and thus more expensive cleaning methods may have to be employed.

Soiling process and metal cover flashings

Dust, soot, oils, greasy substances and atmospheric grime etc are ever present in the air and rainwater, and can be deposited on most facades. If care is taken through considerate design and application, local soiling and runs can be avoided. This can be achieved by having adequate drip-moulding, such as overhanging window sills, good sealing and attention to combat corrodible materials such as zinc, copper, aluminium, steel etc. The degree and speed at which materials become soiled largely depends on the surface, chemical stability, hardness, porosity and ability to become electrostatically charged or not.

Graffiti

The UV-cured EQUITONE [pictura] and [natura pro] surface coating provides superior protection against common colours and spray paints. It is smooth and cleanable. The EQUITONE [pictura] and [natura pro] surface coating meets the requirements of the placement test and test cycle 2 of the quality association for anti-graffiti eV for surface-protective anti-graffiti. Please refer to ILF 4-013/2006 report of the Institute For Paints And Inks eV.

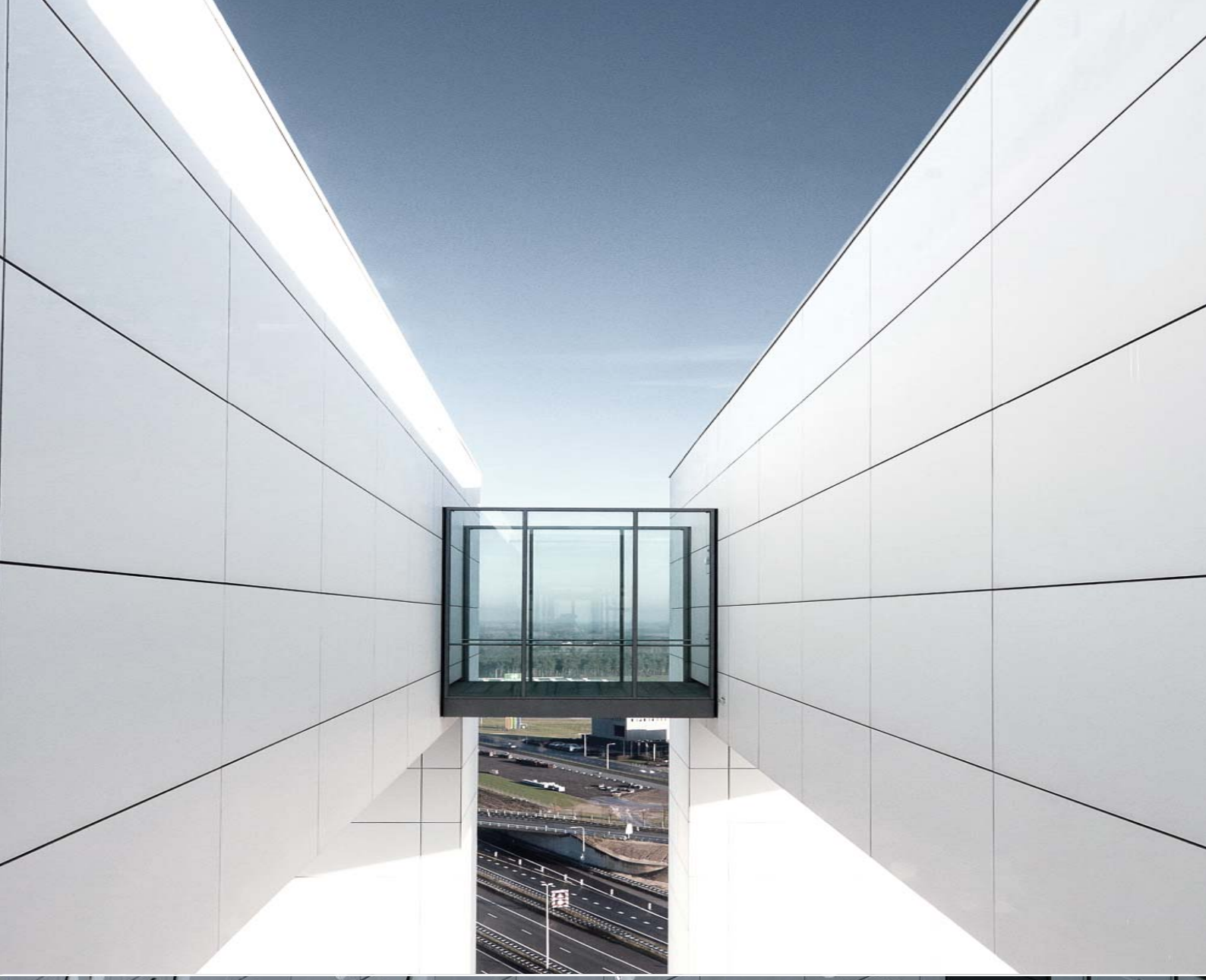
Graffiti can be removed with dedicated graffiti removers. Cleaners with volatile solvents should not be used. Below is a selection of appropriate graffiti removers. The application instructions of the manufacturers should be followed precisely, e.g.

