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Technical guide

Contractor Manual





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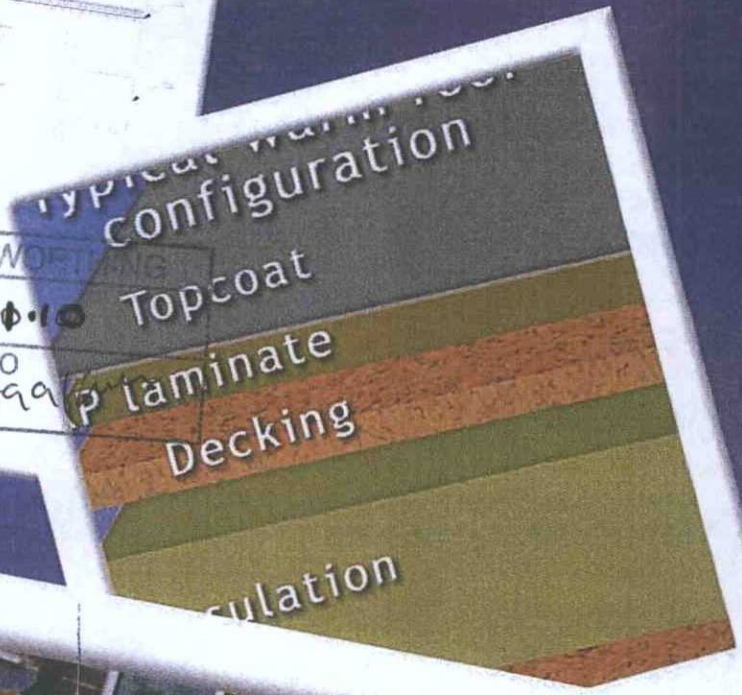

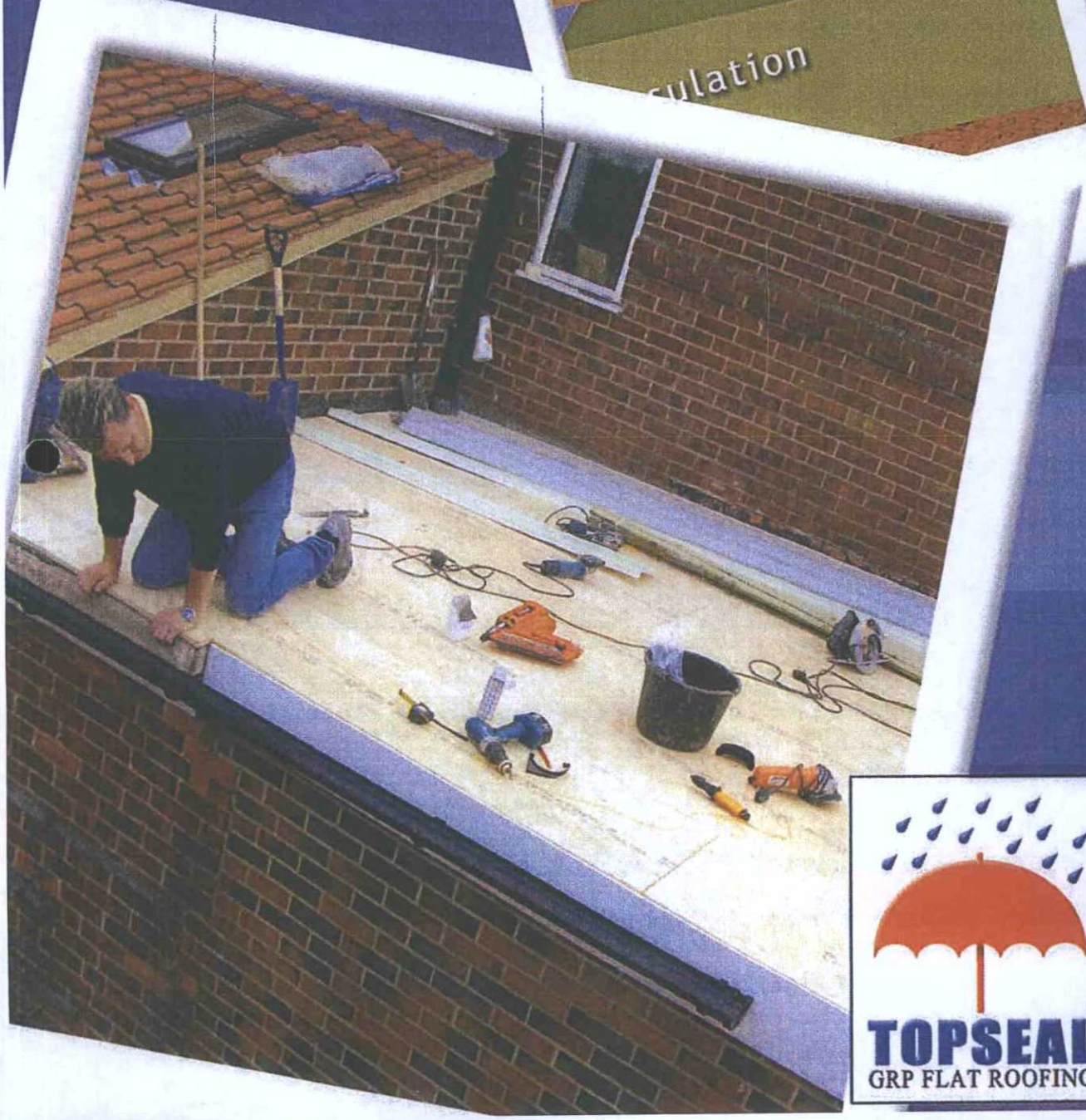

TOPSEAL®
GRP FLAT ROOFING

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Contractor Manual

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Datasheet

Product Name: Topseal GRP Roofing

Topseal's single-ply GRP laminate can be installed to any size, in any BS4800 colour and to any degree of complexity, without any seams, welds or joints and it comes with a minimum 20 year protected guarantee.

Standards Compliance

BBA (British Board of Agrément) Certificate Number: 93/2932 (can be viewed online at: www.bbacerts.co.uk)

Resins to BS3332 and BS2782, CSM to BS3496 and colours to BS4800.

Fire retardant to class 1 if required.

Calculated 'U' value = 0.24W/m²K (Calculated in accordance with BS EN ISO 6946 (when laid to 'warm roof' specification.)

Finish Options

Colour range: Topseal is available in a choice of 2 shades of grey as standard: Cool Grey, Dark Admiralty.

Topseal holds a stock of its most popular BS4800 colours (colour chart available on request.) A Topseal roof can be specified in any BS4800 colour.

A Topseal roof can be specified with a non-slip aggregate finish.

Properties and Performance

Weatherightness (Excerpts from BBA certificate.)
The system is impervious to water and, when used in the systems described will give a weatheright roofing capable of accepting minor structural movements without damage.

Resistance to wind uplift
The system has adequate resistance to the effects of wind suction likely to occur within practice.

Properties in relation to fire
A system comprising Topseal applied to an 18mm thick Sterling Board substrate, when tested to BS 476: Part3: 1958, was designated EXT.F.AA.A system comprising Topseal laminate applied to 15mm OSB/3 board when tested to prEN 1187; tests 1, 2 and 3, achieved Classification Broof (t1) Broof (t2) and Broof (t3) respectively.

Durability
A Topseal GRP laminate constructed in accordance with the installation guide and formed in satisfactory weather conditions can be expected to maintain its integrity and show no measurable loss of physical properties for a period of 30 years or more.

Test (Units)	Method	Mean Result
Thickness (mm)	Dial Gauge	1.75
Apparent density (kgm-3)	ISO 1183	1360
Glass/Resin Ratio	BS.2782	3.5:1
Barcol Hardness	BS.2782	35

General information

General application information

Application

A Topseal laminate is constructed from 4 main components: 18mm OSB3 T&G boards, Topseal roofing resin, Topseal 450g/m² Chopped Strand Mat and Topseal Topcoat. The roof is made the Topseal laminate laid in situ over the OSB3 decking constructed as shown below. The resin is applied at a ratio of 3:1 (weight of resin to glass) which gives a practical estimate of 1.5kg per m² when accounting for wastage. Topcoat is applied at a rate of 0.5kg per m². For further direction on the installation of a Topseal roof, refer to the Installation Manual.

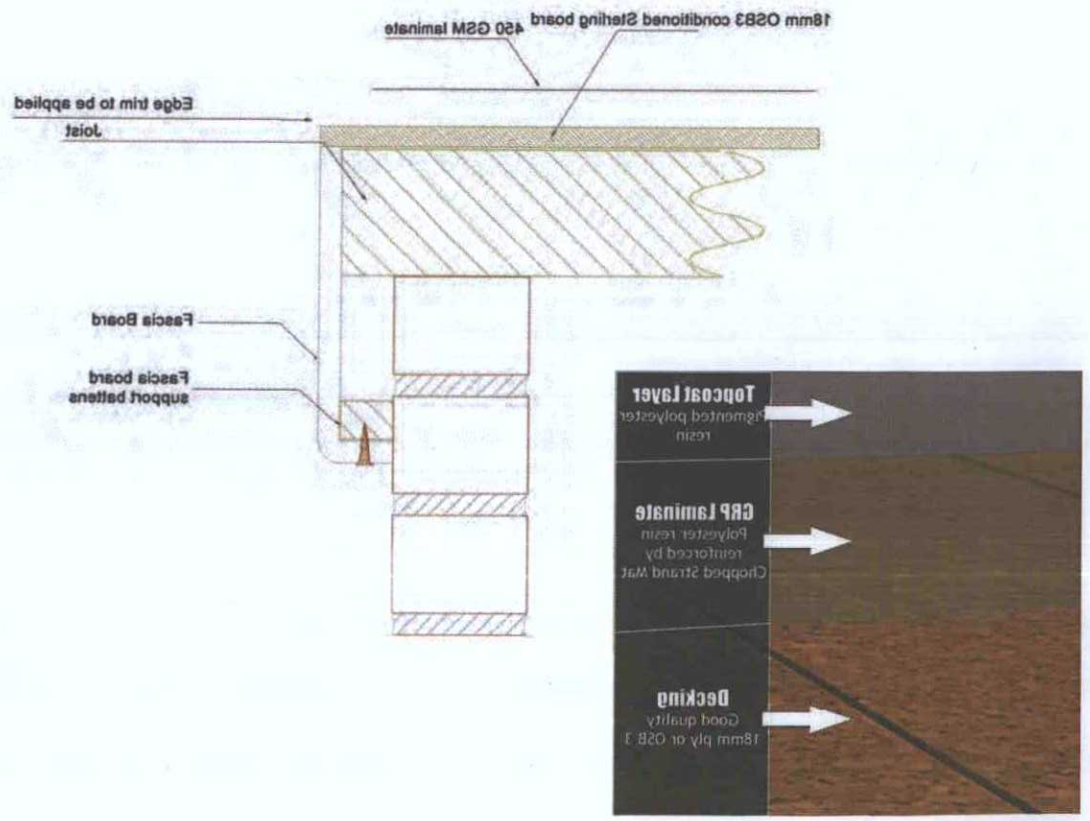
Quantity estimation

The values given below are only an estimate and will depend on the complexity of the roof surface. The quantities for decking boards are based on an exact calculation of the area of coverage of each board, in practice, this should be considered a conservative estimate. For a more comprehensive materials estimate please refer to the materials estimation table in the installation manual.

