



Uni-TWS® Manual

Unitex®

BUILD YOUR DREAM



GENERAL DESCRIPTION

The Unitex® Thermal Wall System (Uni-TWS®) is an external wall system designed to provide thermal wall insulation with strength and aesthetic appeal.

The system is comprised of a number of components. When the specified components are combined in the prescribed manner a strong, durable and attractive insulating wall structure will result.

This manual provides details on the specifications of the components (Section: 1), and on the application of these components (Section: 2). Included are diagrams and drawings which further illustrate the correct fixing, etc. techniques.

The CSIRO Department of Manufacturing and Infrastructure Technology has independently tested Uni-TWS®. The results are detailed in the CSIRO Appraisals Technical Assessment #310.

This CSIRO Appraisals report provides details of and comments on the results obtained from the tests carried out. The important properties evaluated in the series of tests are: Thermal Insulation (R-value), Waterproofing, Fire Resistance and Strength.

Uni-TWS® is a thermal insulating wall system unique to Unitex® with some integral components under patent protection.

The performance of the system is warranted for seven years – against product defect only - so long as the integrity of the system is maintained. This means that all the components must comply with the Unitex® specifications and the system must be installed according to the Unitex® application instructions, including construction drawings.

This warranty is not a structural warranty. Movement of the substrate, framing, soil, etc. can result in damage (e.g. cracking) of the Uni-TWS® surface. Such damage is beyond the control of Unitex® and clearly is not a fault of the system.

Similarly insufficient or inadequate construction control joints (which help to compensate for movement) could also lead to cracking of the Uni-TWS®. Again this is not covered by the warranty, as the placing of control joints is the ultimate responsibility of the builder/engineer/specifier.

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INDIVIDUAL COMPONENTS

Uni-IB Board

The substrate component of the Uni-TWS® is a sheet of expanded polystyrene foam (EPS). The EPS comes in three thicknesses - 50mm, 75mm and 100mm, - +/-2.0mm.

The most commonly used thickness is 75mm.

The standard sheet size is 1200 x 2400mm. Other sizes can be supplied to customer's specifications.

The EPS used is 'SL' Grade made according to AS 1366, Part 3 – 1992. The grade used must have a minimum bead fusion of 50%. It must contain a fire retardant additive as an integral part of the EPS. The relevant Australian Standard is AS/NZ 1530.3: 1999 Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release.

The EPS must comply with the following physical properties:

Physical Property	Unit	Spec.	Test Method
Compressive Stress at 10% deformation, minimum	kPa	70	AS2498.3
Cross-breaking strength; minimum	kPa	135	AS2498.4
Rate of water vapour transmission; maximum – measured parallel to rise at 23°C	ug/m ² s	630	AS2498.5
Dimensional stability of length; maximum: - at 70°C, dry conditions; 7 days	%	1.0	AS2498.6
Thermal resistance at a mean temp. of 25°C (50mm sample)	m ² K/W	1.13	AS2464.5 or AS2464.6
Bead Fusion: minimum	%	50	Proprietary Test
Flame propagation characteristics (fire retardant grade):			AS2122.1
- median flame duration; maximum	sec.	2.0	
- eighth value; maximum	sec.	3.0	
- median volume retained	%	18	
- eighth value; minimum	%	15	

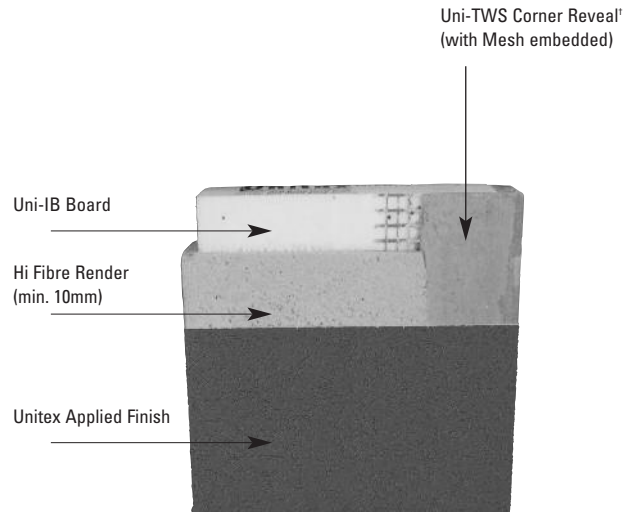
All edges of the Uni-IB Board shall be straight and true and all corners shall be at 90° angle.

Mechanical Fixers and Collars

The Uni-IB Board is mechanically fixed to the timber frame (where such construction is used) in order to hold it securely in place before, during and after the application of the reveals, base render, etc.

The fixers must be of sufficient length to ensure that they firmly hold the Uni-IB Board in place at all times. They must be of sufficient strength to allow for the weight of the other components of the Uni-TWS®. They must have a 'collar' to prevent the foam sheet from 'pulling off' under load, such as in high winds.

The fixers shall be 10 x (length) Bugle C/R Needle Point, Class 3 hardened zinc-tin plated steel screws, or equivalent, complying with AS3566-2002. The fixers need to be 25mm longer than the thickness of the



Uni-IB Board being used. Thus for a 75mm thick foam base, the fixers will need to be at least 100mm long.

The collar shall be made from polypropylene, of circular shape, with a reinforced rim, and be of dimensions: outside diameter = 50mm, internal centre hole diameter = 4.6mm (approx), centre thickness = 3.3mm minimum and thickness adjacent to the rim = 1.3mm minimum.

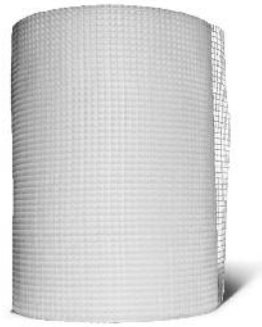
Alternative thicknesses are acceptable so long as they have a proven strength at least equal to the collar described.

Where the Uni-TWS® is being fixed to a masonry substrate, Unitex® Easy-Drive Anchors are used in place of the hardened steel screws. These anchors are a 6.5mm diameter, nail-driven nylon anchor with a countersunk head. The length is to be 25mm greater than the thickness of the Uni-IB Board being used.

* Patent protected

Uni-Mesh IM 250

The Uni-Mesh IM 250 is used to reinforce the Uni-IB Board (board-to-board) joins. It must have sufficient chemical resistance to cement-based renders. It must be of sufficient strength to withstand the shear force when render is trowel-applied on top of it.



The mesh shall be made from alkali (e-glass) or other synthetic fabric with equivalent or better performance parameters. The mesh size shall be approximately 5mm². It shall have a minimum treated fabric weight of 160 g/m². The width shall be at least 250mm so that, when applied across a join in the Uni-IB Boards, at least 120mm of mesh will be present on each side of the join.

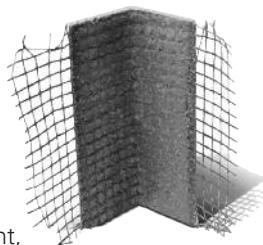
Unitex® Polymer Render

This water-based polymer render is used to 'patch' over the Uni-Mesh IM 250 to bond it firmly to the Uni-IB Board and hold the mesh in place before application of the Unitex® HiFibre Render (as the base render). Prior to trowel application, the Polymer Render is drill-mixed in the pail with 5-10% powder cement.



Corner Reveals[†] Flexible Reveals[†] Edge Reveals[†]

These reveals serve two (and sometimes three) purposes. Firstly they provide a strong, neat and straight, reinforced moulding around openings such as windows and doors. They can also be used on building corners to give added strength, trueness and impact resistance.



Secondly they set the minimum depth for application of the base render. By using adjacent reveals as float guides, a minimum depth of render of 10mm is achieved. Thus the integral strength of Uni-TWS® by the render depth is a minimum of 10mm.



A third advantage is that the Window Edge Reveal[†] is used to provide a channel for the Uni-IB Board to slot in. In this application, the Window Edge Reveal[†] protects the Uni-IB Board



bottom edge from being exposed to damage. It also acts as a level to set the bottom of the foam board straight and true.

The reveals are available only from Unitex® Granular Marble. They combine an air-cured, lightweight, fibre-reinforced, polymer-modified cement render with an embedded AR synthetic mesh (described above). The mesh is fully enclosed by the render except for a protruding width of approximately 40mm minimum on either both sides, or just one side in the case of the Edge Reveal[†].

Unitex® Sill Reveals[†]

These reveals are designed to fit the bottom structure of window openings. They are similar to the Edge and Corner Reveals[†] but have a top sloping edge (with a fall greater than 5 degrees) to allow water run-off away from the opening and wall structure.



Fixings

Fixing of the various Reveals is achieved by the use of the Bugle steel screws (described on page 2).

An alternative fixer for the Window Reveals is the purpose-designed Unitex® Window Reveal Bracket. It provides a larger surface area on which to carry the reveal. This is important if the substrate (e.g. timber frame) around the window is particularly uneven.

These brackets are a 'squared S-shape' design made from galvanised steel, 2mm thick. The length is designed to suit the Uni-IB Board being used. The end sections are 38mm squared.

Expansion Joint Mastic (Uni-Shape® Sealant)

The purpose of this material is to provide a flexible, waterproof seal at expansion and control joints, in the Uni-TWS® wall surface.



As per industry practice, where required at voids, use backer rods behind the Uni-Shape® Sealant (refer drawings).

Unitex® Expansion Joint Profiles (Optional enhancement)

These profiles are lightweight, fibre-reinforced cement-based profiles designed to sit over the expansion joints to cover any cracking that may occur with ground or substrate movement after construction. They are fixed to one side only of the joint and thus are able to 'float' with any post-construction movement.

Unitex® HiFibre Render

It is a dry-powder, lightweight cement-based render.

It is formulated with short-length synthetic fibres which, on application, cross-link to provide a reinforced render over the Uni-IB Board.



It has high impact resistance (when fully cured, 45 joule with no damage under soft-body impact testing) and long-term durability. The bond strength is at least 1,050 kPa. Water vapour permeability average is 3.5 gsm per day.

The depth of render applied shall be a minimum of 10mm. This minimum depth is ensured with the use of the reveals system (see page 4).

Unitex® Décor Range

The topcoat is from the Unitex® Applied Finishes portfolio of surface finishing coats. The range comprises fully pigmented, heavy-duty textured coatings based on fine mineral components bound by an acrylic co-polymer. They also provide strong adhesion to the base-render underneath.



The products are water-based and incorporate microbicides in the formulations to provide resistance to bacteria and fungal attack. The coatings have been tested – and

performed exceptionally well - for fire resistance under AS/NZ1530.3-1999.

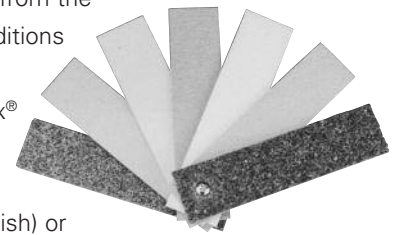
Unitex® 855, 804, 807 or 809

An alternative to the ready-to-use, wet product (from the Uni-Trowel Décor range) is the dry, powder-based topcoats. These are synthetic mineral/polymer products blended with granular marble and adhesion promoters.