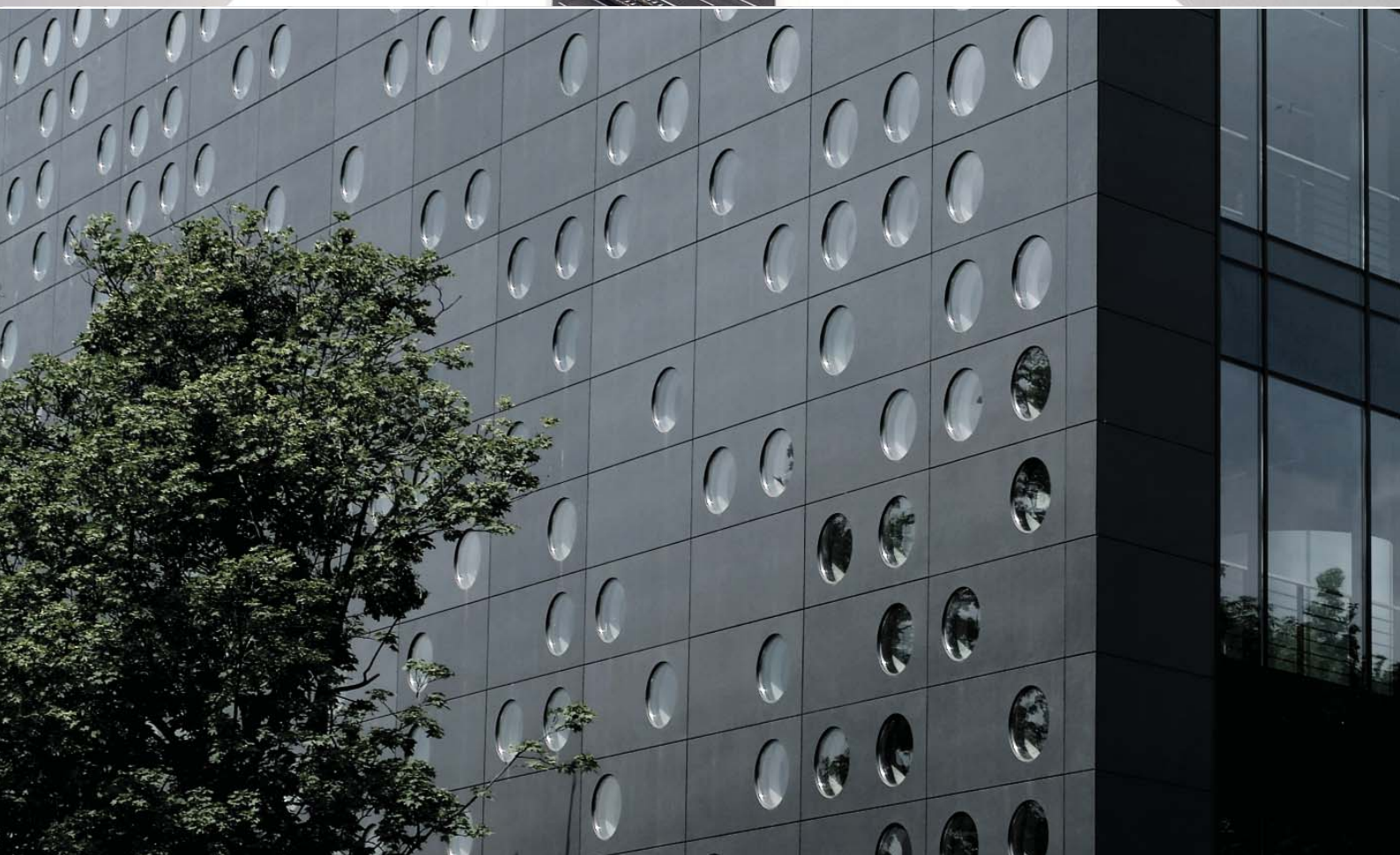
- Costec Technologies and Cleaner Liquid Cleaner Technologies, www.costec.eu
- Scribex P3 400, www.henkel.de
- Rapidly 031, e-mail: pregernig@t-online.de

NOTE: When an on-site graffiti protection is applied to the panels the appearance of the panel may change as the protection effects the light reflectance of the panel's colour.

Cleaning

There are two methods of cleaning facades, mechanical cleaning and chemical cleaning. In principle, perform the cleaning of the facade over the entire surface, because partial cleaning can result in colour and tonal imbalance. Normal stains can be removed with a sponge and water. The use of abrasive materials such as scourers and steel wool etc is not permitted, as these leave irreparable scratches on the panel surface.





- Eternit Asia Panels warrants its EQUITONE materials to remain free of defects in material and manufacture for 10 years from date of purchase. In the event of any failure of the products caused by the direct result of a defect in the material or manufacture of the product, Eternit Asia Panels will at its option replace or repair, supply an equivalent product, or pay for doing one of these.

- This warranty does not apply where the product has been used in any manner not in accordance with the manufacturer's instructions, nor the reuse of the product after its initial installation. This includes installation and maintenance in accordance with this technical manual. Eternit Asia Panels recommends that only those products, components and systems recommended by it, be used. The project must be designed and constructed in strict compliance with all relevant provisions of the current Building Code of Australia, regulations and standards.

- All other products, including coating systems, applied to or used in conjunction with the product must be applied or installed and maintained in accordance with the relevant manufacturer's instructions and good trade practice. Eternit Asia Panels will need to be satisfied that any defect in its product is attributable to material or manufacture defect (and not another cause) before this warranty applies.

- Notification of a warranty claim must be made to Eternit Asia Panels prior to any return or attempted repair of the product. Failure to allow Eternit Asia Panels to examine an alleged faulty product in situ may result in the voiding of this warranty.