Roof Size (M²)	Topseal Resin (Kg)	Topseal Topcoat (Kg)	Topseal 450g/m² CSM (Kg)	OSB3 T&G Boards (8'X2')
10	15	5	4.5	7
20	30	10	9	14
30	45	15	13.5	21
40	60	20	18	28
50	75	25	22.5	35
60	90	30	27	42
70	105	35	31.5	49
80	120	40	36	56
90	135	45	40.5	63
100	150	50	45	69

Warm and Cold Roof Specification

Topseal can be installed in both a cold or warm roof configuration. A typical cold roof configuration is shown below:



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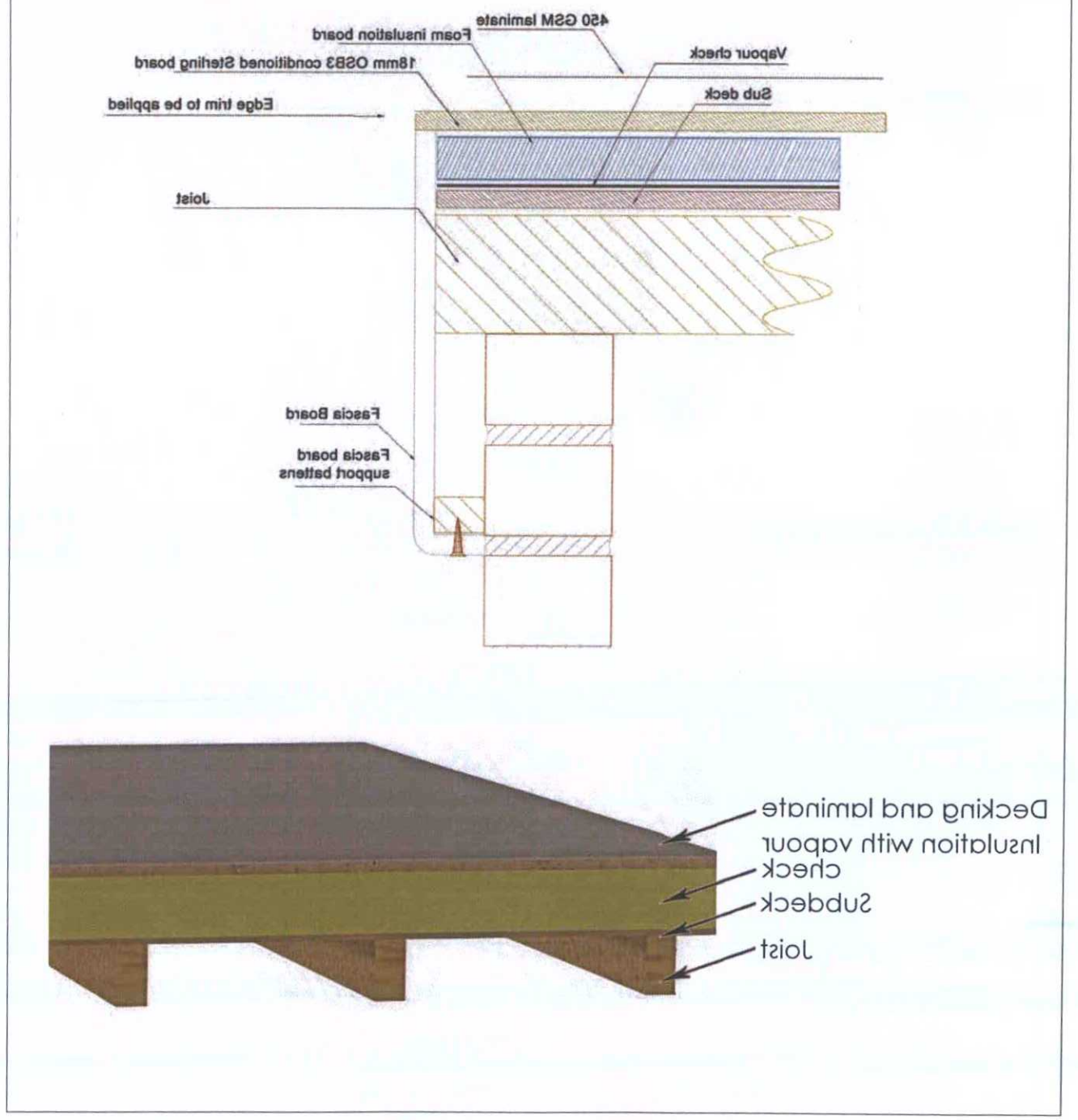
Warm roof specification

Application instructions

A warm roof can be easily incorporated into a Topseal roof. A sub-deck is first fixed to the joists and should be fixed to the joists and should be fixed at 300mm centres. Then a vapour check and insulation sheets can be laid over the top. Insulation sheets can also be bought with a vapour check adhered to one side. The decking should then be laid on top as it normally would be, screws should be used to fix the boards to the joists, these should penetrate through the insulation and into the joists with the same depth as standard fixings. It is imperative that all layers of the roof are pressed firmly together and that there are no gaps between any of the layers. The GRP should then be laminated over the top of the roof as normal. These roofs will usually require larger edge trim sizes such as A2S0 and B300. To comply with Part L Regulations of Jan 2006 the following specification would be required to obtain a 'U' value of 0.24 installed as shown below:

12mm Ply Sub Deck
85mm of KingSpan TR26 or equivalent
18mm T&G OSB3 board
Topseal Laminate

Cross-section of warm roof onto decking

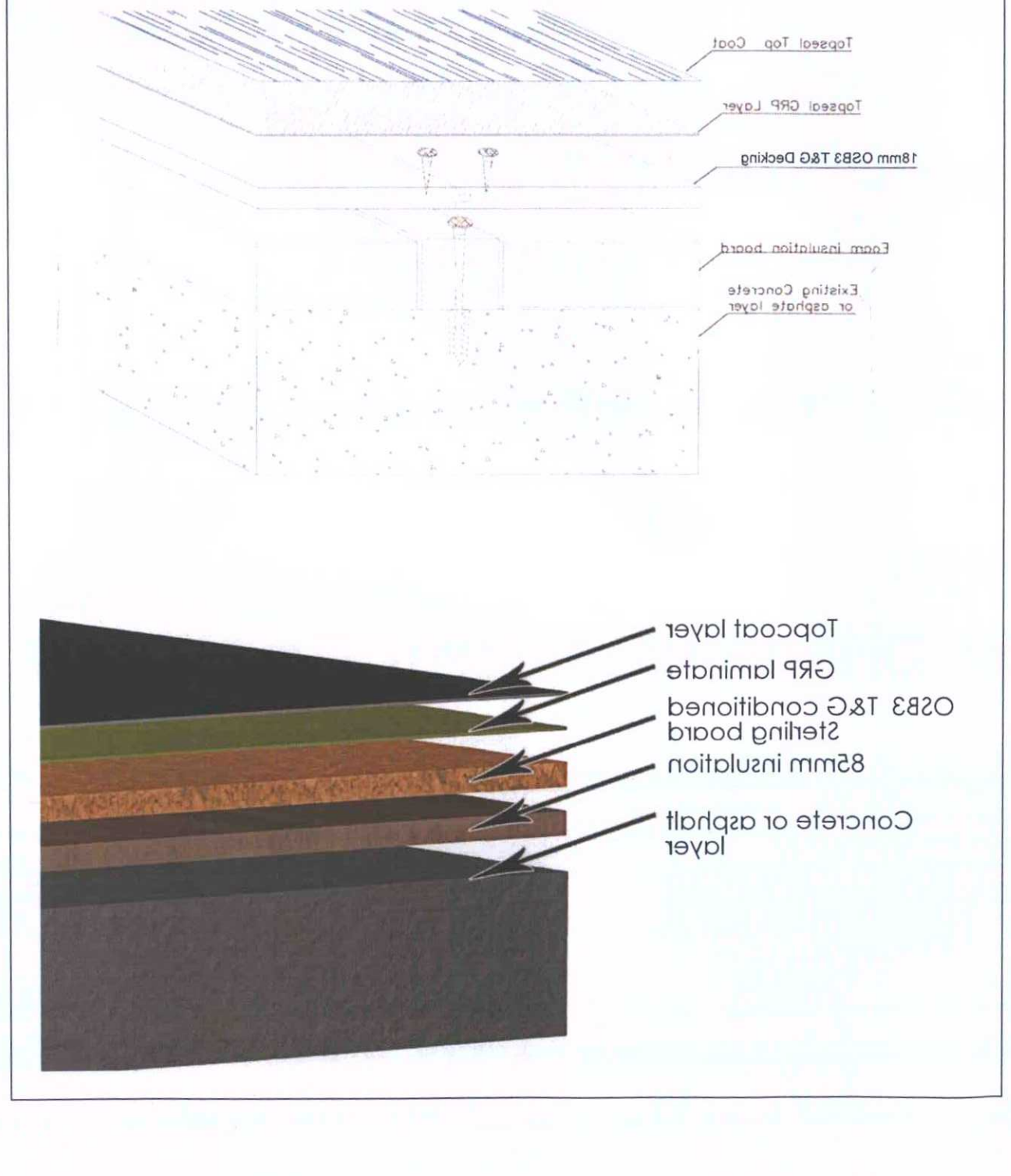


Warm roof onto concrete or asphalt

Application instructions

When installing a warm roof onto a concrete substrate, it is important that the existing concrete or asphalt layer is completely dry, clean and in good condition. Battens the same thickness as the insulation boards used should be solidly attached to the concrete at 300mm centres. The Sterling board should then be fixed to the battens using the same fixings as would normally be used. Ensure there are no gaps between the layers. The laminate can then be laid over the top as normal.