Uniflex Membrane or Uni-PTC

In aggressive and/or coastal environments the textured coating is to be protected from the severe environmental conditions by a final coat, (over the Uni-Trowel Décor or Unitex® 855, 804, 807, 809 textured finish), of Uniflex Membrane (satin-effect finish) or Uni-PTC (flat-effect finish).



Dry samples of the Unitex® finish/top coats are available from Unitex®. The colour range is practically limitless. Unitex® can colour match to supplied colour swatches, dry samples of previous coatings, or even wet samples in the pail.



MANUFACTURING DETAILS

Uni-TWS® (Unitex® Thermal Wall System) is supplied solely by Unitex® Granular Marble Pty Ltd or its licensees. The individual components are manufactured by:

Component	Manufacturer
Uni-IB Board	Foamex Manufacturing Pty Ltd
Mechanical Fixers	Tri-Fixx Pty Ltd
Collars (for mechanical fixers)	Unitex® Granular Marble Pty Ltd
Unitex® Window Reveal Brackets	Tri-Fixx Pty Ltd
Uni-Mesh IM 250	Saint-Gobain Technical Fabrics
Unitex® Polymer Render	Unitex® Granular Marble Pty Ltd
Unitex® Edge Reveals†	Unitex® Granular Marble Pty Ltd
Unitex® Corner Reveals†	Unitex® Granular Marble Pty Ltd
Unitex® Flexible Reveals† (levelling strip)	Unitex® Granular Marble Pty Ltd
Unitex® Sill Reveals†	Unitex® Granular Marble Pty Ltd
Expansion Joint Mastic (Uni-Shape® Sealant)	Tremco Pty limited
Unitex® HiFibre Render	Unitex® Granular Marble Pty Ltd
Uni-Trowel Décor range	Unitex® Granular Marble Pty Ltd
Uniflex Membrane	Unitex® Granular Marble Pty Ltd
Uni-PTC	Unitex® Granular Marble Pty Ltd
Unitex® 855, 804, 807, 809	Unitex® Granular Marble Pty Ltd

Please note that the listed suppliers may be added to or replaced by others without prior notice, so long as the component produced meets the specifications required.

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FIXING DETAILS

TIMBER FRAME

The timber frame must be constructed according to Australian Standard AS1684. Typical framing timbers used are of 90 x 35mm cross-section dimensions. For Uni-TWS® application the maximum stud spacing centre-to-centre shall be 450mm.

With this stud spacing, the maximum fastener spacing (using the specified fixers), on each and every stud, is given in the following table.

Wind Classification (AS 4055)	Within 1200mm of building edge (in mm)	Elsewhere (in mm)
N1	600	600
N2	550	600
N3	350	600
N4	200	400
N5	150	250
N6	NS*	200

*NS = Not Suitable

These spacings have been determined through tests carried out by the CSIRO Building, Construction and Engineering (now Manufacturing and Infrastructure Technology) and are given in Report 02/214, July 2002.

Whilst these spacings are calculated from the results of the tests conducted by the CSIRO, Unitex® has determined that – even where the results indicate that greater distances are satisfactory - **the maximum spacing distance for fixers shall be 450mm.**

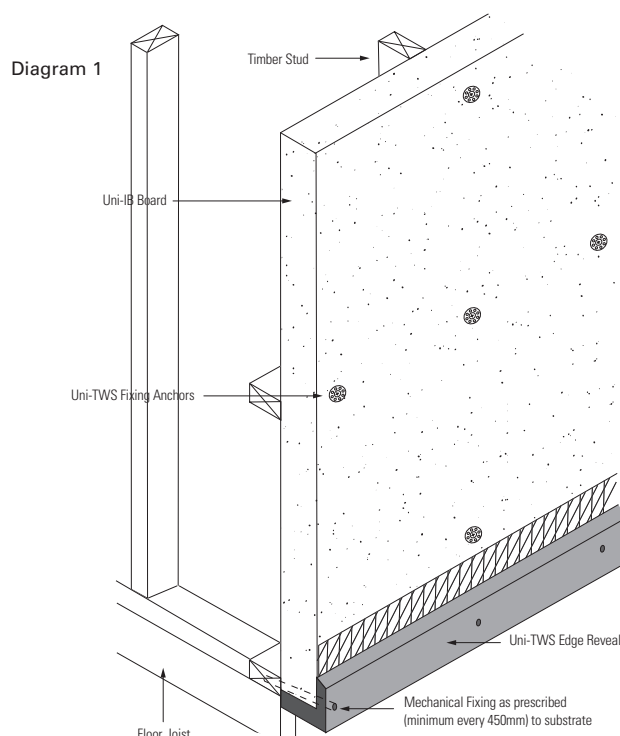
Starting Out*

Check wall frames and if necessary straighten before installing the foam base sheet (Uni-IB Board). Sheets must be clean, (free of any dirt, dust, or other surface contaminants) and dry prior to coating. Uni-IB Board must not be left in the sun uncoated for more than four weeks. The starting point for fixing Uni-IB Board is the bottom edge of a building corner. The first sheet, orientated horizontally, should be fitted in line with the edge and at a height set by the building specifications.

One way of getting a true fix is to use the Uni-TWS® Window Edge profile as both a level setting and an edge protection system. This can be used to fix a level and horizontal 'channel' at the appropriate height into which the foam sheet can be slotted in. This edge will also protect the bottom of the foam sheet during and after construction.

The Window Edge is mechanically fixed, (with Bugle C/R Needle Point, Class 3 hardened zinc-tin plated steel screws, or equivalent, complying with AS3566-2002), with a maximum fixing separation distance of 450mm. The screw fixer is drilled through the thicker section of the Window Edge, through the Uni-IB Board and into the timber frame to a depth of at least 25mm. Refer Diagram 1 and the Appendix Drawings.

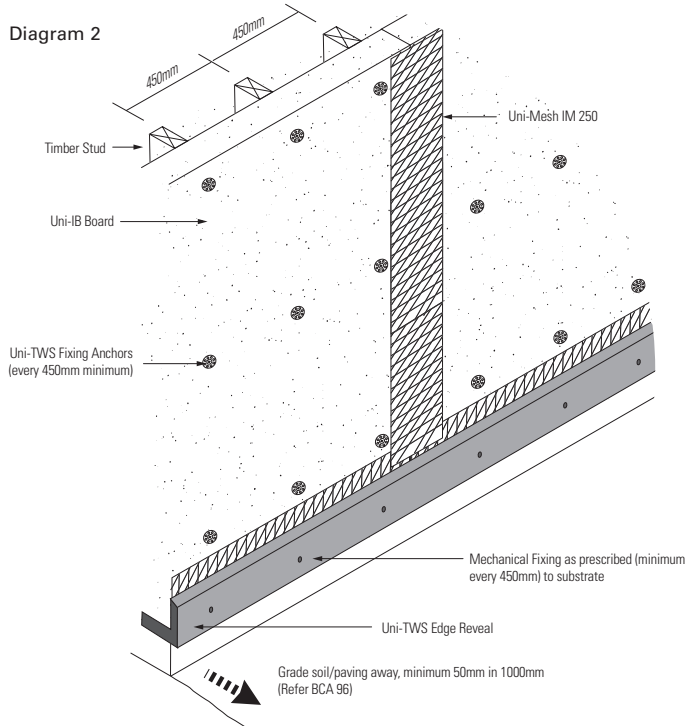
*Note: If sisalation is desired to be installed then it must be of a 'breathable' type to ensure moisture vapour does not condense behind the Uni-IB Board. The sisalation is to be installed before Uni-TWS®.



If the Window Edge profile, (acting as the bottom sheet level and edge protector), is not used then the foam itself must be set true and level at the corner of the building. No return edge of a sheet (Uni-IB Board) should be left unprotected or left exposed to the weather, ie the Edge Reveal must be used to the underside of the Uni-IB Board. In all cases the Uni-IB Board must not be left exposed to the weather.

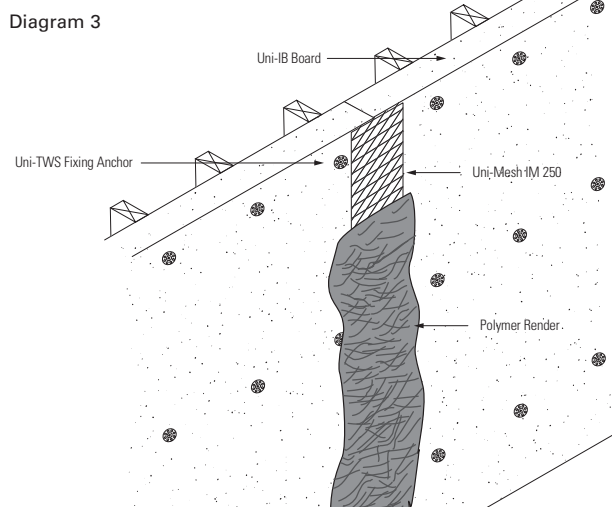
Once the first sheet is fixed in place, again with a maximum separation distance between fixers of 450mm, subsequent sheets are fixed maintaining the level. Sheets (generally 1.2m x 2.4m) are to be orientated horizontally in a brickwork pattern. Individual sheets are butted up against each other so that no gap is present between sheets. The sheets should also be fitted so that the surfaces of adjoining sheets are flush. **Even smaller cut sheets must be fixed to at least two studs.** Refer Diagram 2 and the Appendix drawings.

Whichever method is used to set and fix the foam sheets, the bottom of the sheets must not be allowed to come into contact with soil. (Builders are responsible for correct placement of damp courses, waterproofing, flashing etc). Acrylic coatings are not designed to survive in a continually wet and damp environment. Ground level should be sloped to fall away from the wall to council regulations. Refer Diagram 2 and the Appendix drawings.



Joining the Sheets

At the sheet joins, 250mm wide Uni-Mesh IM 250 is laid over the join so that at least 120mm of mesh extends each side of the join. The mesh must be laid over the full length of the join. This is similar to the technique of 'stopping' used on internal plaster-sheet joins. Refer Diagram 3 and the Appendix drawings.



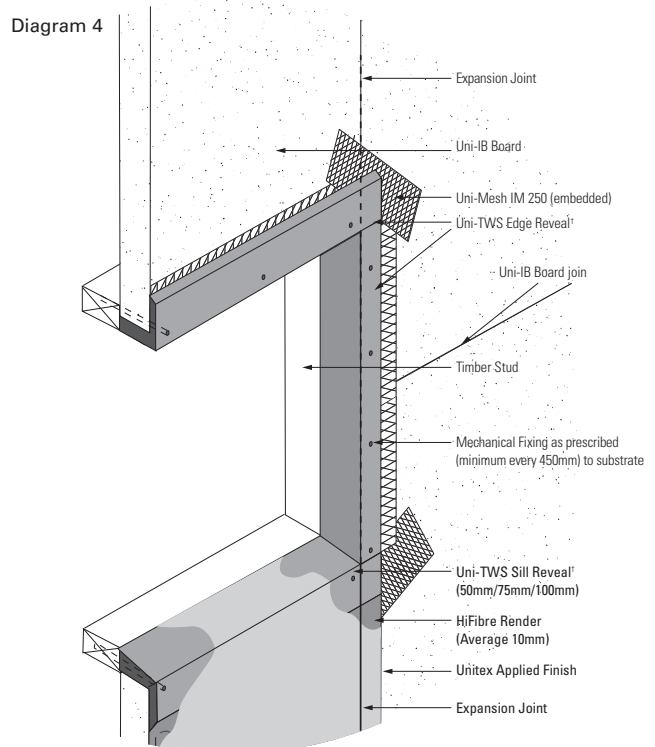
This mesh, whilst being held in place, is then coated with an adhesive render coat, Unitex® Polymer Render. On site this render is cement modified by adding 5-10% cement powder. Some additional water may be required. The amount of

cement to be added depends on the prevailing weather conditions. The cement powder and water (if required) are added and drill mixed immediately prior to application.