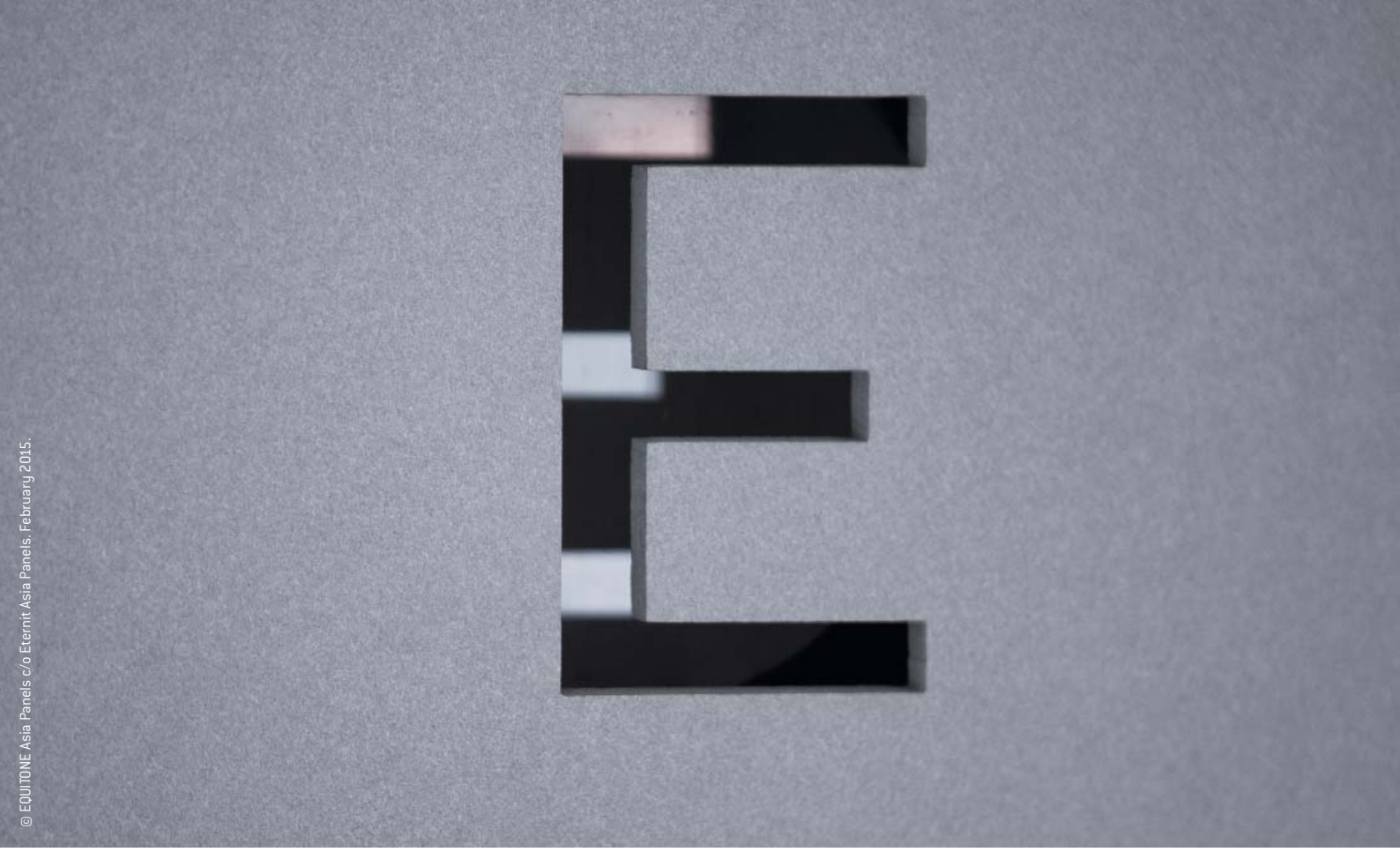
- Eternit Asia Panels will not be liable for any claims, defects or damages arising from or in any way attributable to poor design or detailing, poor workmanship, movement of materials to which the product is attached and/or incorrect design of the structure settlement or structural movement, high levels of pollution and/or acts of God. The latter includes but is not limited to floods, cyclones, earthquakes, other severe weather or unusual climatic conditions and/or performance of paint/coatings applied to the product and/or normal wear and tear.

- Other than as expressly set out in this warranty, and the guarantees that cannot be excluded under Australian Consumer Law "Schedule 2 of the Competition and Consumer Act 2010 (Cth)" (and any other law), Eternit Asia Panels excludes all other warranties and guarantees with regard to product, including all guarantees and warranties that might apply by law.

- To the extent that it is able to do so, Eternit Asia Panels excludes all liability for loss and damage (including consequential loss) in connection with the product. This exclusion does not apply where the product is sold to a consumer and is a good of a kind ordinarily acquired for personal, domestic or household use or consumption.

- The following statement is provided where the product is supplied to a buyer who is a "consumer" under Australian Consumer Law:
  a) Eternit Asia Panels products and systems come with guarantees that cannot be excluded under Australian Consumer Law.
  b) Users of Eternit Asia Panels goods are entitled:
    i) to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage, and
    ii) to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

- The benefits of this warranty are in addition to other rights or remedies of the consumer under law in relation to the goods or services to which the warranty relates.



EQUITONE

Fibre cement facade materials

www.equitone.com

EQUITONE Asia Pacific

info.asia@equitone.com
info.australia@equitone.com

1. Product Appearance

EQUITONE [tectiva] is a through coloured panel with no coating. As the panel has an honest, pure and natural appearance, colour differences are possible. The surface of the sheet is characterised by fine sanding lines and white spots. The rear receives no back-sealing coating. The board receives a hydrophobation which prevents moisture ingress into the core of the panel.

2. Colour

The colour is throughout the sheet. Natural colour differences, possibly accentuated by the orientation of the sheet, the viewing angle and the effects of light and moisture, are possible. The sheet becomes a little lighter with aging. The surface of the sheet is characterised by fine sanding lines and white lines and other inclusions.

It is not possible to realistically show available colours in literature, therefore the final choice of colours should be made with samples. The risk of colour differences between the various sheets decreases when the whole quantity is ordered at once.

Colour differences are measured according to a simplified CIELAB colour model, by which only the lightness of the colour is checked. Tolerated colour differences on a face are $\Delta L = \pm 5.0$ based of 5 measurements.

3. Product Composition

EQUITONE [tectiva] sheets consist of the following:

- Portland cement
- Selected mineral fillers providing extra smooth surface
- Organic reinforcing fibres
- Mineral and organic pigments
- Functional additives

4. Production Method

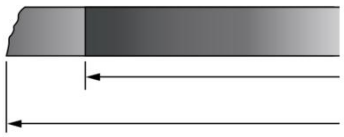
EQUITONE [tectiva] sheets are manufactured on a Hatschek machine, are double pressed, autoclaved calibrated and sanded. Afterwards EQUITONE [tectiva] is made water repellent on the front and back by means of a hydrofobation.

EQUITONE
Fibre cement facade materials

For further information, please contact
Email: info.australia@equitone.com www.equitone.com
EQUITONE Australia, Suite 201/198 Harbour Esplanade, Docklands, 3008 Vic, Australia

5. Dimensons

EQUITONE [tectiva] is available in 8mm thickness. The panels are available in either untrimmed or trimmed formats. The untrimmed (raw) panel needs to be trimmed by approximately 10mm on all edges. The panel should not be installed with untrimmed edges.

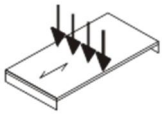


Dimensions

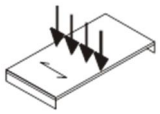
Not rectified untrimmed	2520mm x1240mm	3070mm x 1240mm
Rectified trimmed	2500mm x 1220mm	3050mm x 1220mm

6. Technical Properties

EQUITONE [tectiva] cladding panels conform to the requirements of EN 12467:2012+A1 2016 “Fibre-cement flat sheets – Product specification and test methods“. The results below are presented as defined by the standard.