Cross-section of warm roof onto concrete or asphalt



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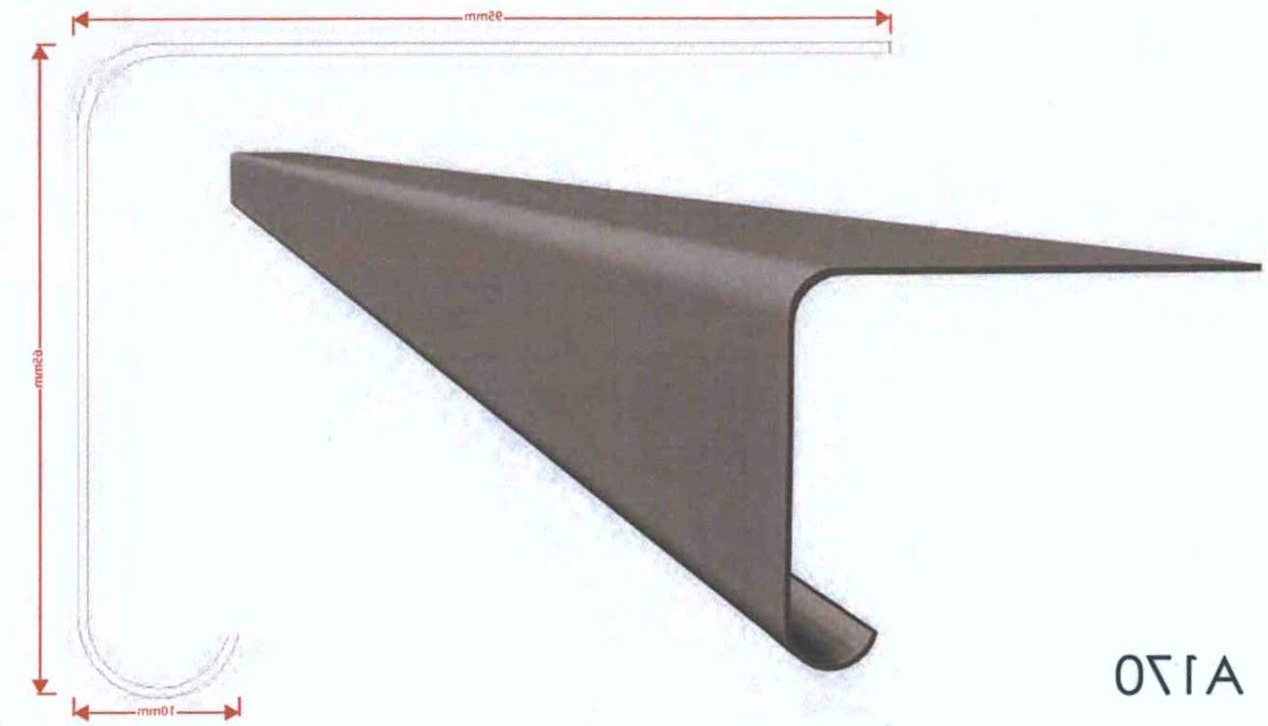
Technical information

A170- Fascia trim

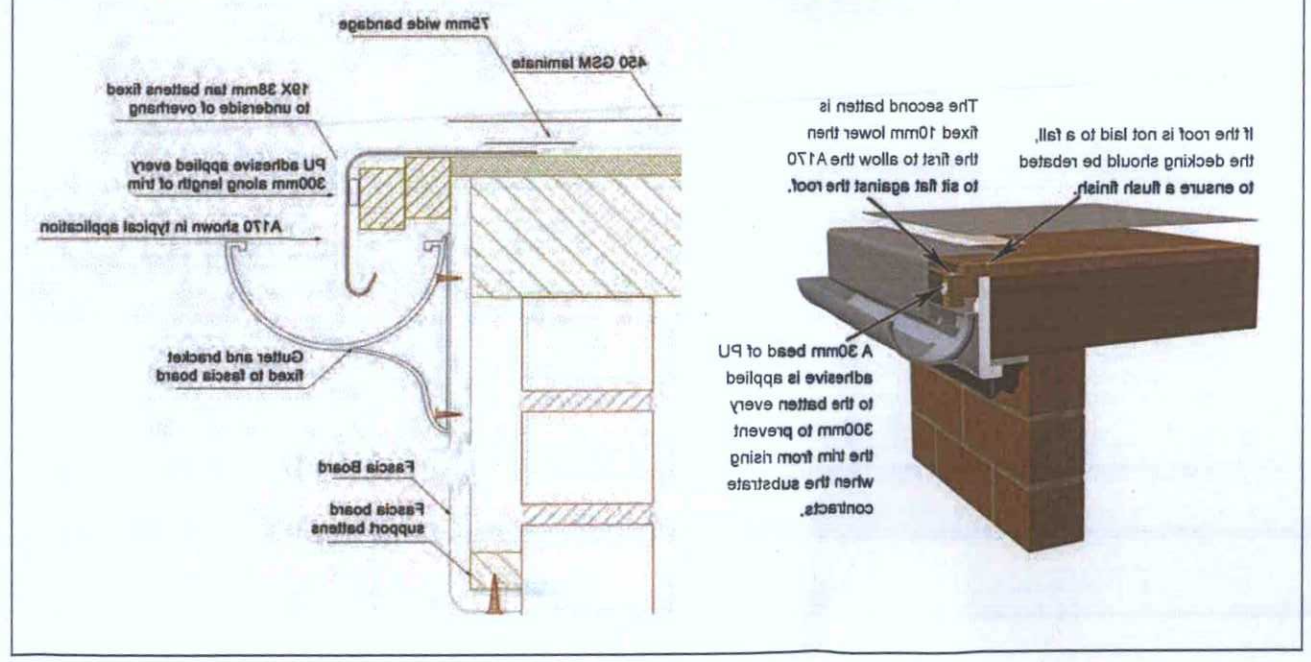
Application instructions

The A170 (or Mini A) is designed for applications where it is not possible to use the larger A200. The A170 is a drip trim, fitted to the lowest edge of the roof usually where the rainwater flows into the gutter. The batten for the A170 should be doubled up to provide a stand off for the gutter to fit behind the trim, with the outer batten 10mm lower than the inner batten to allow for the radius of the trim. Apply trim adhesive to the batten in 30mm beads at 300mm centres, rub the trim into place and nail to the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. If the pitch of the roof is only minimal, rainwater is likely to be held behind the trim. Use a planning machine to take 2mm off the deck to allow the trim to lay flush with the board. As with all of Topseal's extruded profiles, the A170 is supplied in 3 metre lengths.