This render coating over the mesh must cover the full width of the mesh to a depth of approximately 2mm. This render is designed to provide very strong adhesion to the foam substrate. The Unitex® Polymer Render must be allowed to dry – recommended minimum 24 hour period or until hard through dry – before the fibre-reinforced Unitex® HiFibre Render is applied.

Fitting Around Openings

Windows, doors, etc. are readily accommodated with Uni-TWS®. The edges are sealed and protected with Uni-TWS® Edge Reveals† and Uni-TWS® Sill Reveals†. These are mechanically fixed using the same fixers as for the Uni-IB Board. The maximum separation distance for the fixers is 450mm. Our Window Sill Reveal profiles have an approximate 10 degree fall to allow water to run away from the window and wall. Waterproofing around windows and other openings is the prerogative of the window/door manufacturer. So, in addition to our drawings (see Appendix), you should always refer to the manufacturer's recommendations. Refer Diagram 4 and the Appendix drawings.



As an alternative to the Bugle screws, for Uni-TWS Window Edge Reveals† only, the Unitex® Window Reveal Bracket can be used. This is designed for situations where the substrate (e.g. timber frame around the window opening) is particularly uneven.

In all circumstances, up to 2.4m in length, full lengths of Uni-Shape® Mouldings are to be used.

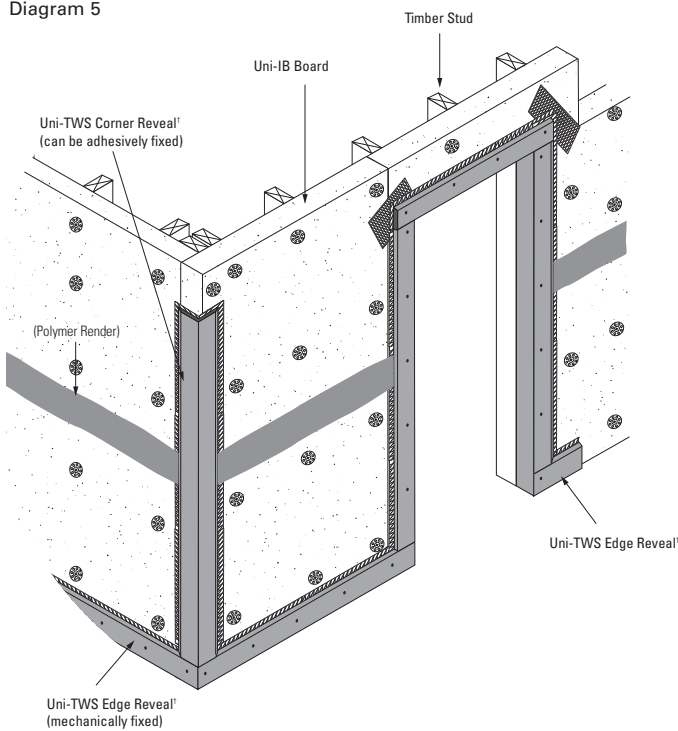
† Patent protected

The reveals should be cut to size on-site, to suit measurements of the actual building not measurements off the plans. They can be treated as per timber using the same tools for sawing, pre-drilling etc. Once fixed, the reveals are strong and stable. Extra care must be used in handling them to ensure that cracking and/or breaking does not occur before fixing is completed. Where horizontal and vertical reveals intersect, fitting Uni-Mesh IM 250 (250mm) cut to length, behind the reveals, reinforces the joint. Refer Diagram 4 and the Appendix drawings.

Fitting at External Corners

Here the corner is protected, and the correct depth for the base coat is set, by the use of Unitex® Corner Reveals†. These are cut to the correct length. Then a wet mix of the Unitex® HiFibre Render is applied onto the Uni-IB Board at the corner. The Corner Reveal† is then firmly pushed into place and set with a plumb line to level, and held to ensure a strong adhesion is achieved. Refer Diagram 5 and the Appendix drawings.

Diagram 5



Sealant Application

Construction/expansion joints (refer Appendix drawings) are to be sealed with Unitex® Sealant. This is a waterborne polycarbonate sealant with good adhesion to this type of surface and with the required expansion properties. The size of the joint should be at least 4 times the anticipated movement. The sealant width should never be less than the sealant depth and, ideally, should be twice the depth. Always hot knife cut the Uni-IB Board to approximately 70% its depth through the control joint in the render before the mastic sealant is applied.

† Patent protected

Before applying the sealant, the surfaces should be clean and dry. Do not apply the sealant if rain is expected within 4 hours. The sealant application temperature range is 5-40°C. Ensure rain cannot penetrate behind the sealant until full through-cure, minimum 48 hours (at standard temperature and humidity), has been achieved.

Joins in Reveals

As indicated previously, full lengths of Uni-TWS reveals are to be used. However where any side of an opening exceeds the full length reveal (2.4m), then the procedure for joining two lengths of reveals is:

- i) Break-away approximately 10-15mm of the reveal from each end to be joined. The reinforcing mesh thus exposed is left in place.
- ii) Overlap the two ends of the reinforcing mesh by 15-20mm.
- iii) Fix the reveals either mechanically or adhesively.
- iv) Render over the gap with Unitex HiFibre Render. Refer Diagrams 6A and 6B and the Appendix drawings.

Diagram 6A

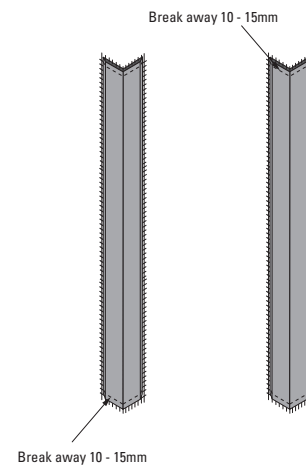
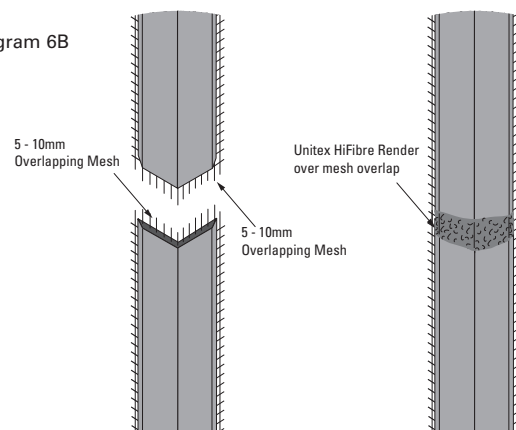


Diagram 6B



Applying the Base-Coat

Before applying the Base-Coat, Uni-IB Board must be clean, (free of any dirt, dust, or other surface contaminants) and dry prior to coating. The base coat to use is Unitex® HiFibre Render. A critical component of the Uni-TWS® is this

fibre-reinforced render base-coat. It is applied to a thickness of 10mm (often requiring two passes). This 10mm thick HiFibre Render significantly contributes to the strength of the total system.

To ensure that the 10mm thickness is maintained over the whole surface of the system it is essential that thickness 'guides' be used. This is achieved by use of the Unitex® Corner Edge, Render Levelling Strip and Window Edge and Sill Reveals†. When these are fixed into place, the render can be applied and a straight edge run over the surface. The surface is then trowelled smooth. This will ensure a uniform 10mm thick render base-coat is achieved prior to trowelling to the required smoothness for top coats. Refer to Diagrams 7A and 7B and the Appendix drawings.

As per quality tradesmanship practice, the HiFibre Render, (and all subsequent coats), is to be applied to a full wall with no cold joints. That is the coating is to be applied corner-to-corner, join-to-join before stopping for a break.

Diagram 7A

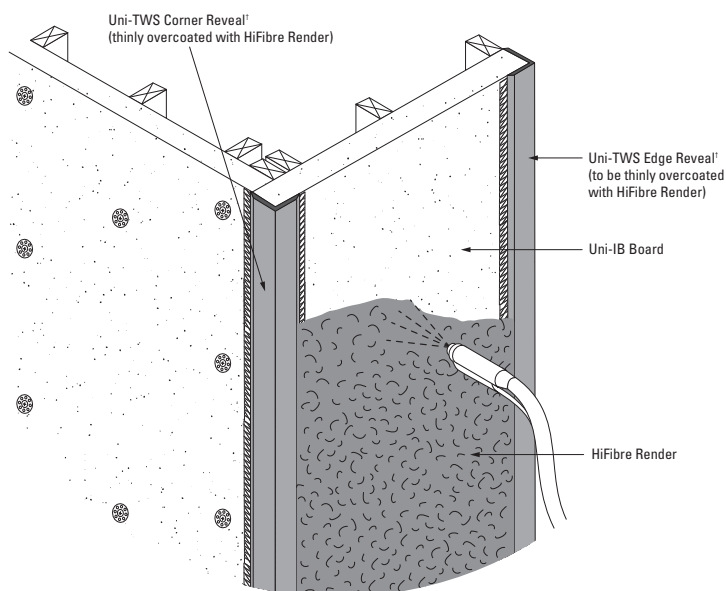
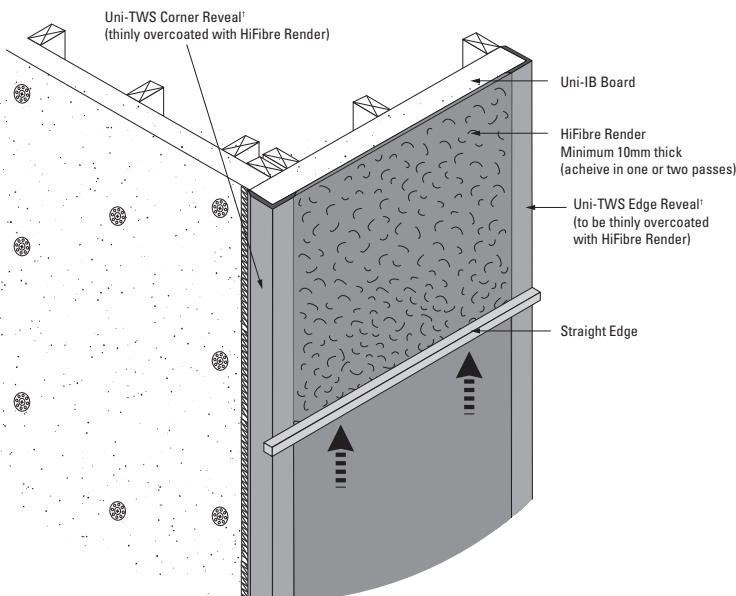


Diagram 7B



The Unitex® HiFibre Render can be either spray or trowel applied. If spray applied, the render must be mixed with clean water on site – in the spray-machine's mixing chamber - immediately before application to the surface. Similarly if trowel applied, the clean water must be added immediately before trowelling onto the surface. The amount of clean water to be added is the minimum needed to give the required combined slump, surface grab and trowelability performance (flowing, thick, honey-like).