Load perpendicular to the production direction



Load parallel to to the production direction

Technical Properties

Miniumum Density	Dry	EN12467	1580	kg/m³
Characteristic bending strength perpendicular	ambient	EN12467	32.0	N/mm²
Characteristic bending strength parallel	ambient	EN12467	22.0	N/mm²
Mean module of elasticity	ambient	EN12467	14,000	N/mm²
Hygric movement (RH)	30-90%	-	<0.80	mm/m
Hygric movement (RH) oven dry to saturated	0-100%	-	1.6	mm/m
Water absorption of uncoated panels	0-100%	-	<25	%

Classification

Durability classification	EN12467	Category A
Strength classification	EN12467	Class 5
Reaction to fire	EN13501	A2-s1,d0

Extra tests

Water impermeability test	EN12467	Pass	
Warm water test	EN12467	Pass	
Soak-dry test	EN12467	Pass	
Freeze-thaw test for category A panel	EN12467	Pass	
Heat-rain tests for category A panel	EN12467	Pass	
Dimensional tolerances for Level 1 panel	EN12467	Pass	
Thermal movement	-	0.01	mm/mK
Thermal conductivity	-	0.39	W/mK

Panel Weight (air dried)

Panel	Weight	2500mm x 1220mm	3050mm x 1220mm
8mm	14.9 kg/m²	45.4 kg	55.4 kg

Tolerances rectified trimmed

Thickness	8mm ± 0.5mm.
Length	± 3mm
Width	± 3mm
Squareness	± 1.0mm/m

7. Advantages

Providing the application guidelines are followed, EQUITONE fibre-cement sheets have the following superior mix of properties compared to other materials:

- fire safe (no fire ignition, no spread of fire)
- sound insulating
- resistant to extreme temperatures
- water resistant (if in compliance with application guideline)
- resistant to many living organisms (fungi, bacteria, insects, vermin, etc.)
- resistant to many chemicals
- environmentally friendly, no harmful gas emissions

In addition, EQUITONE [tectiva] has the following specific properties:

- Strong and rigid sheet
- Smooth aesthetic surface with natural hues
- Natural pure colour

8. Applications

EQUITONE [tectiva] can be used in the following applications:

- Façade: Rear ventilated façade cladding and detailing to window and doors
- Exterior ceiling: decorative cladding of ceiling
- Weatherboarding
- Eaves and verge boards
- Interior wall lining

9. Health and Safety Aspects

During the mechanical machining of panels, dust can be released which can irritate the airways and eyes. The inhalation of fine (respirable size) quartz containing dust, particularly when in high concentrations or over prolonged periods of time can lead to lung disease and an increased risk of lung cancer. Depending on the working conditions, adequate machinery with dust extraction and/or ventilation should be foreseen. For more information, please check the Safety Data Sheet (based on 1907/2006/EC, article 31).

EQUITONE [tectiva] is certified with an Environmental Product Declaration according to ISO 14025 (available from local support).

The life cycle assessment includes raw material and energy production, the actual manufacturing phase, and the use phase of the fibre cement panels.

10. Maintenance and Cleaning

For minor soiling, washing with a mild household detergent or soft soap solution followed by rinsing with clear water.

11. Certification

The manufacturer can - within the framework of the European Regulation N° 305/2011 (CPR) - present the Declaration of Performance (DOP) of the product such confirming that the product has a CE marking. The CE marking guarantees that the product is in accordance with the basic requirements determined by the harmonized European standard and applicable to the product.
The Declaration of Performance is presented in accordance with the CPR and can be found at www.infodop.com. The manufacturer is also ISO certified.

12. Information

Information on the different applications can be found in the Etex Façade application guidelines. They can be found on the website or can be obtained from local support. Information about external suppliers can also be downloaded from the local websites.

Certificate of Conformity

Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia

Tel: +61 (0)2 9886 0222 - www.Global-Mark.com.au

Certificate Holder:
Knauf Insulation Pty Ltd
Unit 2
44 Borthwick Avenue
Murarrie, QLD, 4172

Tel: +61 7 3393 7300

Web: www.knaufinsulation.com.au

Certificate number: CM30094 Rev1

THIS TO CERTIFY THAT

Earthwool® Glasswool Insulation

Type and/or use of product:	**Description of product:**
Non-combustible thermal insulation for residential and commercial construction.	Earthwool® is a mineral fibre type bulk insulation supplied as batts or rolls, and thickness between 50 mm and 275 mm, and nominal density between 8 kg/m^3 and 30 kg/m^3.

COMPLIES WITH THE FOLLOWING BCA PROVISIONS AND STATE OR TERRITORY VARIATION(S) — **BCA (2016)**

	Volume One – including Amendment 1		**Volume Two**	
Performance Requirement(s)	**FP1.4**	Weatherproofing	**P2.2.2**	Weatherproofing
	FP1.5	Rising damp	**P2.2.3**	Rising damp
	GP2.1	Combustion appliance	**P2.3.3**	Heating appliances
	GP5.1	Construction in Bushfire Prone Areas	**P2.3.4**	Buildings in bushfire areas
Deemed-to-Satisfy Provision(s):	**A1.1**	Non-combustible	**1.1.1.2**	Non-combustible
	C1.9	Non-combustible building elements	**3.7.1.8**	Separating walls
	C1.14	Ancillary elements	**3.12.1.1**	Building fabric thermal insulation
	J1.2	Thermal construction – general		

Scope of certification: The CodeMark Scheme is a building product certification scheme. The rules of the Scheme are available at the ABCB website www.abcb.gov.au. This Certificate of Conformity is to confirm that the relevant requirements of the Building Code of Australia (BCA) as claimed against have been met. The responsibility for the product performance and its fitness for the intended use remain with the certificate holder. The certification is not transferrable to a manufacturer not listed on Appendix A of this certificate.

Disclaimer: The Scheme Owner, Scheme Administrator and Scheme Accreditation Body do not make any representations, warranties or guarantees, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained within this certificate; and the Scheme Owner, Scheme Administrator and Scheme Accreditation Body disclaim to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages and costs arising as a result of the use of the product(s) referred to in this certificate.

The purpose of Global-Mark **construction site audits** is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions

In placing **the CodeMark mark** on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein. In issuing this Certificate of Approval Global-Mark has relied on the **expertise of external bodies** (laboratories, and technical experts).