A170

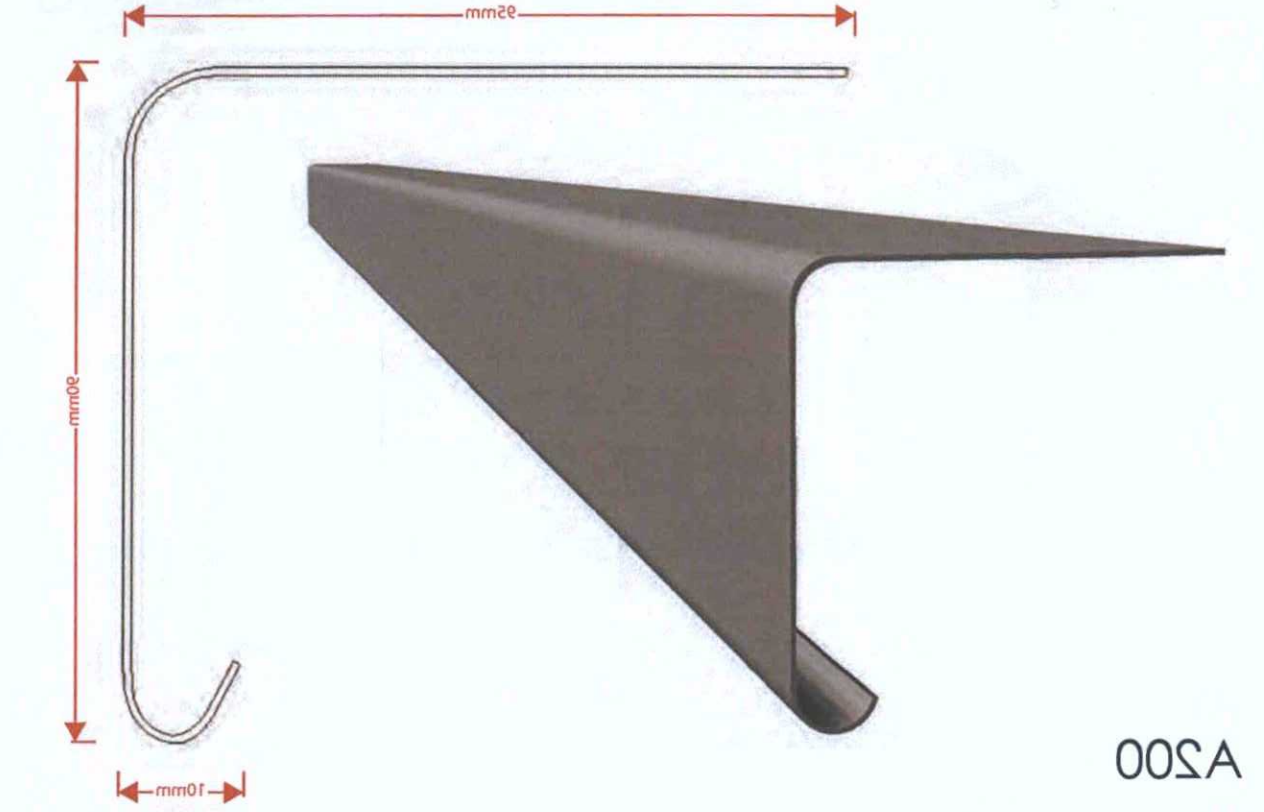
A170 typical application



A200- Fascia trim

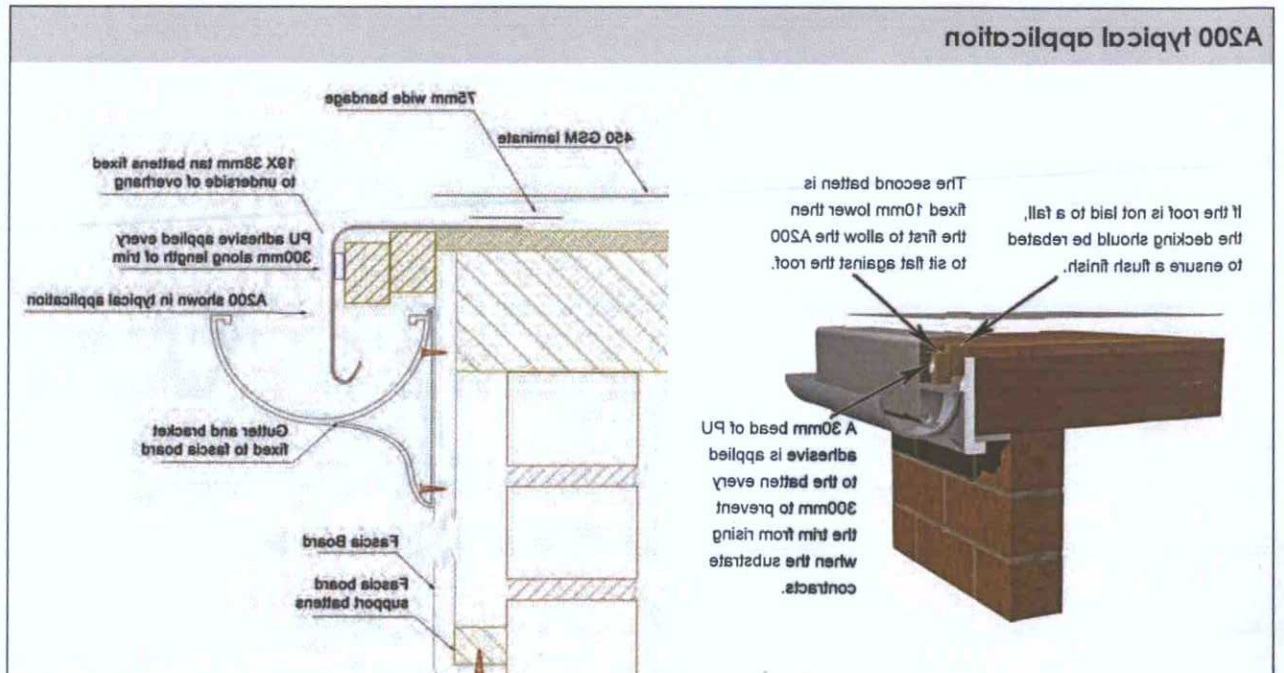
Application instructions

The A200 is compatible with C1, C2 & C4 universal corners. The A200 is a drip trim, fitted to the lowest edge of the roof usually where the rainwater flows into the gutter. The batten for the A200 should be doubled up to provide a stand off for the gutter to fit behind the trim, with the outer batten 10mm lower than the inner batten to allow for the radius of the trim. Apply trim adhesive to the batten in 30mm beads at 300mm centres, rub the trim into place and nail to the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. If the pitch of the roof is only minimal, rainwater is likely to be held behind the trim. Use a planning machine to take 2mm off the deck to allow the trim to lay flush with the board. As with all of Topseal's extruded profiles, the A200 is supplied in 3 metre lengths.



A200

A200 typical application



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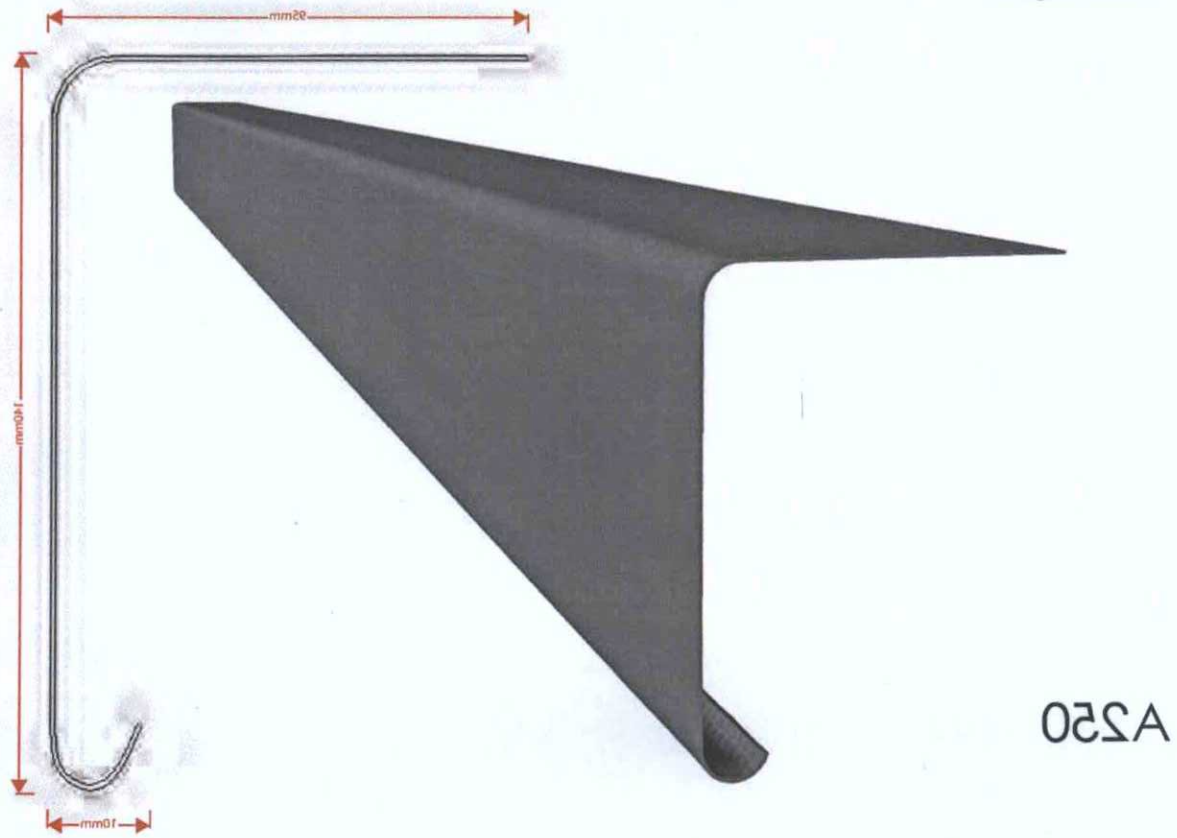
A250- Fascia trim

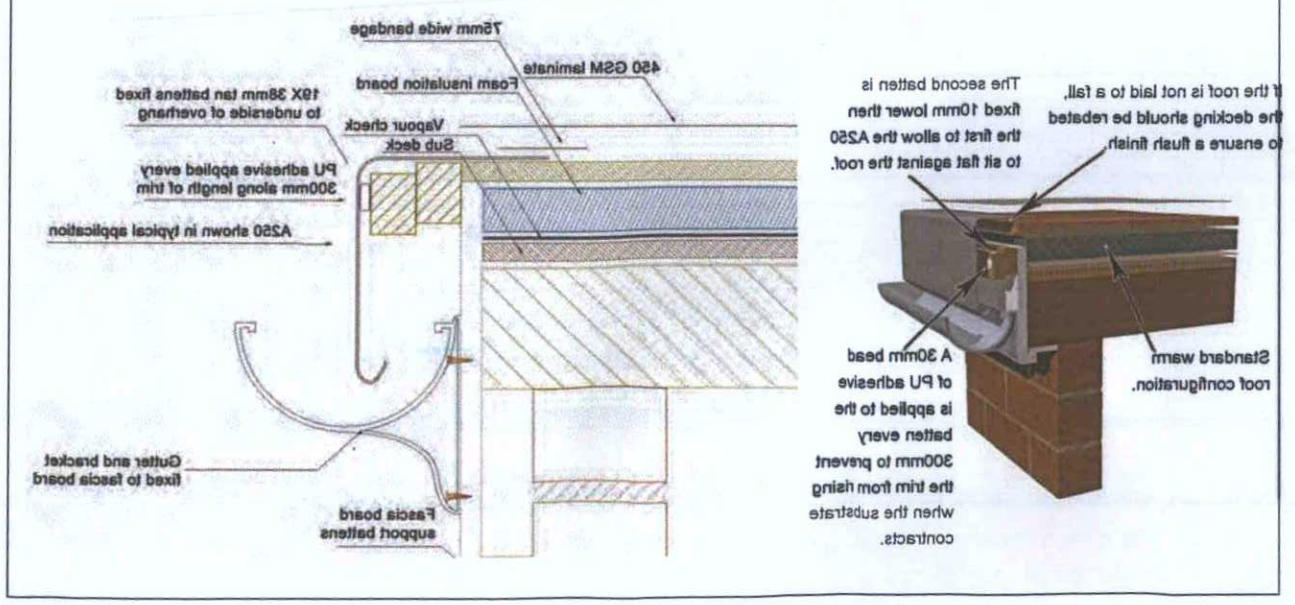
Application instructions

The A250 is designed to cover insulation so is ideally suited to use with warm roofs and has an extra deep fascia to allow gutter penetration. The A250 is a drip trim, fitted to the lowest edge of the roof usually where the rainwater flows into the gutter. The batten for the A250 should be doubled up to provide a stand off for the gutter to fit behind the trim, with the outer batten 10mm lower than the inner batten to allow for the radius of the trim. Apply trim adhesive to the batten in 30mm beads at 300mm centres, rub the trim into place and nail to the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. **If the pitch of the roof is only minimal, rainwater is likely to be held behind the trim. Use a planning machine to take 2mm off the deck to allow the trim to lay flush with the board. As with all of Topseal's extruded profiles, the A250 is supplied in 3 metre lengths.**