The HiFibre Render is also thinly coated over the reveals to provide wet-edge continuity.

The Unitex® HiFibre Render base-coat must be allowed to dry for a minimum of 72 hours before required expansion/control joints are prepared prior to the topcoat application.

Note: Expansion and control joints must be installed before applying the top coat (surface applied finish).

Applying the Top-Coat (surface applied finish)

Before applying the topcoat, the surface of the base render must be inspected for any substrate movement indicated by cracking, especially at window and door edges. Where cracking is evident then a control joint should be made before the topcoat is applied. Apply the top coat only after the main internal carpentry is completed. Refer to the Appendix drawings for details.

The topcoat is chosen from the wet, ready-to-use Unitex® Décor range of products or the dry powder-based finishes such as Unitex® 855, 804, 807 or 809.

The water-based products include Uni-Roll Décor, Uni-Trowel Décor and Uni-Marble Grain. They are textured coatings designed for durability and flexibility. They are based around an acrylic co-polymer that promotes adhesion and provides a relatively high impact-resistant surface. There is a wide choice of surface finishes and the colour range is virtually limitless. Refer to your local Unitex® office/distributor for the appropriate brochures that provide all the details needed.

The powder-based Unitex® dry powder (green bag) polymeric products are blended with fine granular marble and additives to give a dry product with strong adhesion and long-lasting performance. They are simply mixed with the appropriate amount of clean water on site. The amount of water is typically 4-5 litres per bag of Unitex® dry powder. The correct amount needed depends on the prevailing weather conditions.

Whether using the water-based Unitex® Décor range or the dry powder Unitex® range, the textured coating can be applied directly over the Unitex® HiFibre Render, 72 hours (at standard temperature and humidity conditions) after this base render has been applied. In wet, cold (winter)

† Patent protected

conditions the time for complete through-dry may be as long as 10 days.

Before applying the finish coat, make sure the underlying surface is clean, smooth and dry without any bumps or other imperfections. To remove any imperfections, rasp off the bumps, dags, etc. This process not only will provide the best key for the topcoat but also will enhance the visual impact of the finished coating.

The surfaces must be free of grease, oils, dust, dirt, efflorescence etc. and dry before applying the finish coat. If necessary brush and/or scrub the surface of the base-render coat to ensure it is clean before applying the finish coat.

These finishes are either trowel or roller applied. The Uni-Décor product can be applied directly from the container in which it is supplied. Whether trowelling or rolling on, the application should be in long, smooth sweeps. Always roll or trowel to the edge and not away from it. The product should not be applied if the ambient temperature is below 10°C or above 35°C. It should not be applied if the surface is wet or the ambient condition is hot and windy/cold and misty.

Applying the Protective Membrane

In aggressive environments, such as coastal locations, the Unitex® Décor range or the Unitex® dry powder finish product must be over coated with a water-based, highly flexible, membrane coating. This protective coating will reduce the UV and dirt pick-up effects to the pigmented texture coating.

The product to be used is either Uni-PTC or Uniflex Membrane. Both do the same protective job. The Uni-PTC is used if a matt surface effect is desired whilst the Uniflex Membrane is used if a satin surface effect is required.

The protective membrane coating is applied at a minimum time of 72 hours after the Unitex® Décor product or Unitex® dry powder finish has been applied. Again the surface must be clean, dry and free of efflorescence before the Uni-PTC or Uniflex Membrane is applied. Application is by roller for broad-wall. A brush is more suitable for application over mouldings.

STEEL FRAME

The application procedure for fixing Uni-TWS® to steel frames is the same as for timber frames, except where the steel used is of a heavy gauge, as specified by the engineer.

In these cases the steel may need to be pre-drilled so that the holes formed, line up with the position of the correct fixing screws through the Uni-IB Board. The application process for the rest of the Uni-TWS® system is to be followed as described under the previous heading

TIMBER FRAME, except that specified screws must be used for the heavy gauge.

CEMENT SHEETING

The sheeting used must comply with the relevant standard, currently AS/NZS 2908.2 for flat sheet products. The fixing of the sheets must comply with the manufacturer's specifications.

The application of Uni-TWS® to the sheeting is the same procedure as described under the previous heading *TIMBER FRAME* being mindful of course that the fixing is, through the sheeting, into the frame.

MASONRY

The fixing of Uni-TWS® to a brick, cement block, etc. wall is a very similar procedure as that for *TIMBER FRAME*. The maximum separation distance between fixers is 450mm in a horizontal direction. The vertical separation distance is determined from the chart shown on page 6, so long as it does not exceed 450mm.

If fixing to masonry substrates the fixers to be used are Unitex® Easy-Drive Anchors. Otherwise the procedure, is as described under the heading for *TIMBER FRAME*.

REPAIR PROCEDURES

Whilst Uni-TWS® has a strong impact resistance it is, like any other structure, subject to damage if impacted by a hard object with sufficient force. One advantage of Uni-TWS® over other wall systems (e.g. brick veneer), is that if the impact is relatively severe (such as a car 'nudging' the wall), the damage is typically confined to a more localised area. This will make repairs easier, less time consuming and less expensive.

The following details give the procedure to be followed to repair the damage and restore the strength and appearance of the Uni-TWS®.

SUPERFICIAL DAMAGE

This section covers dents and surface cracking.

Dents: The damaged area should be cut out (around the impact zone) to a flat surface, in all directions. The cut out should be back to the outer surface of the Uni-IB Board. The hole formed should then be filled with the Unitex® HiFibre Render to the same depth as the surrounding base render. Use a float to level off if there is sufficient room to do so. Allow 72 hours to dry.

Then finish with the same topcoat (from the Unitex® Décor range or Unitex® dry powder range) as originally applied. The topcoat should be applied over the full panel (or from corner to control joint etc.) effected. This will minimise any difference in appearance over time with the repaired panel and the rest of the wall.

Cracking: If the crack is wide or penetrates well below the surface, then the first step is to open out the crack into a channel, extending either side of the original crack. This channel should be wide enough to allow application of repair material as above. The depth of the channel should expose the outer surface of the Uni-IB Board.

From then on, the same procedure as for the repair of dents is followed.

If the crack is very fine (e.g. hairline cracking) then the surface should be scratched away either side of the crack to provide a key for the topcoat. The surface should then be clean and dry with any loose material brushed away. The crack is then coated with the same topcoat (colour-matched as indicated above) applied by a trowel.

Of course, if the extent of cracking is quite significant (especially emanating from window, door edges, etc.) then it may indicate insufficient or inadequate expansion or structural control joints in the wall. This problem will need to be solved (install a control joint) before crack repairs are carried out. If it is not done, then the cracking will re-appear. Refer to the Appendix drawings for application details to joints. Also refer to the builder/engineer/specifier for the best solution to the control/expansion joint problem.

SUBSTANTIAL DAMAGE

In this context, 'substantial damage' means the result of an impact whereby the Uni-IB Board, (naturally of course along with the rest of the system), has been damaged. In some cases the frame (or other substrate) may also be damaged. Of course, the appropriate repairs to the frame, etc. must be completed before the Uni-TWS® can be repaired.

The first step is to cut out the Uni-IB Board (back to the studs where applicable). Cut out a section of Uni-IB Board to fit the hole formed and butt it up against the existing Uni-IB Board sheets. Fix this section as per the (new) application procedure (on page 6 and following).

If there is damage to the reveals such as a Corner Reveal† there is no need to remove the whole reveal piece. The reveals are designed, like the rest of the Uni-TWS®, to absorb the energy and thus the area of damage is limited.

This is in contrast to a non-shock absorbing reveal (such as a steel corner piece) where the impact is transferred to the broad wall. Here cracking along the broad-wall/edge piece is the likely outcome.

In the Uni-TWS® the reveal is repaired by trowel application of the Unitex® HiFibre Render to fill the damaged section. Then allow minimum 72 hours or until through-dry before trowel-application of the matching topcoat over the entire surface of the effected panel(s).

† Patent protected

CONSTRUCTION DRAWINGS

TABLE OF CONTENTS

Description	Page No.
Starting Out: Drawings 1 - 10	12 - 14
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Around Window: Drawings 21 - 29	15 - 17
Wall Attachments: Drawings 30 - 31	17
Control/Expansion Joints: Drawings 32 - 38	17 - 18
Roof Level/Upper Storey: Drawings 39 - 41	19
Coating: Drawing 42	19

For clarity not all construction details shown (eg for concrete slab, brick footings etc). Refer to BCA and appropriate standards for relevant details.

Window and door head, architrave sills to be flashed and waterproofed as per manufacturers recommendations. Where this is not possible please refer to the BCA recommendations for flashing.

GLOSSARY OF TERMS

Uni-IB Board: Sheet of expanded polystyrene foam, with a standard size of 1200mm (h) x 2400mm (w). The thickness is usually 75mm. Other standard thickness are 50mm and 100mm (Refer Section 1 for more details).

Uni-TWS® Fixing Anchors: Bugle c/r Needle Point Class 3 hardened zinc-tin plated steel screws with polypropylene collars (Refer Section 1 for more details).

Polymer Render: Unitex manufactured water-based polymer render.

Uni-Mesh IM 250: Alkaline resistant fibreglass mesh approximately (5mm²) with minimum treated fabric weight of 160g/m². Width minimum of 250mm.

HiFibre Render®: Unitex manufactured dry-powder, polymer-modified fibre-reinforced base render.

HiLite Render®: Unitex manufactured dry-powder, polymer-modified base render for high build applications.

Uni-TWS® Edge Reveal[†]: Unitex manufactured lightweight, fibre-reinforced, polymer modified, cement-based solid moulding with embedded mesh, designed specifically for application to edges in Uni-TWS®.

Uni-TWS® Corner Reveal[†]: Unitex manufactured lightweight, fibre-reinforced, polymer modified, cement-based solid moulding with embedded mesh, designed specifically for application to corners in Uni-TWS®.

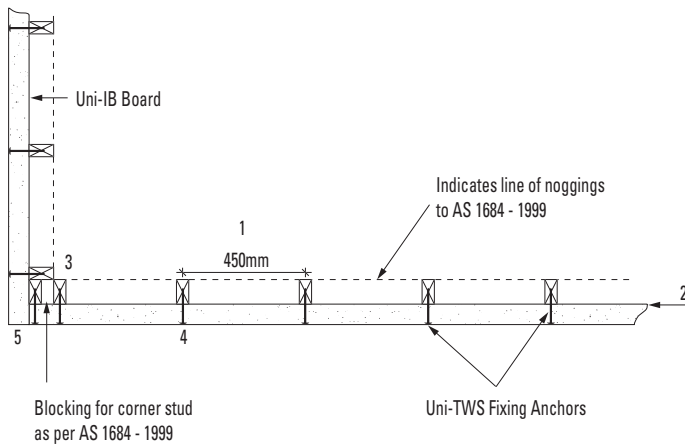
Uni-TWS® Sill Reveal[†]: Unitex manufactured lightweight, fibre-reinforced, polymer modified, cement-based solid moulding with embedded mesh, designed specifically for application to window sills in Uni-TWS®.

Uni-TWS® Flexible Universal Render Levelling Strip[†]: Unitex manufactured lightweight, fibre-reinforced, polymer modified, cement-based solid moulding with embedded mesh, designed specifically for application to broad wall expanses to ensure min. 10mm thickness of render in Uni-TWS®.