Herve Michoux
Global-Mark Managing Director

Peter Gardner
Unrestricted Building Certifier

Date of issue: 06/07/2018

Date of expiry: 06/07/2021

State or territory variation(s):	**SA FP1.5**		**NSW P2.2.3**	
	NSW GP5.1		**SA P2.2.3**	
	Qld GP5.1		**Tas P2.3.3(c)**	
	Tas GP5.1		**Tas P2.3.4**	
	NSW J(A)1		**NSW 3.7.1.8(b)**	
	NT Section J		**NSW 3.12**	
	Qld Section J		**NT 3.12**	

SUBJECT TO THE FOLLOWING LIMITATIONS AND CONDITIONS AND THE PRODUCT TECHNICAL DATA IN APPENDIX A AND EVALUATION STATEMENTS IN APPENDIX B

Limitations and conditions:

1. Installation shall be carried out by an accredited installed in accordance with AS 3999:2015 and the relevant installation guide as specified in section A5.
2. Installation shall be carried out only after the building is waterproof, and after the materials within the building have dried to a sufficient degree that moisture is not transported into the insulation material.

Building classification/s: All classes

APPENDIX A – PRODUCT TECHNICAL DATA

A1 Type and intended use of product

Bulk thermal insulation for roofs, ceilings, external walls, internal walls and floors.

A2 Description of product

Earthwool® is a mineral fibre type bulk insulation complying with AS/NZS 4859.1:2002 (incorporating Amendment No.1). It is manufactured with recycled glass and ECOSE® Technology binder which is created from renewable materials. The product types and special characteristics are listed below:

- Earthwool® Acoustic Batts – Basic at 11 kg/m^3, Ultra at 14 kg/m^3, High-Density at 17 kg/m^3, 20 kg/m^3 and 27 kg/m^3
- Earthwool® Acoustic Roll – Basic at 11 kg/m^3, High-Density at 24 kg/m^3
- Earthwool® Ceiling Batts
- Earthwool® Multi-Use Rolls
- Earthwool® Roof Blanket – has optional foil backing
- Earthwool® Underfloor Roll – faced with a black glass wind wash barrier
- Earthwool® Wall Batts

A3 Product specification

Binder content no greater than 8%

Specification of Earthwool® glasswool insulation shall be in accordance with the following documents:

- Knauf Insulation Earthwool® Product Price List, Ref.: KIAU1115282BR, 2014
- Knauf Insulation Earthwool® Product Datasheets as follows:
    - Earthwool® Acoustic Batts, Ref.: KIAU0315172DS, October 2015
    - Earthwool® Acoustic Roll, Ref.: KIAU0315172DS, October 2017
    - Earthwool® Ceiling Batts, Ref.: KIAU0315174DS, January 2017
    - Earthwool® Multi-Use Rolls, Ref.: KIAU0616395DS, May 2017
    - Earthwool® Roof Blanket, Ref.: KIAU0515198DS, January 2017
    - Earthwool® Underfloor Roll, Ref.: KIAU0115154DS, October 2015
    - Earthwool® Wall Batts, Ref.: KIAU0315172DS, January 2017

Also refer to Knauf Insulation Material Safety Datasheet – Glass Mineral Wool with ECOSE® Technology [October 2014].

Table A1 provides a summary of the specification information for the relevant Earthwool products.

Table A1: Product Specification Summary

Acoustic Batts 11kg/m³

Material Code	Thickness (mm)	Density (kg/m³)	Est.R-value (m²K/W)	Width (mm)	Length (mm)
290594	50	11	1.2	430	1160
248352				580	1160
290599	75	11	1.8	430	1160
290600				580	1160
248361	50	11	1.2	450	2700
248360				600	2700
248362	75	11	1.8	450	2700
2437819				600	2700
546373	110	11	2.5	600	1160

Acoustic Batts 14 kg/m³

Material Code	Thickness (mm)	Density (kg/m³)	Est.R-value (m²K/W)	Width (mm)	Length (mm)
2437822	50	14	1.3	430	1160
2438637				580	1160
2438916	75	14	1.9	430	1160
2438638				580	1160
2437560	50	14	1.3	450	1160
2437561				600	1160
2437562	75	14	1.9	450	1160
2437563				600	1160

High Density Acoustic Batts

Material Code	Thickness (mm)	Density (kg/m³)	Est.R-value (m²K/W)	Width (mm)	Length (mm)
244462	75	17.0	2.0	430	1160
2438626				580	1160
2437532	90	20.0	2.5	430	1160

2437533				580	1160
248357	50	24.0	1.4	580	1160
256736	90	27.0	2.7	430	1160
251511				580	1160

Wall Batts

Material Code	Thickness (mm)	Density (kg/m³)	R-value (m²K/W)	Width (mm)	Length (mm)
243521	75	8.1	1.5	430	1160
243523				580	1160
244462	75	17.0	2.0	430	1160
2438626				580	1160
2437523	90	9.5	2.0	430	1160
2437528				580	1160
2437532	90	20.0	2.5	430	1160
2437533				580	1160
256735	90	27.0	2.7	430	1160
252511				580	1160

Wall Batts - Metal Frame

Material Code	Thickness (mm)	Density (kg/m³)	R-value (m²K/W)	Width (mm)	Length (mm)
2437522	75	8.1	1.5	450	1200
2437524				600	1200
2438628	75	17.0	2.0	450	1200
2438629				600	1200
2437526	90	9.5	2.0	450	1200
2437529				600	1200

Ceiling Batts

Material Code	Thickness (mm)	Density (kg/m³)	R-value (m²K/W)	Width (mm)	Length (mm)
2437530	125	7.4	2.5	430	1160
2437531				580	1160

2437530	145	8.0	3.0	430	1160
2437535				580	1160
2437538	175	7.3	3.5	430	1160
2437539				580	1160
2437542	195	7.8	4.0	430	1160
2437541				580	1160
2437544	210	11.4	5.0	580	1160
2437543				430	1160
2437546	275	9.0	6.0	580	1160
2437545				430	1160