A250

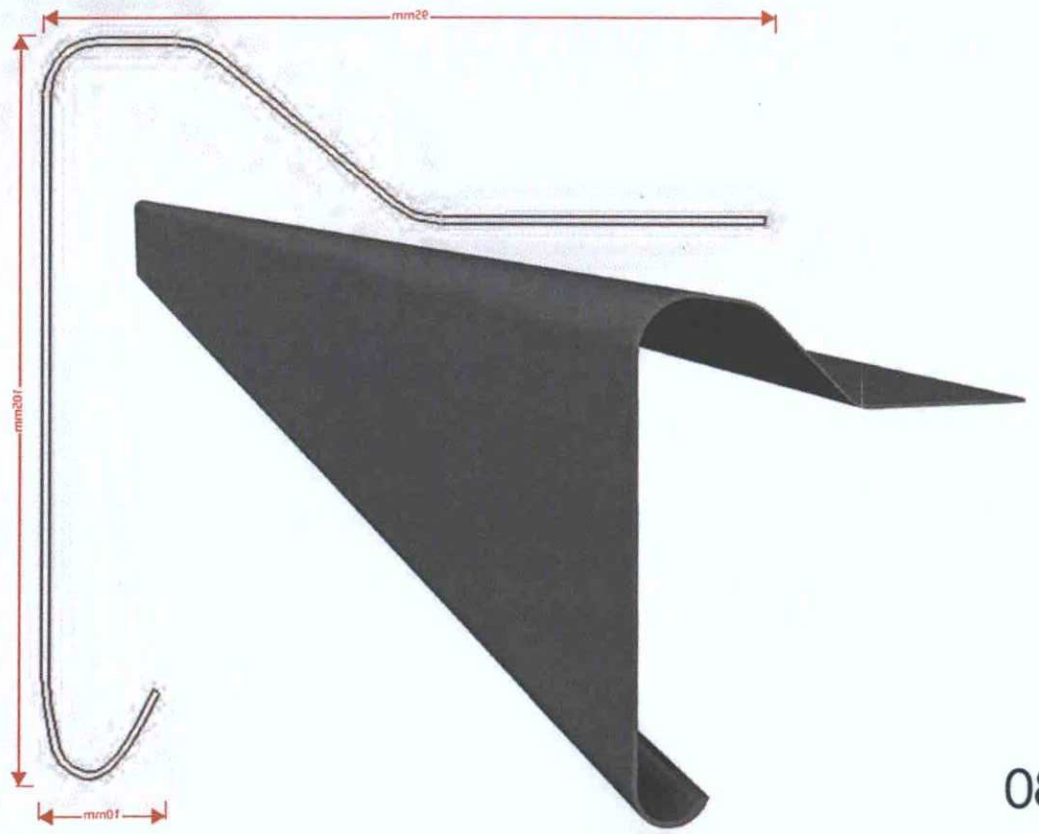
A250 typical application



B230- Raised edge trim

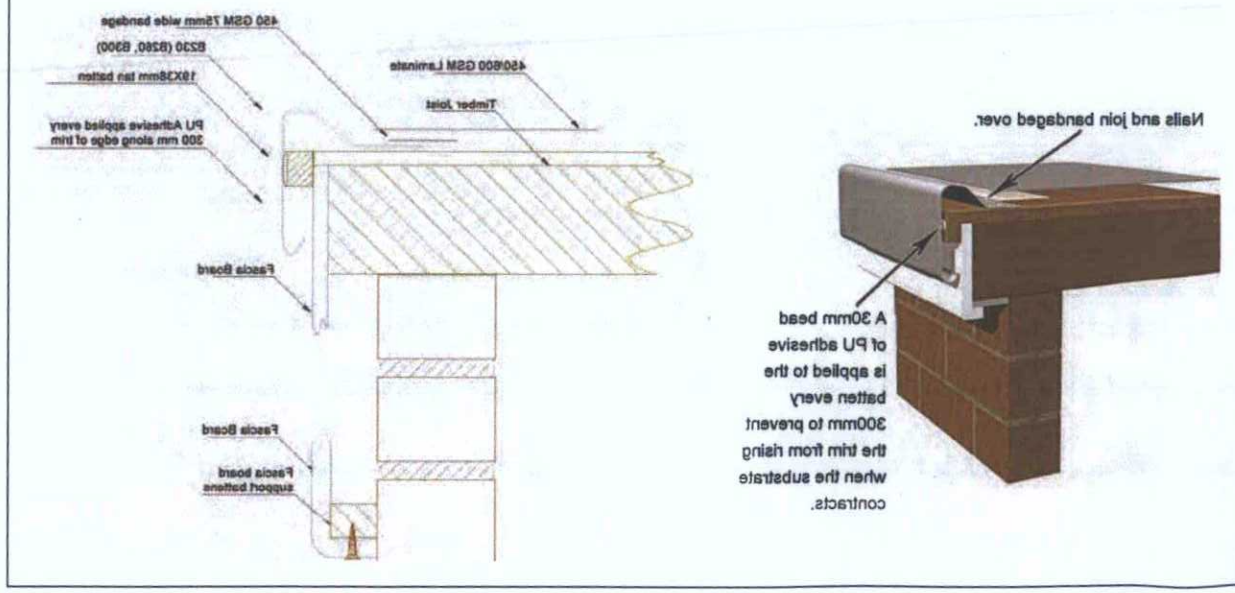
Application instructions

The B230 is an up-stand trim, fitted to contain and direct the flow of water to a gutter. A single batten is fixed level with the top edge of the deck. Apply 30mm beads of trim adhesive to the batten at 300mm centres, rub the trim into place and nail through the top of the trim into the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. If a ladder is likely to be leant against a B type trim for access to the roof, the trim will need to be reinforced to avoid deformation. The trim can either be doubled up by slotting a section of extra trim within the area where the ladder will be used or it can be reinforced with an extra layer of GRP laminate and then tissue to maintain a smooth finish. Alternately, a wooden batten can be shaped and fitted into the ridge of the trim to ensure that it remains rigid.



B230

B230 typical application



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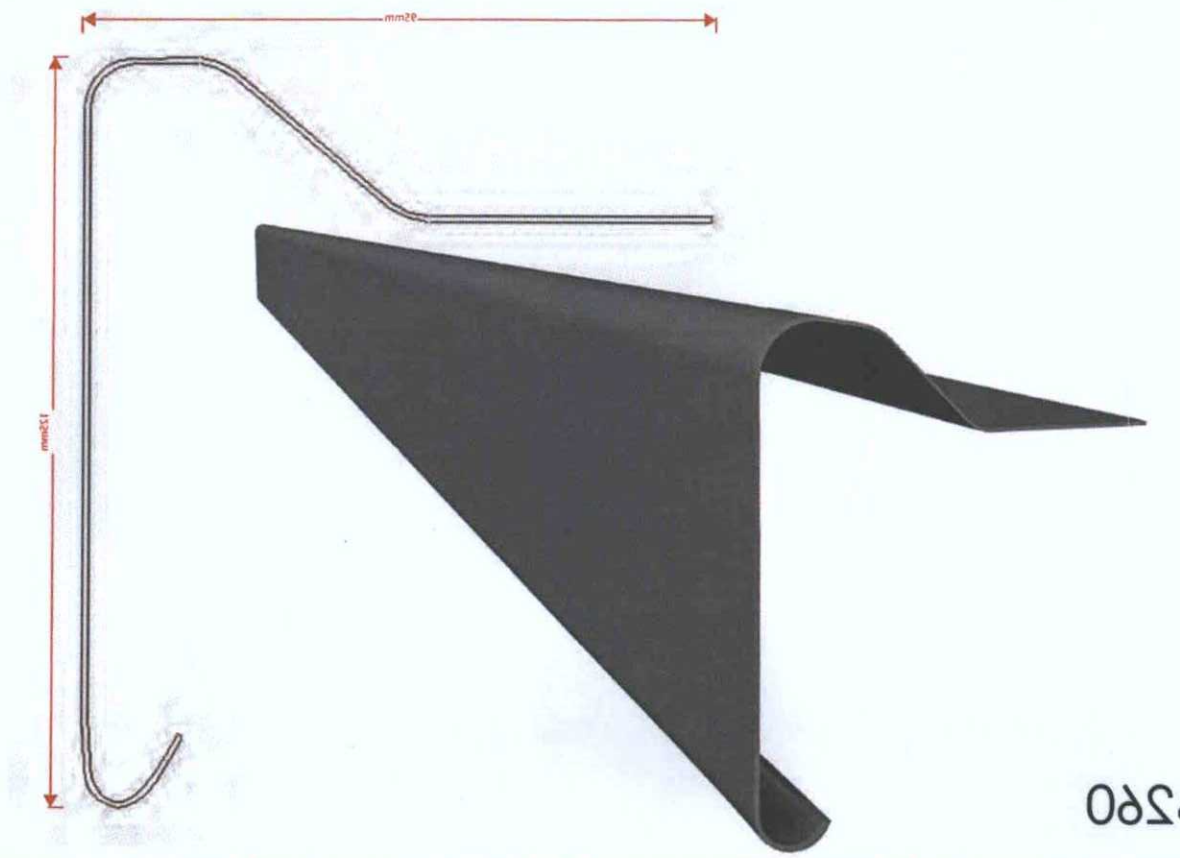
B260- Raised edge trim