Unitex® Applied Finish: Unitex manufactured range of pigmented finish coats (Uni-Décor range or Unitex dry powder finishes), plus protective topcoats (Uni-PTC or Uniflex membrane).

Drawing 1

Uni-TWS: Framing Specifications - Plan View

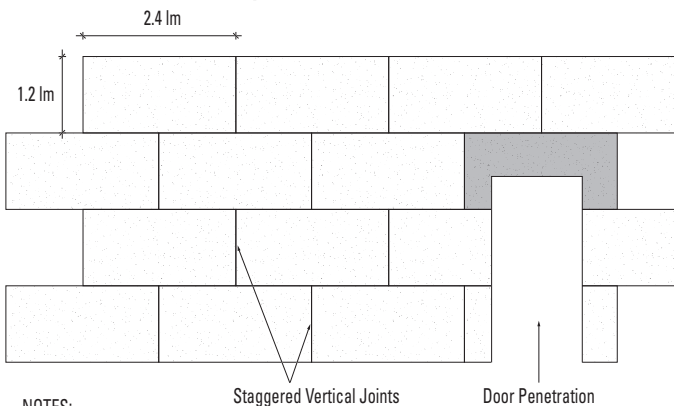


NOTES:

1. Studs at maximum 450mm centres.
2. Studs to be in line along length of wall.
3. At external corners extra stud between frames.
4. 8 x Uni-TWS Fixing Anchors per square metre.
5. Corners must be true or by fitting extra Uni-IB Board to outside corners and hot wire cutting or rasping to true.
6. Specified frame bracing is to be by the Builder.
7. If sheet bracing used (corners etc.) add packing (full length and width of studs) to non-braced studs to align wall.

Drawing 2

Uni-TWS: Uni-IB Board Layout - Elevation

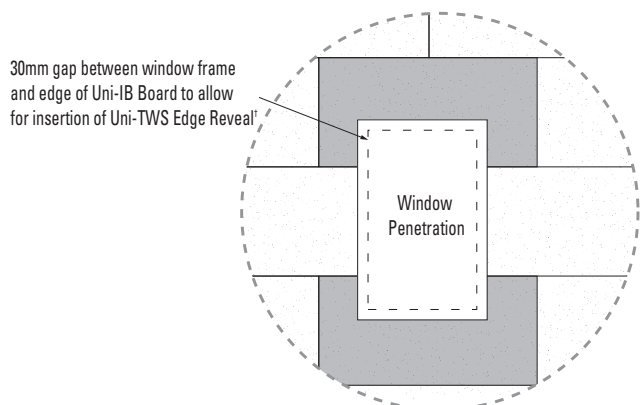


NOTES:

1. Uni-IB Board (sheets) must be oriented horizontally with staggered vertical joints.
2. Back blocking not required (join off-stud).
3. Generally sheet size 2.4 lm horizontal 1.2 lm vertical (lm = lineal metres).
4. Window, or door head Uni-IB Board to be cut as shown (shaded area).

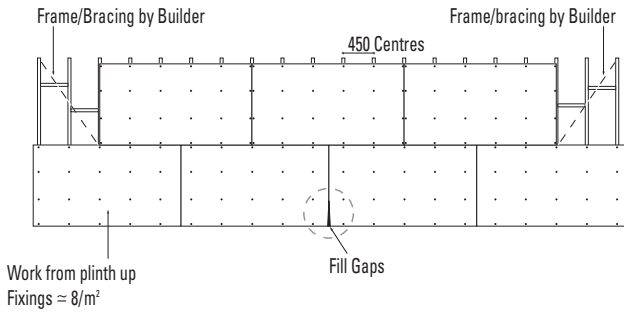
Drawing 3

Uni-TWS: Uni-IB Board cutting around penetrations - Elevation



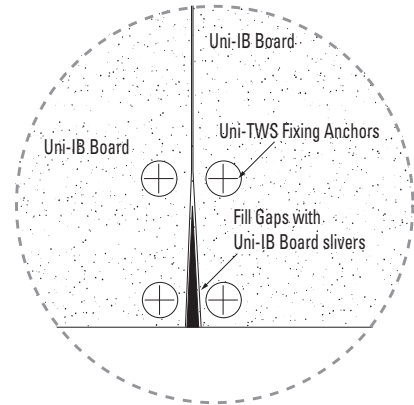
[†] Patent protected

Drawing 4
Uni-TWS: Uni-IB Board Fixing to frame - Side Elevation



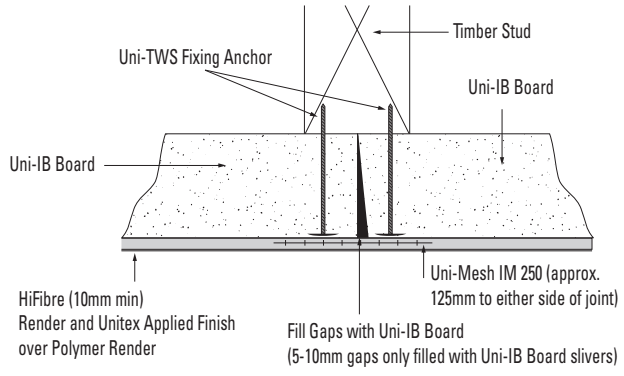
- NOTES:
1. Uni-IB Boards to be fixed horizontally with staggered joints
 2. Do not fix sheets vertically

Drawing 5
Uni-TWS: Filling of gaps between Uni-IB Board - Detail



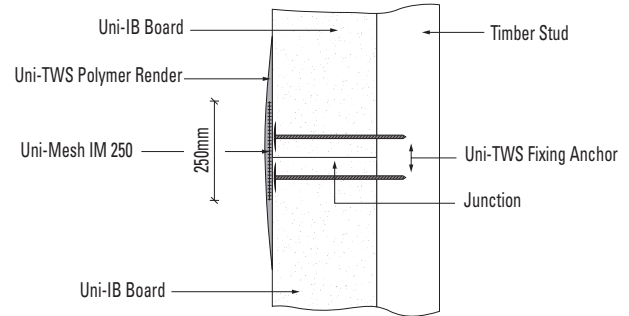
NOTE:
 Do not leave gaps between joints. If gaps occur fill with sliver cuts of Uni-IB Board and rasp smooth before overcoating with Uni-Mesh IM 250, HiFibre Render and Unitex Applied Finish.

Drawing 6
Uni-TWS: Filling of gaps between Uni-IB Boards over stud - Plan View Detail

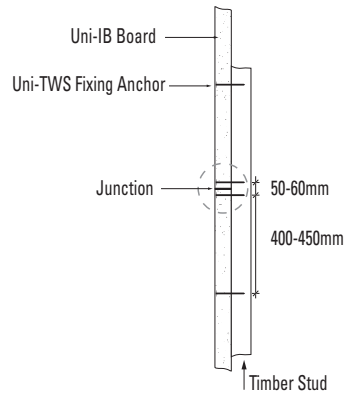


NOTE:
 Do not leave gaps between joints. If gaps occur fill with sliver cuts of Uni-IB Board and rasp smooth before overcoating with Polymer Render, Uni-Mesh IM 250, HiFibre Render and Unitex Applied Finish.

Drawing 7
Uni-TWS: Junction of Uni-IB Boards - Cross Section (i)

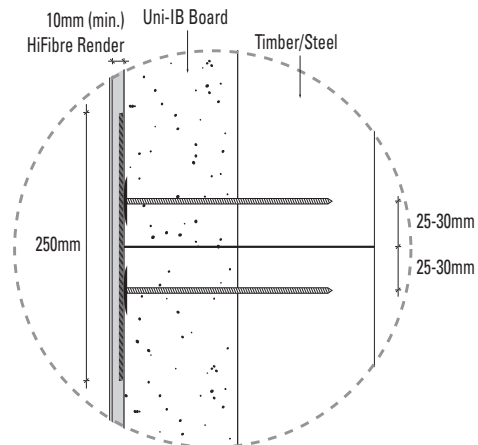


Drawing 8
Uni-TWS: Junction of IB Boards - Cross Section (ii)



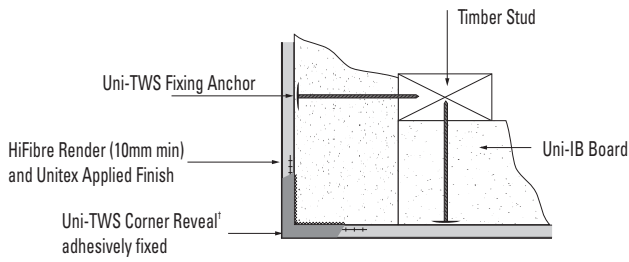
NOTE:
 1. Fixing near sheet edge is to be 25-30mm from edge

Drawing 9
Uni-TWS: Junction of IB Boards - Cross Section (ii) - Detail



NOTE:
 Uni-IM Mesh 250 embedded in Polymer Render then overcoated with HiFibre Render (10mm min.) and Unitex Applied Finish.

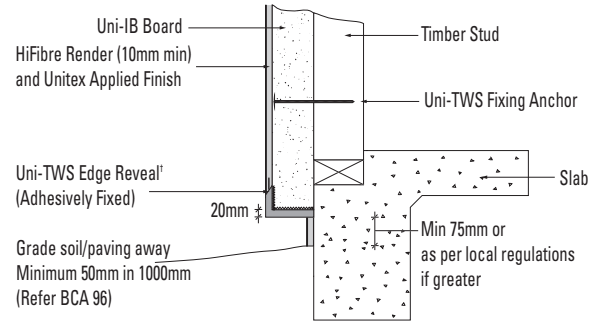
Drawing 10
Uni-TWS: Corner Reveal[†] - Plan View



NOTE:
 Adhesively fix Uni-TWS Corner Reveal with HiFibre Render (total rear surface area) when it is not possible to mechanically fix to a stud. (Can use HiFibre Render liquid backer at rear & Uni-TWS Corner Reveal to square and plumb minor defects in the surfaces).