Roof Blanket

Material Code	Thickness (mm)	Density (kg/m³)	R-value (m²K/W)	Width (mm)	Length (mm)
461848	55	12.0	1.3	1200	37000
497338	60	12.8	1.5	1200	28000
472959	75	11.6	1.8	1200	23000
474347	100	10.0	2.3	1200	17500
474350	105	11.0	2.5	1200	16500
474352	120	13.0	3.0	1200	14500
429752	130	12.7	3.2	1200	16500

Multi-Use Roll

Material Code	Thickness (mm)	Density (kg/m³)	R-value (m²K/W)	Width (mm)	Length (mm)
253095	90	9.5	2.0	430	19000
253093				580	19000
432158	90	20.0	2.5	430	12500
432159				580	12500

A4 Manufacturer and manufacturing plant(s)

- St Helens, PO Box 10, Stafford Road, Merseyside WA 10 3NS, UK
- Cwmbran NP44 2YQ, TOF, UK
- 3100 Ashby Road, Shasta Lake, California, 96019, USA
- 75. Yıl Mahallesi 1. Cadde 1/G – Küçük Organize, Sanayi 26250 Eskişehir Turkey

A5 Installation requirements

Installation shall be carried out in accordance with AS3999:2015 and the relevant Knauf Earthwool installation instruction documents listed below and which are available at www.knaufinsulation.com.au/resources :

- Installation Instructions – Earthwool® Ceiling Batts
- Installation Instructions – Earthwool® Ceiling Rolls
- Installation Instructions – Earthwool® Glasswool Insulation Underfloor Batts
- Installation Instructions – Earthwool® Insulation Underfloor Roll
- Installation Instructions – Earthwool® Wall Batts

A6 Other relevant technical data

Any referenced documents within the technical literature identified in Appendix A, A3 and Appendix A, A5.

APPENDIX B – EVALUATION STATEMENTS

B1 Evaluation methods

The following assessment methods have been used to determine compliance with NCC 2016 (+A1):

Code Clause	Assessment Method(s)	Evidence of suitability	Evidence reference in B2
Volume One A1.1	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 1 to 4
Volume One C1.9	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 1 to 4
Volume One C1.14	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 1 to 4
Volume One FP1.4	Volume One A05(a)	Volume One A2.2(a)(vi) – Another form of documentary evidence	Item 12and item 13
Volume One FP1.5	Volume One A05(a)	Volume One A2.2(a)(vi) – Another form of documentary evidence	Item 12
	Volume One A0.5(d)	Comparison with the Deemed-to-Satisfy Provisions	Item 13
Volume One GP2.1	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 1 to 4
Volume One GP5.1	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 1 to 4
Volume One J1.2	Volume One A05(a)	Volume One A2.2(a)(iv) – Report issued by a registered testing authority	Items 5 to 11
Volume Two 1.1.1.2	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 1 to 4
Volume Two P2.2.2	Volume Two 1.0.5(d)	Comparison with the Deemed-to-Satisfy Provisions	Item 12
	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(vi) – Another form of documentary evidence	Item 13
Volume Two P2.2.3	Volume Two 1.0.5(d)	Comparison with the Deemed-to-Satisfy Provisions	Item 13
	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(vi) – Another form of documentary evidence	Item 12
Volume Two P2.3.1	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 1 to 4
Volume Two P2.3.3	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 1 to 4
Volume Two P2.3.4	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 1 to 4
Volume Two 3.7.1.8	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 1 to 4
Volume Two 3.12.1.1	Volume Two 1.0.5(a)	Volume Two 1.2.2(a)(i) – Report issued by a registered testing authority	Items 5 to 11

B2 Reports

The following reports have been used as evidence to determine compliance with NCC 2016 (+A1):

Ref	Author	Reference	Date	Description	NATA Registration
1	Exova Warringtonfire, UK	Report No. WF 388511	7/09/2017	Classification of reaction to fire performance in accordance with EN 13501:2007+A1:2009 – product reference "SK Dritherm Cavity Slab 100mm"	ilac-MRA via. UKAS – Accreditation Number 0249
2	Exova Warringtonfire, UK	Document Reference: 311313	27/09/2011	Fire Test For Non-Combustibility Of Building Products – product reference "HD-32-8-ET", 80mm thickness, 32 kg/m^3 density	ilac-MRA via. UKAS – Accreditation Number 0249
3	Exova Warringtonfire, UK	Document Reference: 311316	27/09/2011	Determination Of The Heat Of Combustion For Building Products – product reference "HD-32-8-ET", 80mm thickness, 32 kg/m^3 density	ilac-MRA via. UKAS – Accreditation Number 0249
4	CSIRO	Assessment Number: FCO-3073 (Revision A)	28/08/2014	Likely fire performance of Knauf Earthwool glass mineral wool insulation	Accreditation Number 165
5	BRANZ	Project Number: DI0367 Test Reference: DU02 Test Reference: DU03 Test Reference: DU04 Test Reference: DU05 Test Reference: DU06 Test Reference: DU07 Test Reference: DU08	 27/08/2013 28/08/2013 18/10/2013 8/10/2013 19/09/2013 4/09/2013 30/08/2013	Thermal Resistance of Earthwool Australia products as follows: Earthwool roll – 60mm R1.5 Earthwool roll – 75mm R1.8 Earthwool roll – 90mm R2.5 Earthwool roll – 90mm R2.1 Earthwool roll – 100mm R2.3 Earthwool roll – 120mm R3.0 Earthwool roll – 130mm R3.2	ilac-MRA via. IANZ – Accreditation Number 37
6	BRANZ	Project Number: DI0450 Test Reference: DU05 Test Reference: DU06	 16/04/2014 17/04/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – 90mm R2.1 Earthwool batts – 90mm R2.5	ilac-MRA via. IANZ – Accreditation Number 37
7	BRANZ	Project Number: DI0463 Test Reference: DU01 Test Reference: DU02 Test Reference: DU04 Test Reference: DU05	 14/05/2014 14/05/2014 20/05/2014 29/05/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – 90mm R2.7 Earthwool batts – 90mm R2.6 Earthwool batts – Sound Control 75mm R1.9 Earthwool batts – Sound Control 50mm R1.2	ilac-MRA via. IANZ – Accreditation Number 37
8	BRANZ	Project Number: DI0490 Test Reference: DU02	 1/10/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – Sound Absorbing 50mm R1.3	ilac-MRA via. IANZ – Accreditation Number 37
9	BRANZ	Project Number: DI0436 Test Reference: DU01 Test Reference: DU02 Test Reference: DU03	 1/04/2014 7/04/2014 3/04/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – 210mm R5.0 Earthwool batts – 195mm R4.0 Earthwool batts – 175mm R3.5	ilac-MRA via. IANZ – Accreditation Number 37