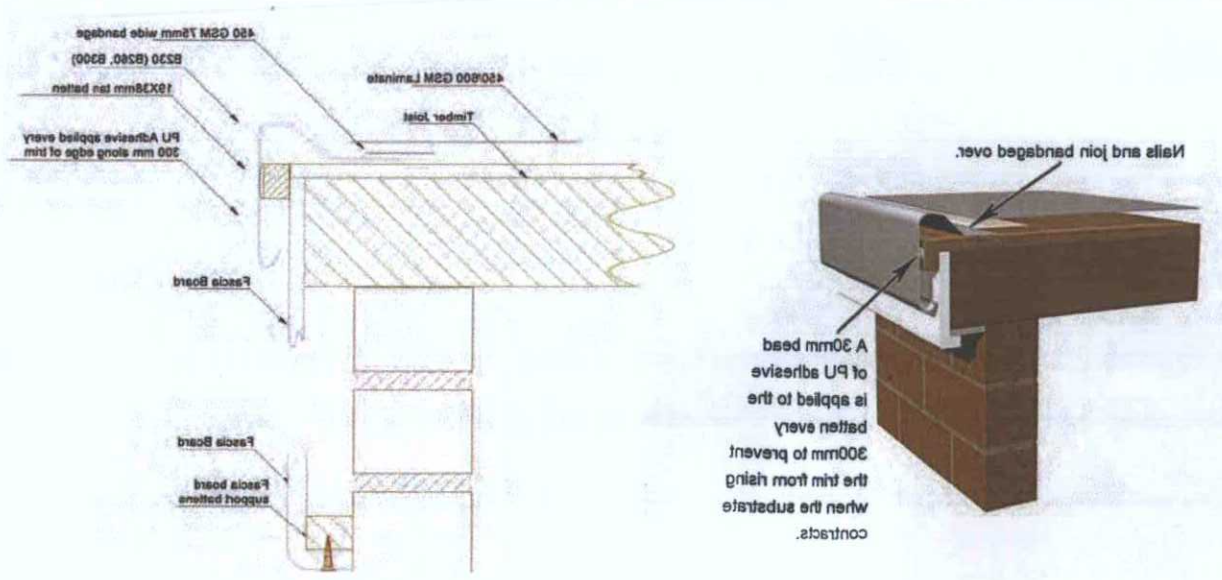
Application instructions

The B260 is compatible with C1, C2 & C4 universal corners. The B230 is an up-stand trim, fitted to contain and direct the flow of water to a gutter. A single batten is fixed level with the top edge of the deck. Apply 30mm beads of trim adhesive to the batten at 300mm centres, rub the trim into place and nail through the top of the trim into the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. If a ladder is likely to be leant against a B type trim for access to the roof, the trim will need to be reinforced to avoid deformation. The trim can either be doubled up by slotting a section of extra trim within the section where the ladder will be used or it can be reinforced by being coated with a layer of GRP laminate and then tissue to maintain a smooth finish. Alternately, a wooden batten can be shaped and fitted into the ridge of the trim to ensure that it remains rigid.



B260

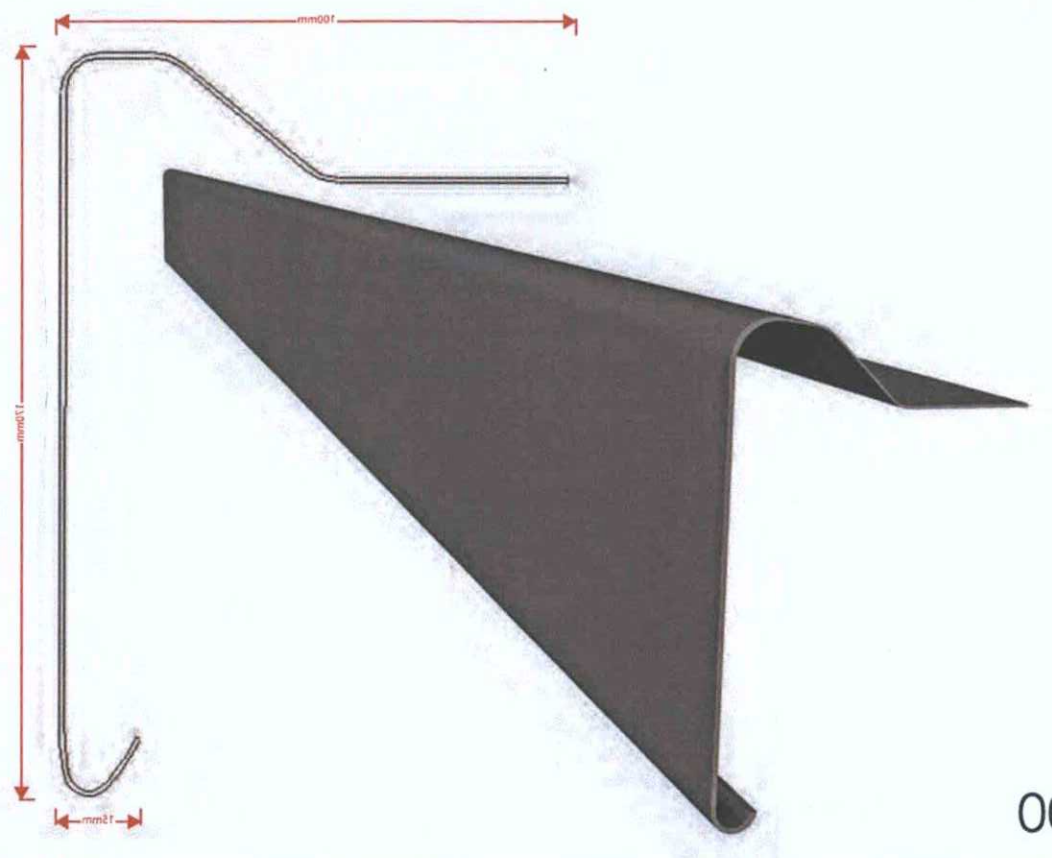
B260 typical application



B300- Raised edge trim

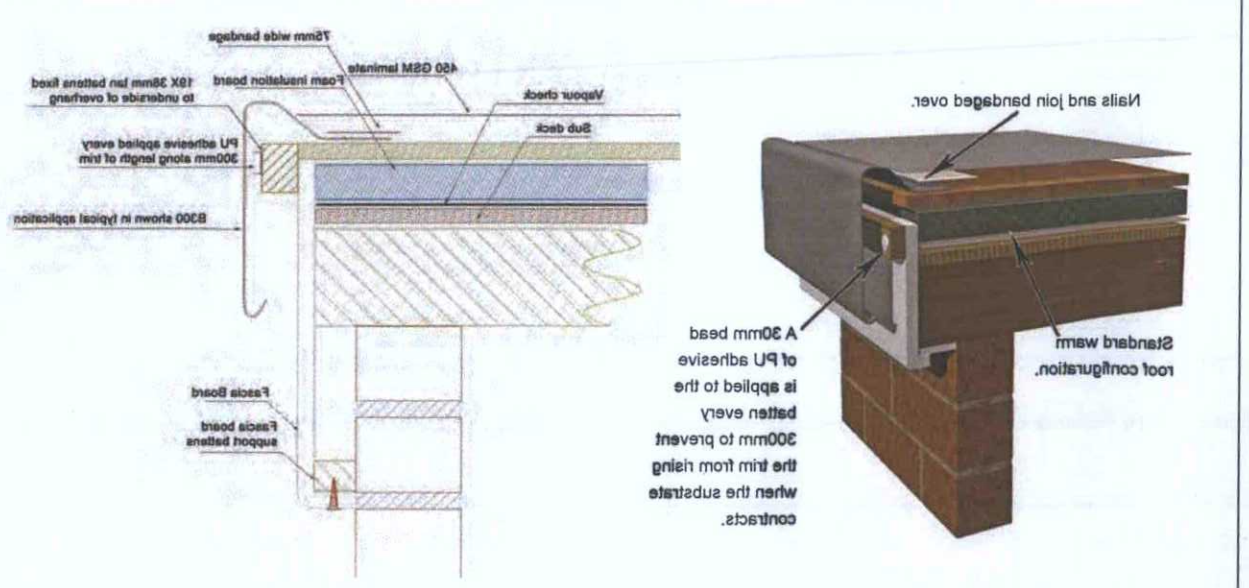
Application instructions

The B300 is an up-stand trim, fitted to contain and direct the flow of water to a gutter, its extra depth is well-suited to use on a warm roof to allow for deep gutter penetration. A single batten is fixed level with the top edge of the deck. Apply 30mm beads of trim adhesive to the batten at 300mm centres, rub the trim into place and nail through the top of the trim into the decking. Do not nail through the front of the trim. Where the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the trims are over-lapped, they should be bonded together with a thin strip of PU adhesive on the inside of the overlapping trim. If a ladder is likely to be leant against a B type trim for access to the roof, the trim will need to be reinforced to avoid deformation. The trim can either be doubled up by slotting a section of extra trim within the section where the ladder will be used or it can be reinforced by being coated with a layer of GRP laminate and then tissue to maintain a smooth finish. Alternately, a wooden batten can be shaped and fitted into the ridge of the trim to ensure that it remains rigid.