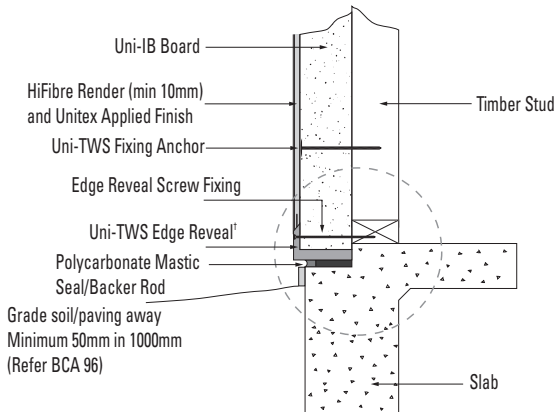
[†] Patent protected

Drawing 11
Uni-TWS: Edge Reveal[†] as Plinth Base Edge



[†] Patent protected

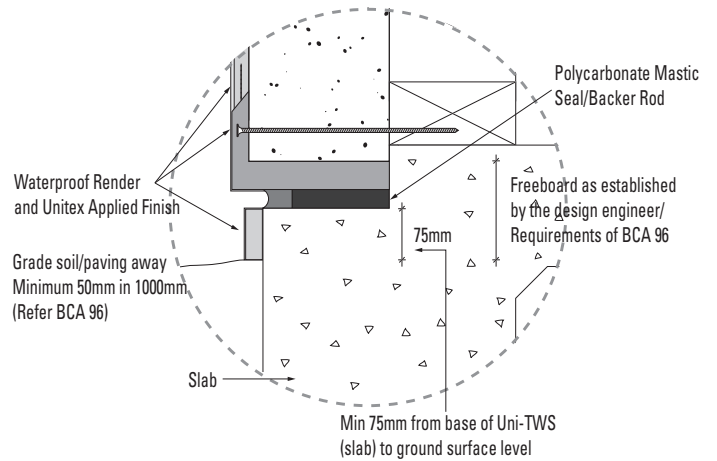
Drawing 12
Uni-TWS: Slab at Ground



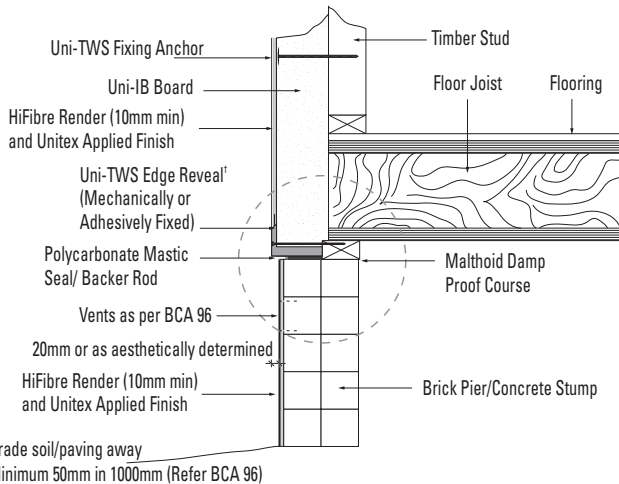
NOTE:
 Unitex Applied Finish provides a clean and durable surface.

[†] Patent protected

Drawing 13
Uni-TWS: Slab at Ground - Detail



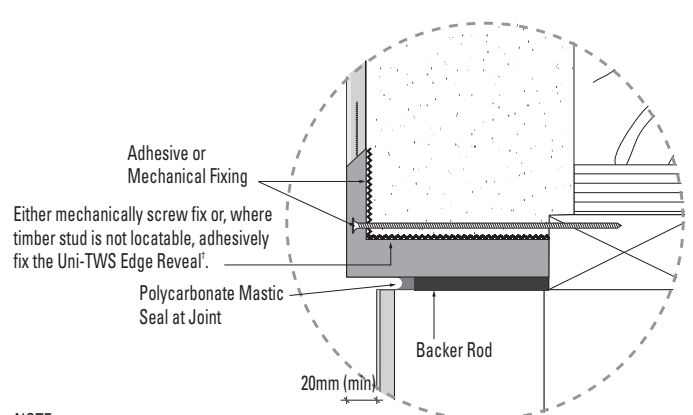
Drawing 14
Uni-TWS: Above Ground Footing Protruding Wall



NOTE:
 Ideally the upper surface protrudes 20mm past the lower surface.

[†] Patent protected

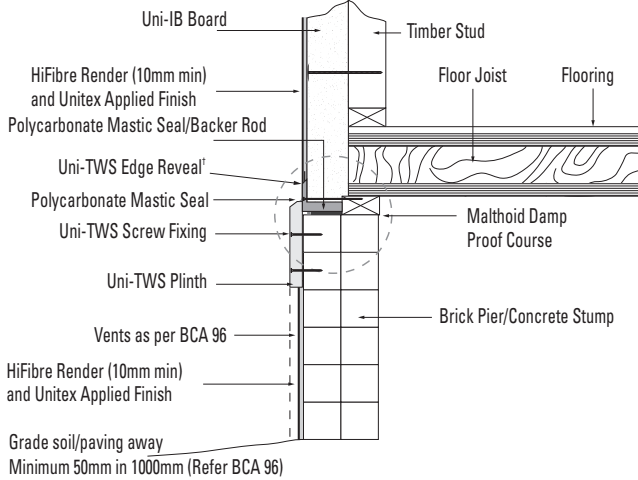
Drawing 15
Uni-TWS: Above Ground Footing Protruding Wall - Detail



NOTE:
 Uni-TWS for both protective and decorative reasons should protrude min. of 20mm proud of lower (or ground floor) wall surface.

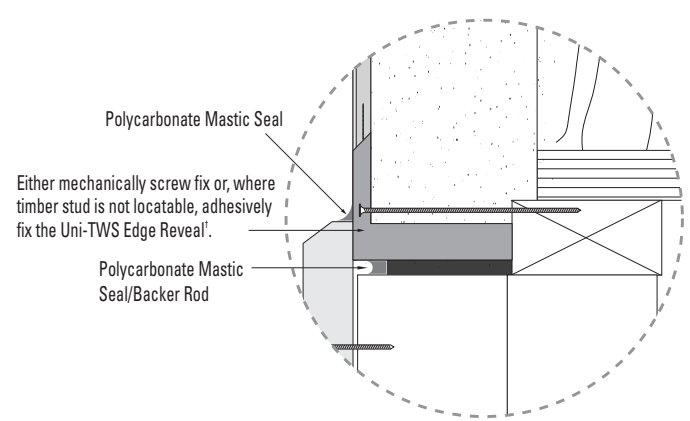
[†] Patent protected

Drawing 16
Uni-TWS: Above Ground Footing Plinth



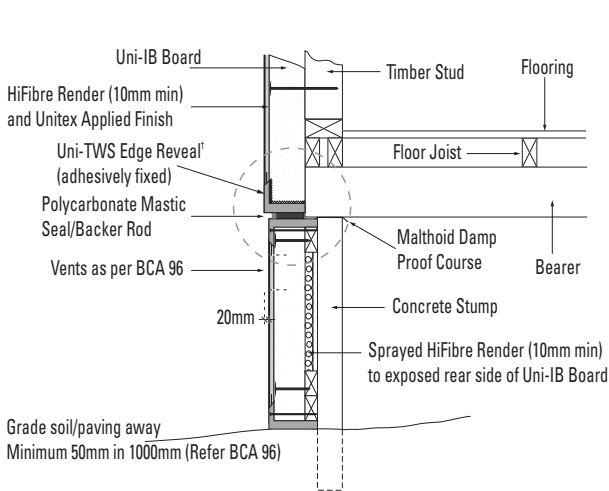
NOTE:
 For higher build coating of the Plinth, if desired, use HiLite Render. † Patent protected

Drawing 17
Uni-TWS: Above Ground Footing Plinth - Detail



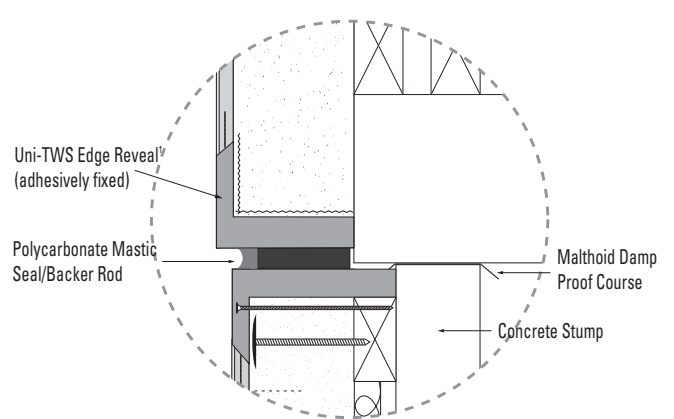
NOTE:
 Plinth is fixed only to one surface (this allows normal movement between the two substrates).

Drawing 18
Uni-TWS: Timber Framed Structure

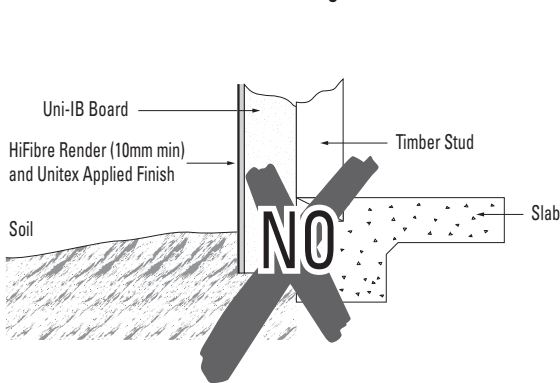


† Patent protected

Drawing 19
Uni-TWS: Timber Framed Structure - Detail

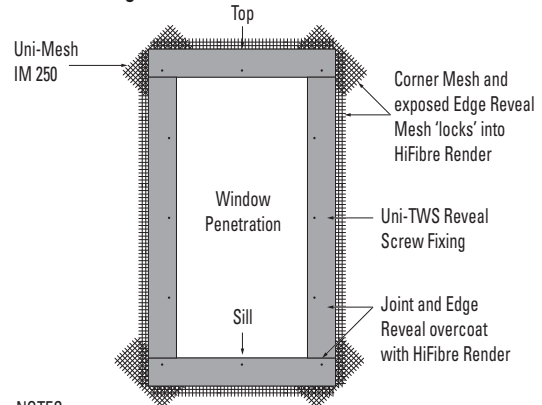


Drawing 20
Uni-TWS: Backfill - DO NOT BACKFILL against Uni-TWS



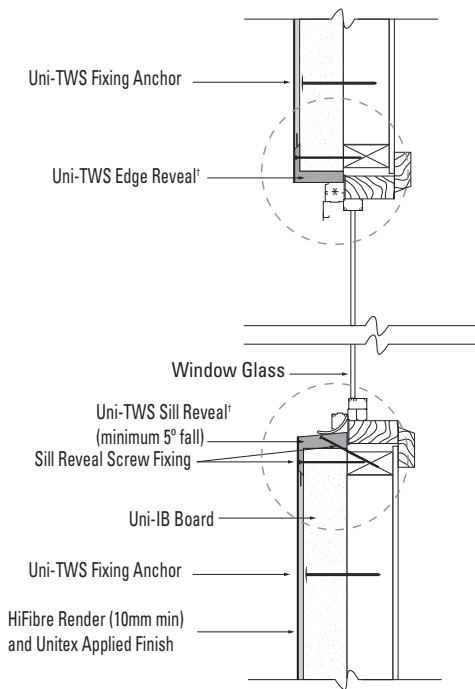
NOTES:
 1. Do not Backfill over Uni-TWS.
 2. Always allow for highly permeable and efficient drainage.
 Allow for regulation clearance above ground level- at least 75mm.