Ref	Author	Reference	Date	Description	NATA Registration
10	BRANZ	Project Number: DI0448 Test Reference: DU01 Test Reference: DU02 Test Reference: DU04	 1/04/2014 1/04/2014 11/04/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – 75mm R2.0 Earthwool batts – 90mm R2.0 Earthwool batts – 145mm R3.0	ilac-MRA via. IANZ – Accreditation Number 37
11	BRANZ	Project Number: DI0450 Test Reference: DU01 Test Reference: DU03	 10/04/2014 22/04/2014	Thermal Resistance of Earthwool products as follows: Earthwool batts – 75mm R1.5 Earthwool batts – 275mm R6.0	ilac-MRA via. IANZ – Accreditation Number 37
12	Standards Australia	AS/NZS 4859.1:2002 (Incorporating Amendment No. 1)	2006	Materials for the thermal insulation of buildings – Part 1: General criteria and technical provisions	Not applicable
13	Standards Australia	AS 3999:2015	2015	Bulk thermal insulation - Installation	Not applicable

TBA FIREFLY NON-COMBUSTIBLE SARKING-BREATHABLE

Sarking Insulation Satisfying Non-Combustible Construction Requirements

PRODUCT DESCRIPTION AND TYPICAL APPLICATIONS

TBA Firefly Breathable Non-Combustible Sarking is an Extra Heavy Duty radiant barrier consisting of a layer of woven glass fabric with aluminium foil laminate. It is designed to be used as a water barrier vapour permeable membrane or reflective insulation in commercial wall applications with a requirement for non-combustible materials or construction in accordance NCC 2016, BCA Volume 1 amendment 1, C1.9. With superior tensile strength and tear resistance it provides a robust barrier to dirt, dust, draughts, wind driven rain and is suitable for use in bush fire prone areas to provide protection against burning embers. TBA Firefly Breathable Non-Combustible Sarking integral thermal insulation properties contribute to minimising heat gain and heat loss. As a vapour permeable membrane this product may be incorporated into designs to control condensation. TBA Firefly Breathable Non-Combustible Sarking has been tested in accordance with AS 1530.1 and AS1530.3 and may be used in non-combustible construction where there is a requirement to construct wholly of materials that are not deemed combustible.

TBA Firefly Breathable Non-Combustible Sarking meets the non-combustible insulation and material requirements of NCC 2016, Vol. 1 amendment 1, C1.9 and satisfies:

- C1.13(d) Fire Protected Timber: Concession.
- C2.10(ii)(B) Separation of Lift Shafts,
- Spec.C1.1,2.2 Support of another part,
- Spec.C1.1,2.5 Curtain walls and wall panels,
- Spec.C1.1,2.9(ii)(C) Residential aged care building,

TYPE A FIRE-RESISTING CONSTRUCTION:

- Spec.C1.1,3.1(b) external walls and common walls,
- Spec.C1.1,3.1(d)(iii)(D) load bearing walls,
- Spec.C1.1,3.1(e) non-load bearing internal walls,
- Spec.C1.1,3.10(a)(ii, iii & v) non-combustible material,
- Spec.C1.1,3.10(c)(ii)(C) non-combustible insulation.

TYPE B FIRE-RESISTING CONSTRUCTION:

- Spec.C1.1,4.1(b) external walls and common walls,
- Spec.C1.1,4.1(e)(iii)(D) load bearing walls,
- Spec.C1.1,4.3(a)(ii, iii & v) non-combustible material,
- Spec.C1.1,4.3(c)(ii)(C) non-combustible insulation,
- Spec.2.5,2(a) non-combustible smoke-proof walls,
- NSWC2.5(b)(iii)(B) non-combustible insulation.

KEY BENEFITS

· Pliable yet extremely strong and easy to use
· Provides ongoing physical protection against the elements
· Reduces temperature variations to increase energy efficiency
· Non-Combustible
· High water resistance
· Extra Heavy Duty
· Soft facings reduce flapping noise

PHYSICAL CHARACTERISTICS

Width: 1250mm
Length: 50m
Thickness: 0.2mm
m2 per roll: 63.5
Weight per roll (kg): 14.5
Product Code: EKA161/1.27m-B

When required, TBA "Class O Fire Rated Aluminium Tape", 75mm x 50m, shall be used to seal joints between adjacent runs of TBA Firefly Breathable Non-Combustible Sarking.

TBA Protective Technologies
Australia Head Office
Unit 12, 8 Leighton Place
Hornsby, NSW, 2077

TBA Firefly Head Office
P.O. BOX 52
Laidley
QLD, 4341
Australia

Contact Us
Phone: (07) 5411 4209
Mobile: 0400 966 899
Email: trevor@tbafirefly.com.au

GENERAL INSTALLATION ADVICE

As a secondary lining material TBA Firefly Breathable Non-Combustible Sarking is not designed to withstand prolonged or direct exposure to UV or the weather. External cladding materials must be applied within 4 weeks of installation TBA Firefly Breathable Non-Combustible Sarking shall be installed in accordance with AS/NZS 4200.2:1994 Pliable Building Membranes & Underlays, Part 2 Installation Requirements with the non-reflective surface facing outwards. Proprietary cladding systems will provide specific installation instructions to achieve their fire/acoustic/thermal/weatherproofing performance requirements. TBA Firefly Breathable Non-Combustible Sarking is designed to be compatible with these types of systems. Please contact our technical team if guidance on proprietary installation instructions is required. TBA Firefly Breathable Non-Combustible Sarking should be installed in horizontal runs across the wall starting at the bottom plate. To form a continuous membrane over the entire area of the wall successive runs shall either be taped at joints or shall overlap the lower run by 150mm. For wall applications, affix to framing members using either battens or Hammer Tacker with 10mm staples at maximum 600mm centres. At least one fastener per stud shall be provided at laps. Taping of joints, penetrations and discontinuities is recommended to provide draught sealing. An air space of minimum 20mm thickness adjacent to the reflective face is required to achieve contribution as thermal insulation.