B300

B300 typical application



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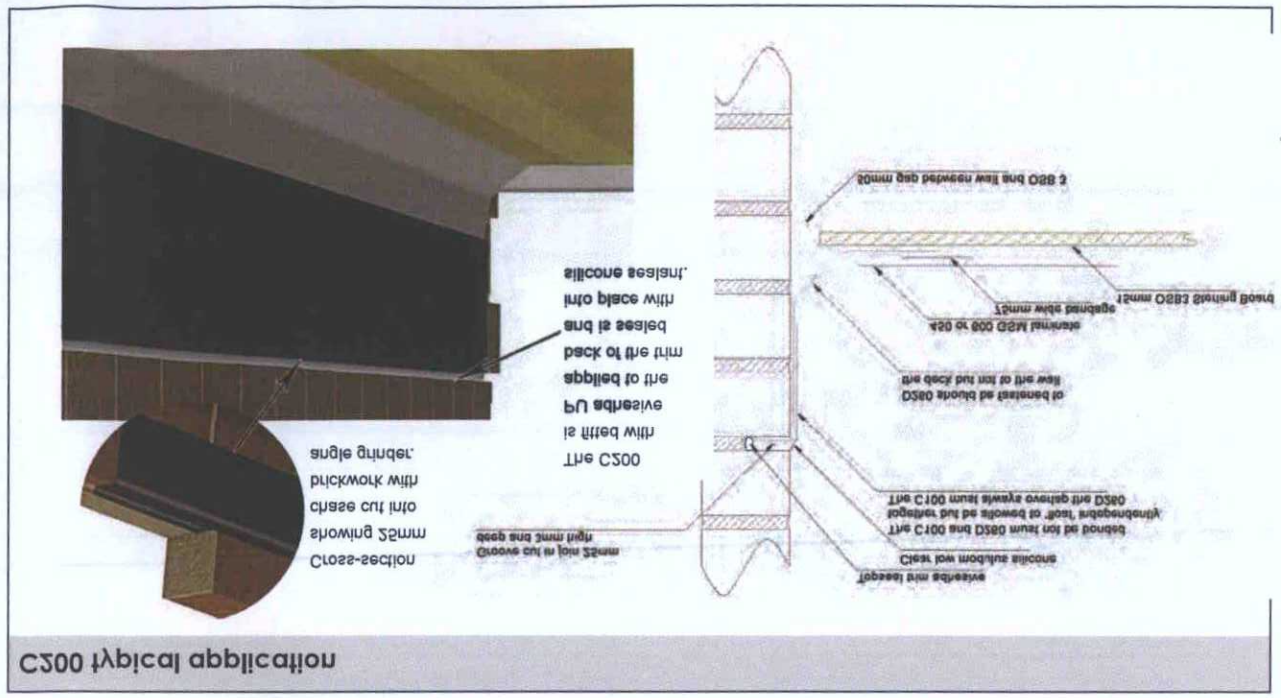
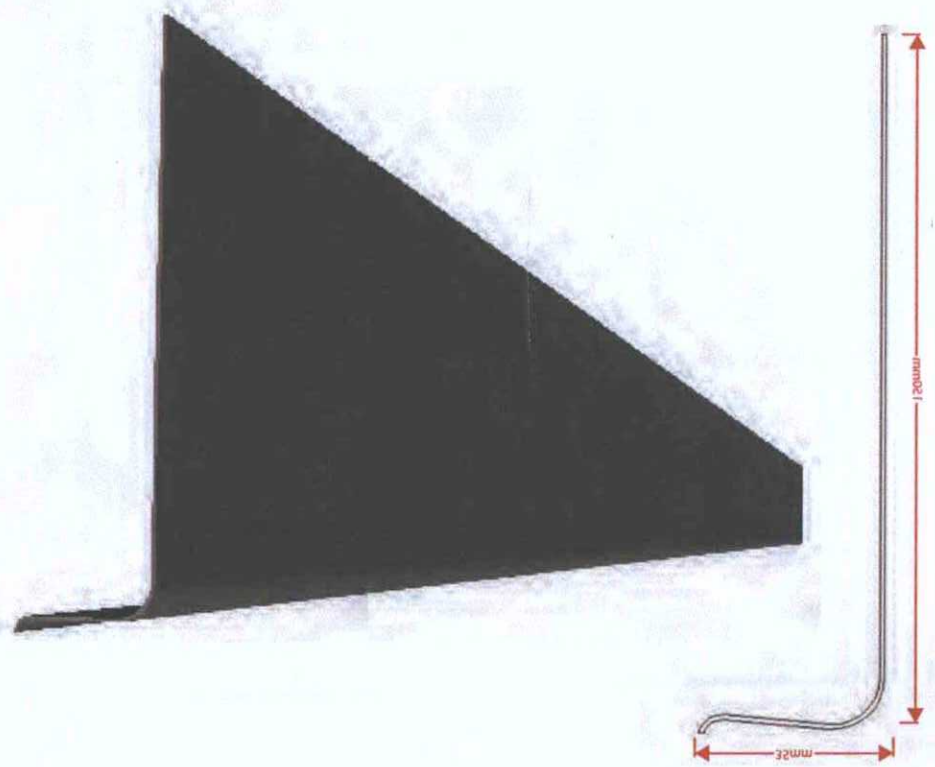
Technical Information

C200- Simulated lead flashing with moisture trap



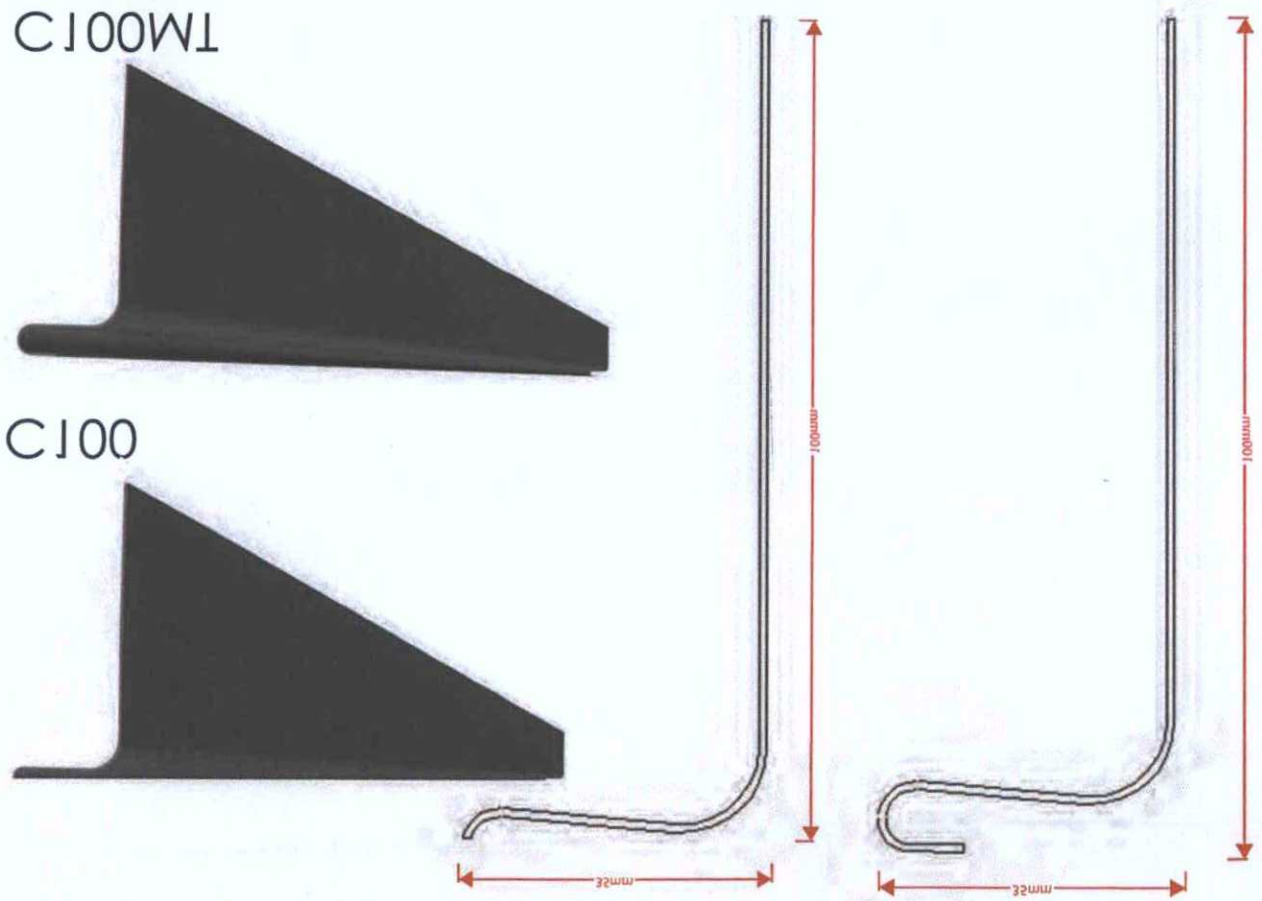
C200 typical application



Application instructions

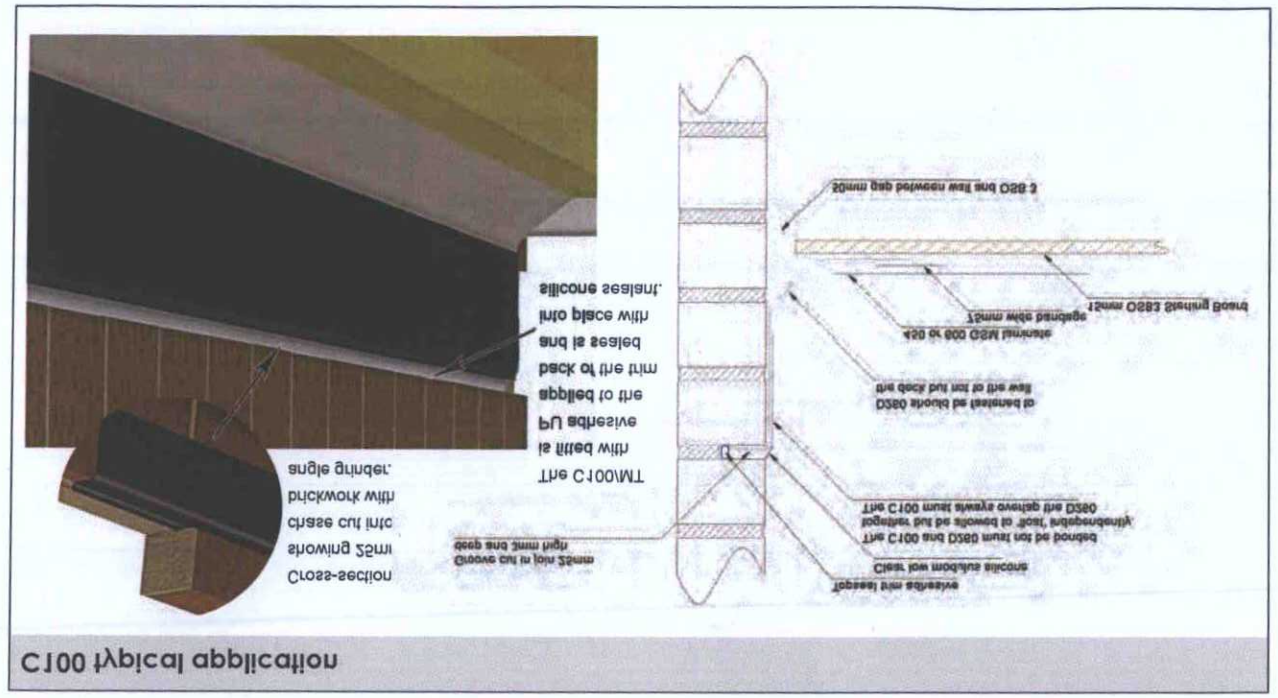
The C200 is a simulated lead flashing, generally fitted in conjunction with D250 angle fillet trim. The C200 is used for applications where the flashing needs to be fitted higher up in the brickwork where a C100 cannot be used. The trim is usually fitted into a bed joint of the brickwork or a 25mm deep slot cut out with an angle grinder fitted with a mortar chase disc. Apply Topseal trim adhesive to the back of the trim at 300mm centres. Fit the trim into the slot and press firmly back to the wall. Apply a clear silicone sealant along the length of the C200 into the slot to seal it into the wall.