Drawing 21
Uni-TWS: Edge Reveal' Window Detail



NOTES:
 1. Complete lengths of Uni-TWS Edge Reveals are to be used on all sides- ie. no joined off-cuts are to be used to make up a length.
 2. Uni-TWS Edge Reveals are supplied in 2.4m lengths.
 3. Joins between top, sill and side lengths are to be at right angles as shown.
 † Patent protected

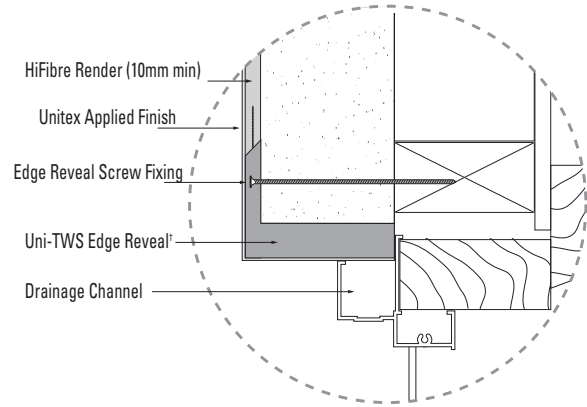
Drawing 22
Uni-TWS: Cross Section View of Window Reveals



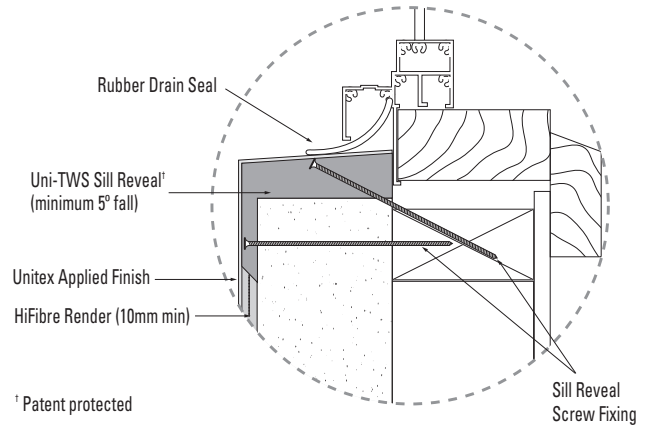
NOTE:
 Typical aluminium awning style window (eg Stegbar) with drainage channel*

† Patent protected

Drawing 23
Uni-TWS: Cross Section of Window Edge Reveal† - Detail

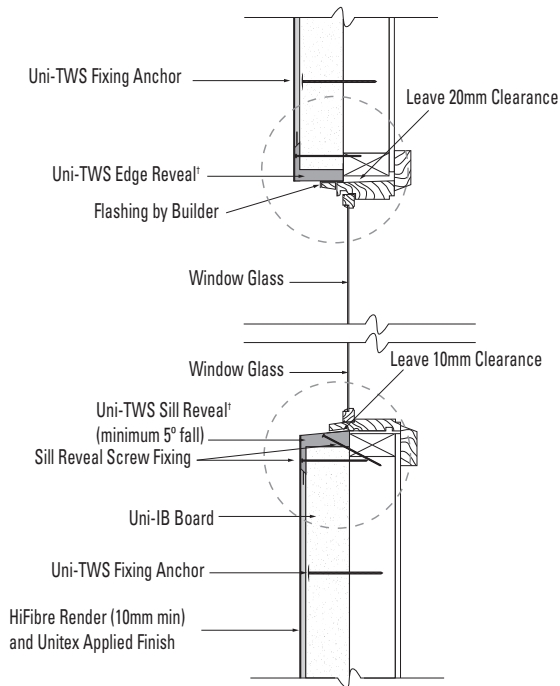


Drawing 24
Uni-TWS: Cross Section View of Window Sill Reveal† - Detail



† Patent protected

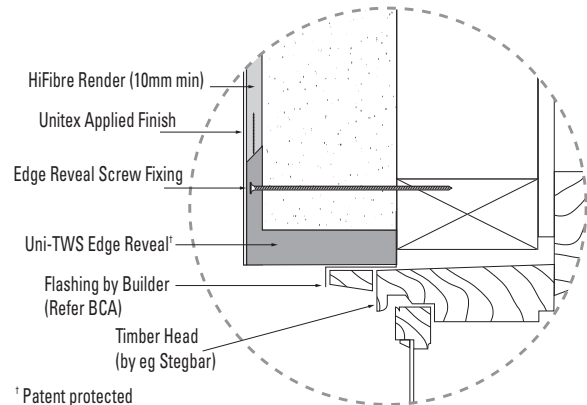
Drawing 25
Uni-TWS: Cross Section View of Window Reveals



NOTE:
 Typical Timber awning style window (eg Stegbar WRC)

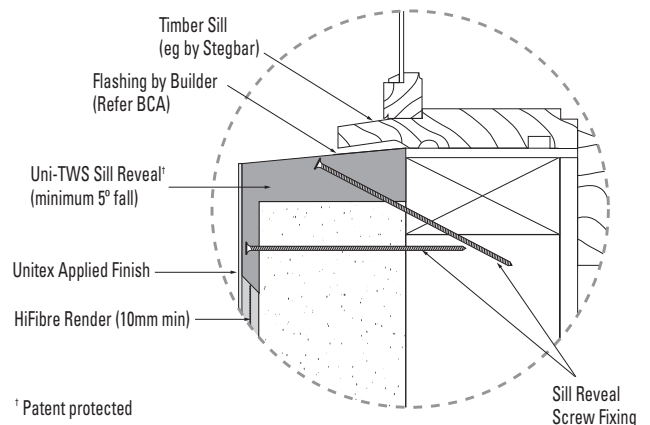
† Patent protected

Drawing 26
Uni-TWS: Cross Section of Window Edge Reveal† - Detail



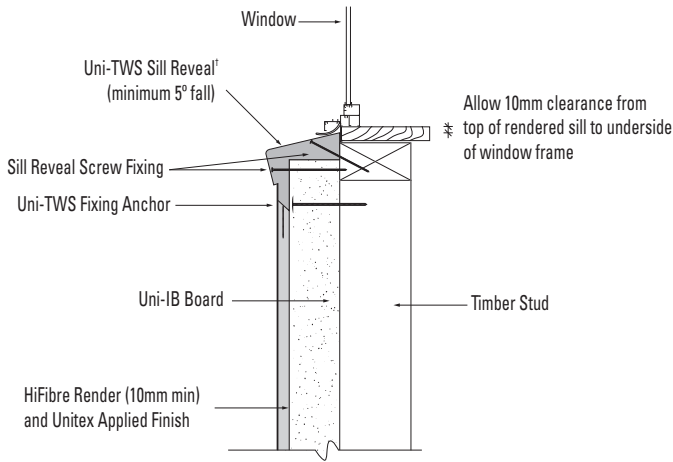
† Patent protected

Drawing 27
Uni-TWS: Cross Section View of Window Sill Reveal† - Detail



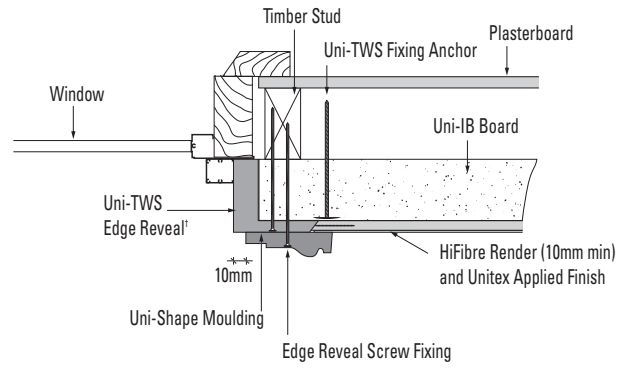
† Patent protected

Drawing 28
Uni-TWS: Cross Section View of Window Sill Reveal (alternative)



† Patent protected

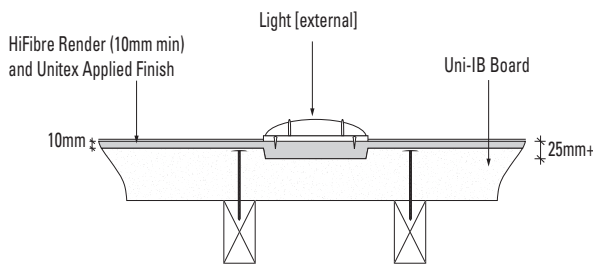
Drawing 29
Uni-TWS: Uni-Shape Facade Profile with Fixing - Plan View



NOTE:
 A Unitex protective membrane coat - either Uni-PTC or Uniflex Membrane - pigmented to match the Unitex Applied Finish, is painted over the surface of the moulding.

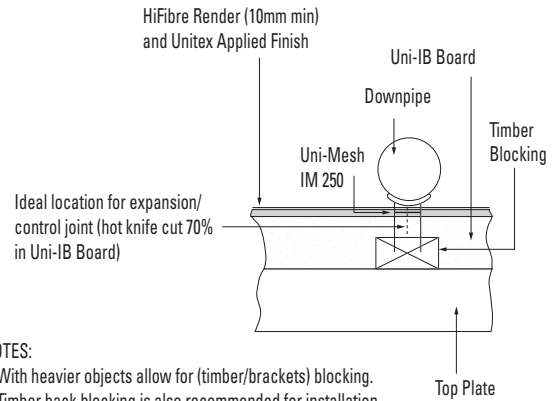
† Patent protected

Drawing 30
Uni-TWS: Fixing of lightweight Objects [e.g. external light] to Uni-TWS



- NOTES:**
- For lighter objects fixed to wall allow for HiFibre layer coat to be approximately 25mm depth [cut to depth]. Remove Uni-IB Board material to depth of \approx 25mm. Fill cavity, with HiFibre Render \approx 25-30mm depth.
 - For awnings fix brackets to timber studs/noggings prior to Uni-IB Board installation.

Drawing 31
Uni-TWS: Fixing of heavy objects [e.g. drainage pipe] to Uni-TWS



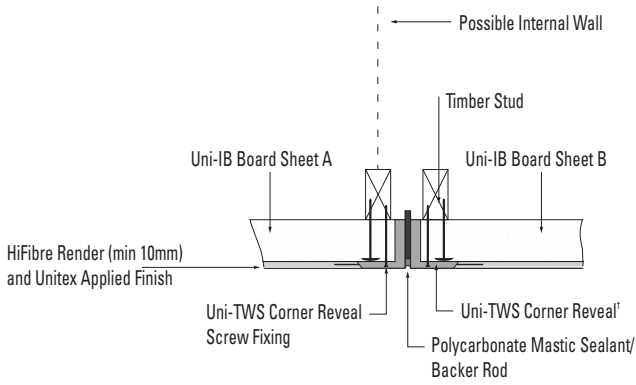
- NOTES:**
- With heavier objects allow for (timber/brackets) blocking.
 - Timber back blocking is also recommended for installation of larger Uni-Shape Mouldings.
 - Generally two sheets of Uni-IB Board would be joined at this weakened position and strengthened with Uni-Mesh IM 250.
 - Or an ideal positioning for expansion/control joint. Refer text for details.

Drawing 32
Uni-TWS: Rough guide for placement of Control / Expansion Joints [if no other information available] - Front Elevation only shown (Use same principles for other elevations)



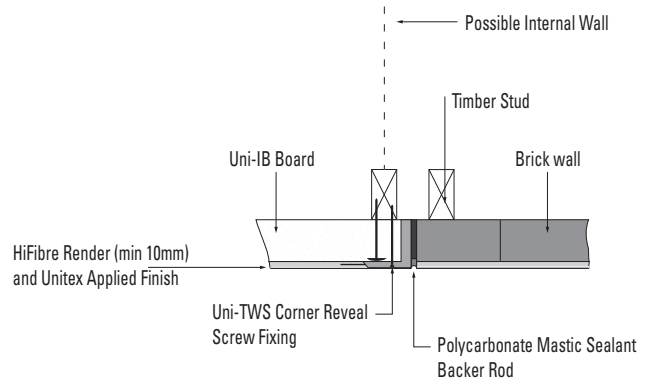
- NOTES:**
- Expansion/Control Joints are required for every elevation.
 - At all dissimilar substrate material junctions expansion/control joints must be installed. eg brick to Uni-IB Board, block to Uni-IB Board (refer to subsequent drawings)
 - Vertical expansion joints must be installed every 6-8m minimum.