PROPERTY	TEST	RESULT
Combustibility	AS1530.1-1994 -Fortiglas layer -Aluminium layer AS1530.3 - Bonded laminated material	 Non-Combustible Non-Combustible PASS Meets C1.9 NCC Vol 1 amendment 1
Flammability Index	AS1530.2-1993	1 (low)
Early Fire Hazard properties	AS/NZS1530.3-1999	0,0,0,1
Duty Classification	AS/NZS4200.1-1994 Table 1	Extra Heavy Duty
Edge Tear Resistance	AS/NZS4200.1 Cl.6.1.3 (TAPPI T470)	MD 193 (N/25mm) EHD LD 157 (N/25mm) EHD
Tensile Strength	AS/NZS4200.1 (AS1301.448s-1991	MD 28.3 (kN/m) MD LD 19.7 (kN/m) MD
Resistance to Dry Delamination	AS/NZS4201.1-1994	PASS
Resistance to Wet Delamination	AS/NZS4201.2-1994	PASS
Shrinkage	AS/NZS4201.3-1994	0.0%
Water Barrier	AS/NZS4201.4-1994	Unclassified
Absorbancy	AS/NZS4201.6-1994	Unclassified (45.7g/m2)
Vapour Permeance	ASTM E96	0.370 µg/N.s
Vapour Barrier classification	ASTM E96	LOW
pH of Extract	AS2001.3.1-1998	pH 6
Surface Corrosion and Wet Delamination	AS/NZS4859.1-2002 App I	PASS
Infra-red Emittance	ASTM E408	0.05 (foil surface)

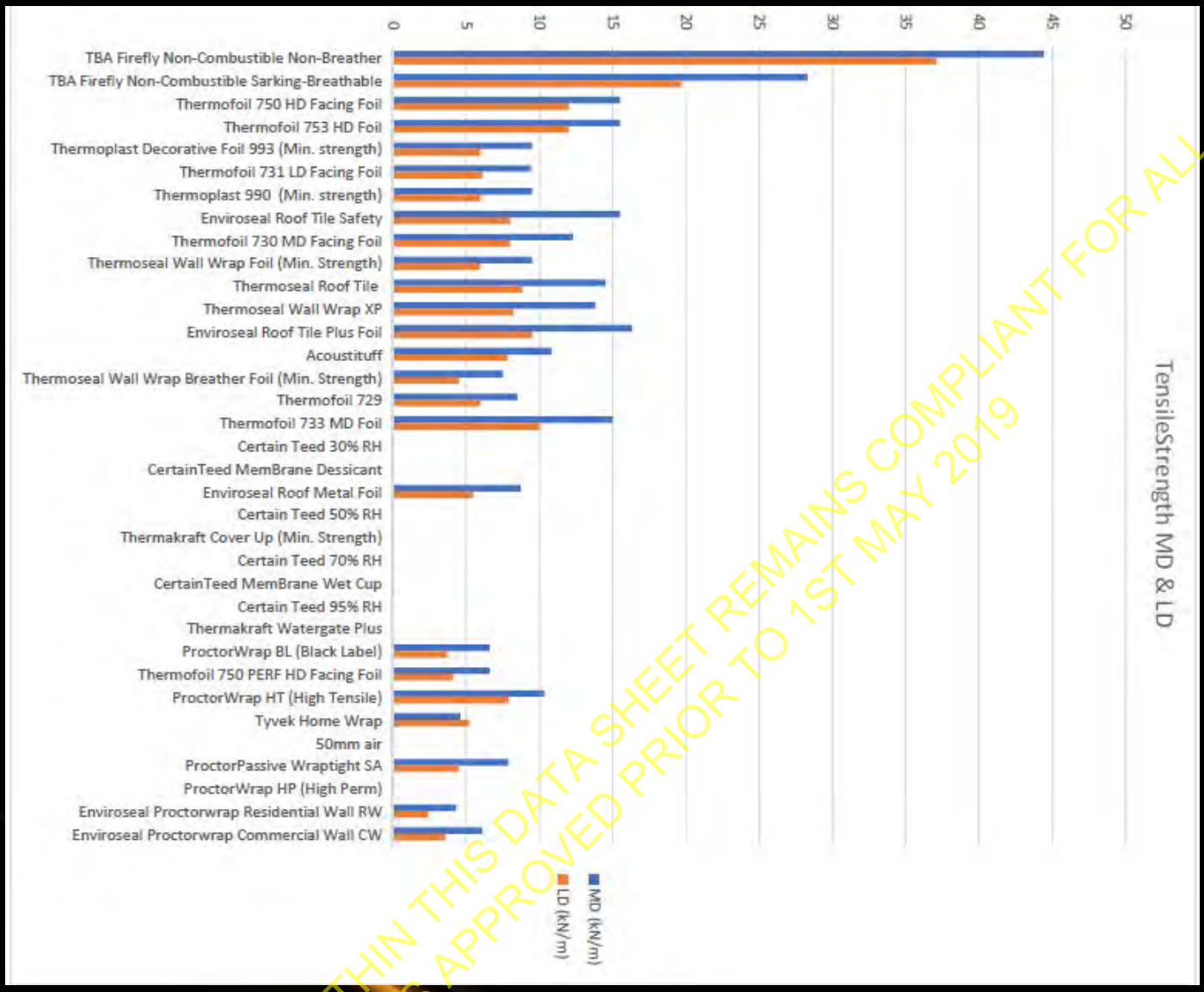
SPECIFICATION NOTES

TBA Firefly Breathable Non-Combustible Sarking 1250mm x 50m, tested in accordance with AS 1530.1 to satisfy the requirements of NCC 2016, BCA Volume 1, C1.9 for non-combustible construction.

· Location in building and description of work
· Installed in accordance with manufacturers' instructions.

TENSILE STRENGTH COMPARISON OF SARKING PRODUCTS TESTED TO

AS/NZS 4200.1-1994 Clause 6.1.2



TBA FIREFLY PRODUCE SOLUTIONS NOT EXCUSES PROTECTING

PEOPLE

BUILDING FACADES

FIRE TRUCKS

BATTLESHIPS

WHICH IS WHY OUR SARKING MEETS THE NON-COMBUSTIBILITY REQUIREMENTS FOR WALL SYSTEMS OF ALL TYPE A AND B CONSTRUCTION

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