Drawing 33
Uni-TWS: Expansion Joints [vertical]

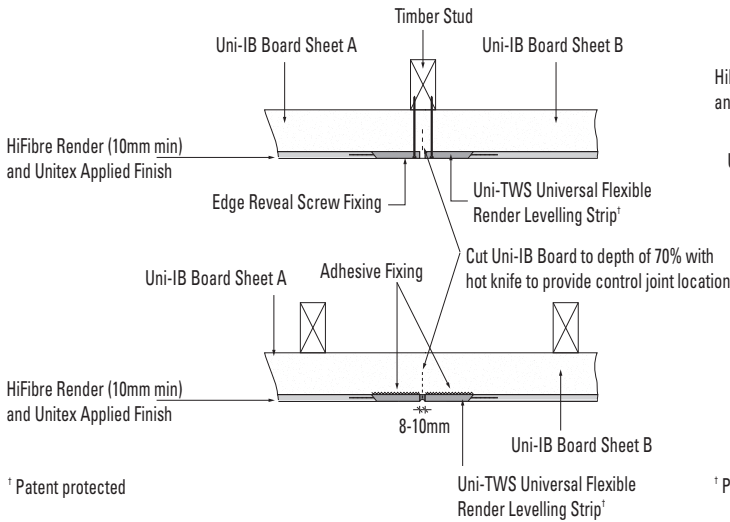


† Patent protected

Drawing 34
Uni-TWS: Dissimilar Substrates Expansion Joints [vertical]

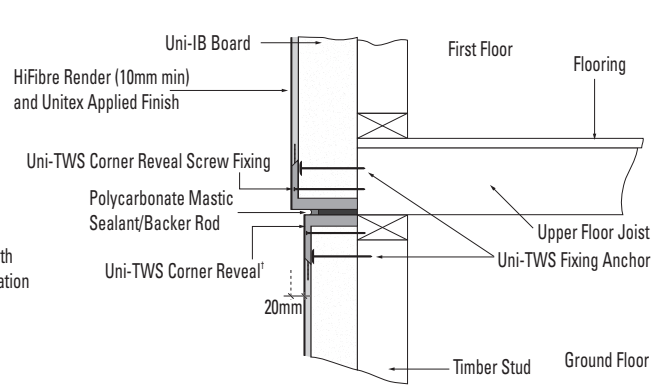


Drawing 35
Uni-TWS: Control Joints [vertical] - Plan View



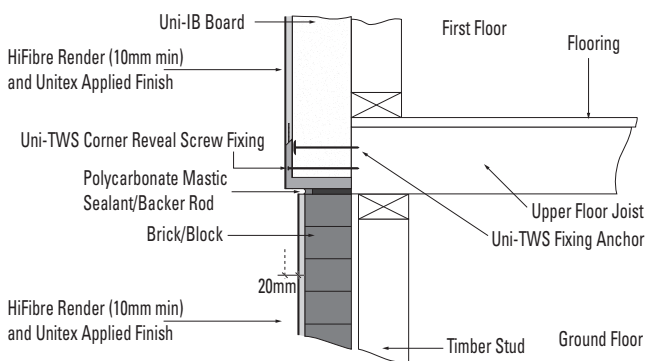
† Patent protected

Drawing 36
Uni-TWS: Expansion Joints [horizontal]



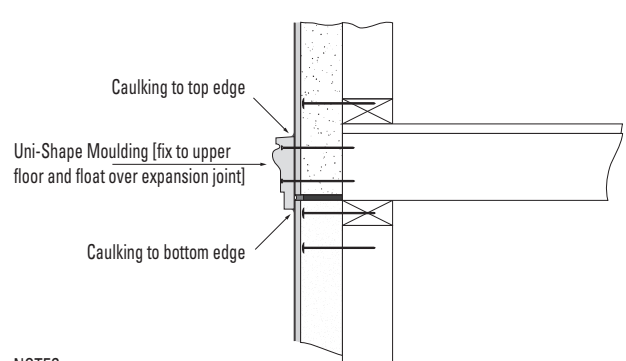
† Patent protected

Drawing 37
Uni-TWS: Dissimilar Substrates Expansion Joints [horizontal]



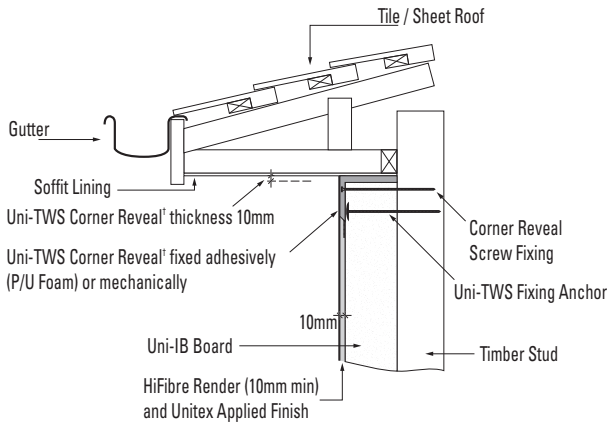
† Patent protected

Drawing 38
Uni-TWS: Fitting of Uni-Shape Moulding over horizontal expansion joint



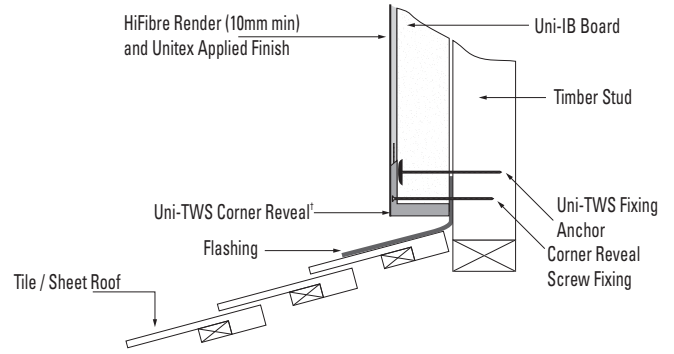
- NOTES:
1. It is recommended that a horizontal expansion joint be placed between each level.
 2. The ultimate responsibility for determining the location of expansion joints is with the Designer / Engineer / Builder.

Drawing 39
Uni-TWS: Fixing of Uni-TWS Corner Reveal[†] as Soffit Lining



[†] Patent protected

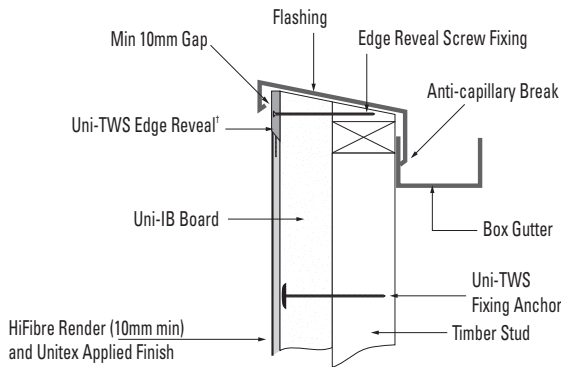
Drawing 40
Uni-TWS: Second Storey



NOTE:
 Bottom edge of Uni-IB Board should never be left exposed to the weather.

[†] Patent protected

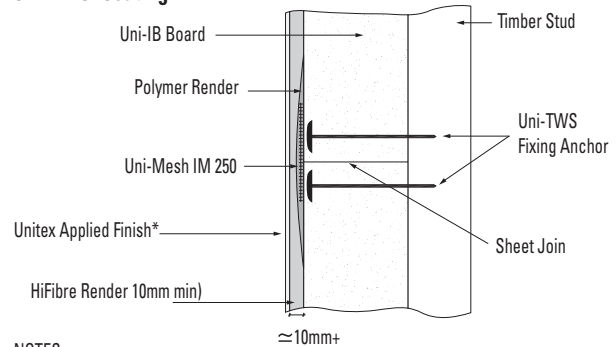
Drawing 41
Uni-TWS: Parapet Facade



NOTE:
 The flashing angle and relevant details as determined by Engineer's specifications.

[†] Patent protected

Drawing 42
Uni-TWS: Coating



NOTES:
 1. Polymer Render locks in the Uni-Mesh IM 250 which provides additional strength, to the render and finish, over joints.
 2. HiFibre Render is a fibre-reinforced, render coating designed to provide high impact strength protection of the Uni-IB Board insulating foam sheet.

* Either a wet, ready-to-use Uni-Trowel or Uni-Roll Décor e.g. 155/104/107, or a dry powder (just add water) such as 855/804/807/809. For additional protection overcoat with pigmented Uni-PTC or Uniflex membrane.

Specifier's Clause:

The external facade (insulating lightweight cladding) shall be the Uni-TWS[®] as described under CSIRO Appraisals Technical Assessment #310, and detailed in the Uni-TWS[®] Manual (dated October 2003). It shall have the following characteristics:

1. Soft-body Impact Strength minimum of 45 joules.
2. Minimum coating thickness of 10mm of fibre reinforced render.
3. Edge and Sill Reveals[†] with minimum 20mm thickness returns.
4. A 'complete wall' R-value tested result of 2.17 (based on 75mm thick EPS foam fitted over typical stud framing).

It shall be supplied by Unitex Granular Marble Pty Ltd and shall be installed as per the Uni-TWS[®] Manual by skilled tradespeople.

Unitex Granular Marble Pty Ltd 22 Park Drive, Dandenong, Victoria, 3175 Australia
 Telephone: (+61 3) 9706 5279 Facsimile: (+61 3) 9706 8398 Website: www.unitex.com.au

Also available from State Franchises SA Ph: (08) 8262 7900, WA Ph: (08) 9248 8788, Branches NSW/QLD Ph: (02) 9648 5878

WARRANTY DETAILS

Unitex® Granular Marble Pty Ltd provides a seven-year warranty for defective product only (PRODUCT REPLACEMENT ONLY) against the Uni-TWS®, providing the components are of the quality specified and are applied strictly according to the guidelines laid down in this manual. This manual must be read and understood before installing Uni-TWS®.

Unitex® Granular Marble Pty Ltd cannot be held responsible – and hence no warranty applies – if the Uni-TWS® and/or its components are not supplied and installed according to the guidelines.

The selection of an applicator – to install the Uni-TWS® - is the client's responsibility. Unitex® strongly recommends previous workmanship be inspected before contracting an applicator. A minimum of three recently completed jobs should be checked first-hand by the client.

As advised above, insufficient or inadequate construction control joints could lead to cracking of the Uni-TWS®. We reaffirm that, whilst we provide recommendations as to their locations and treatment in Uni-TWS® (refer the Appendix drawings), this is not covered by the warranty. The placing of control joints is ultimately the responsibility of the Builder/Engineer/Specifier and not Unitex® Granular Marble Pty Ltd.



Specifiers & builders should visit our web-site for technical information:

Detailed technical information on individual components of the system are available as downloadable documents:
www.unitex.com.au

The information contained in this document is based on data available at the time of writing, which we believe is accurate and reliable. Unitex reserves the right to change the information without prior notice.

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