C100\C100MT- Simulated lead flashing



Application instructions

The C100 is a simulated lead flashing, generally fitted in conjunction with D250 angle fillet trim. The C100MT is a simulated lead flashing with an integral, self-secuting moisture trap. C100\MT is usually fitted into a bed joint of the brickwork or a 25mm deep slot cut out with an angle grinder fitted with a mortar chase disc. Apply Topseal trim adhesive to the back of the trim at 300mm centres. Fit the trim into the slot and press firmly back to the wall. Apply a clear silicone sealant along the length of the C100\MT into the slot.



C100 typical application

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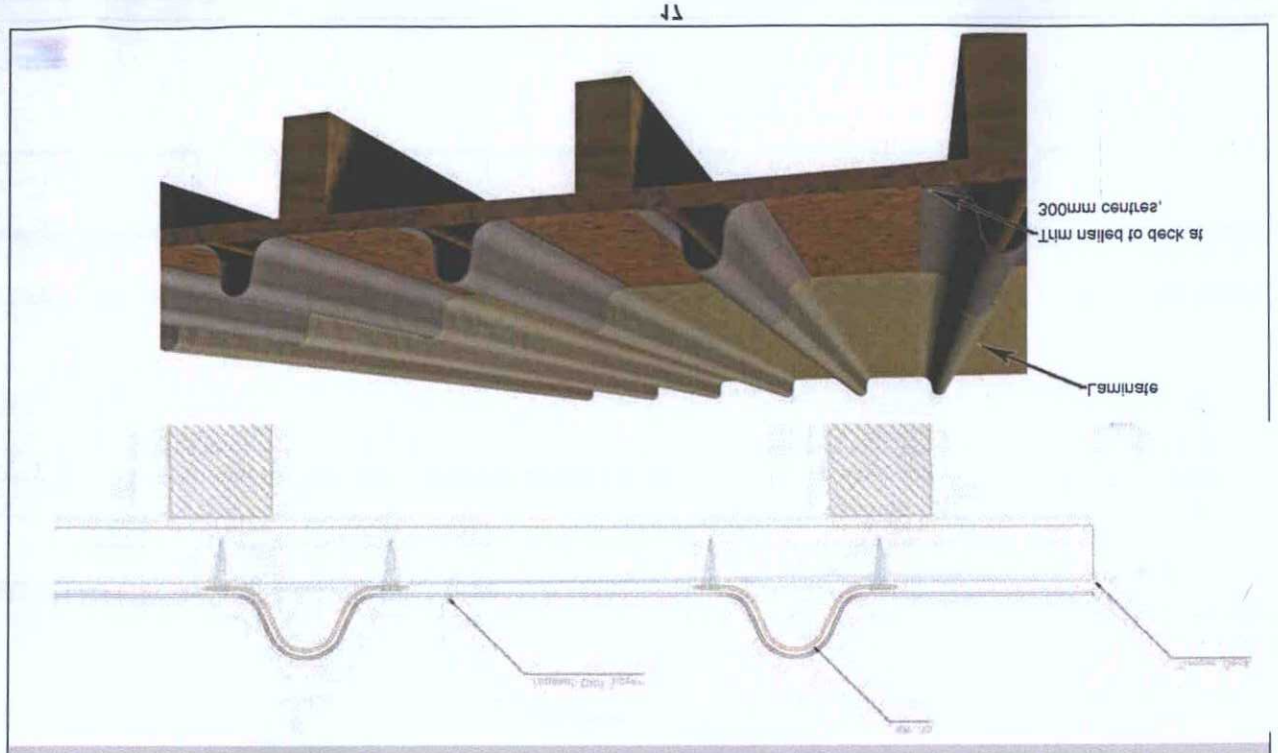
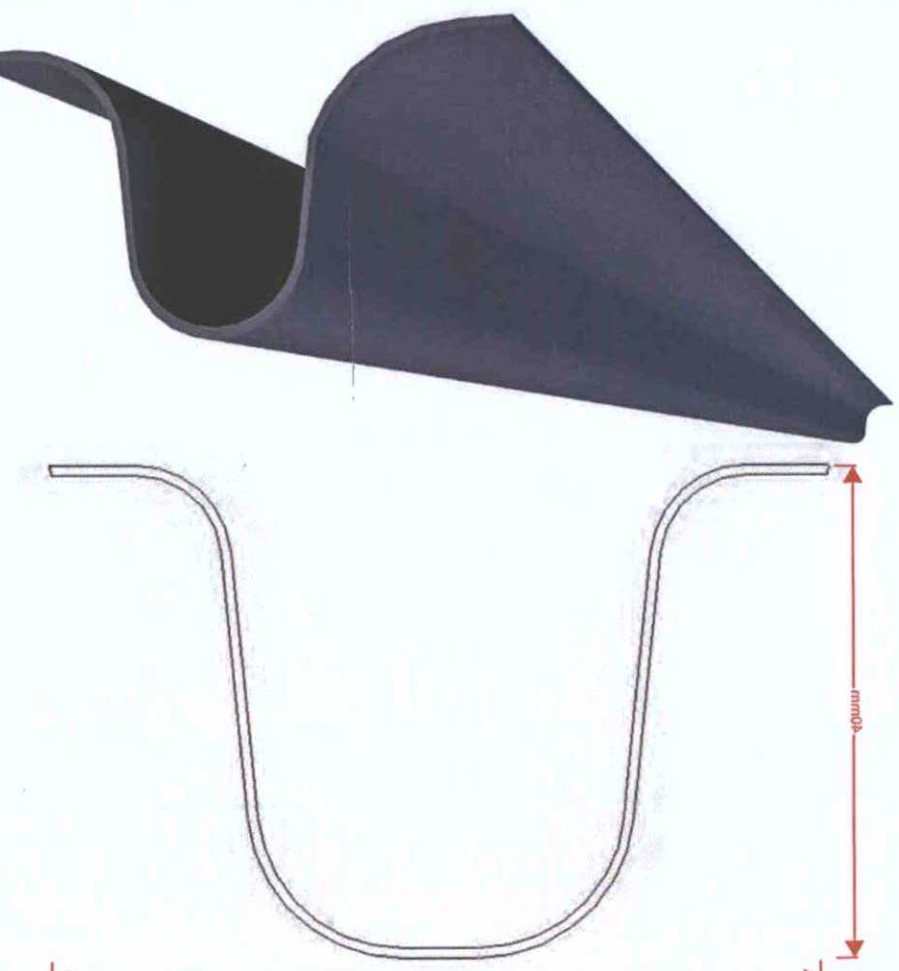
Technical information

E35- Simulated rolled lead joint



E35 typical application

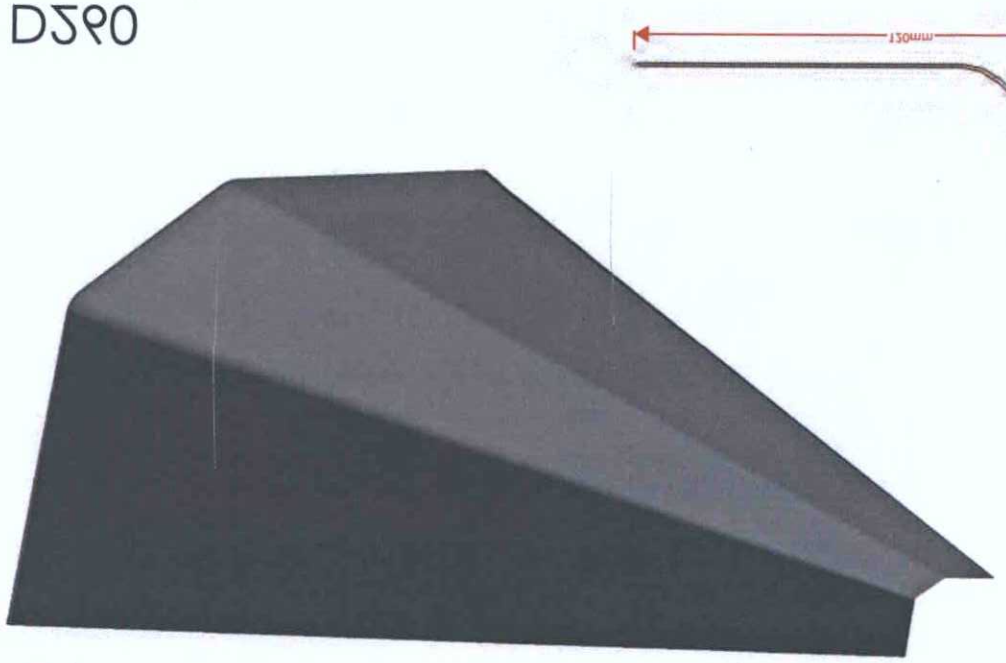


E35

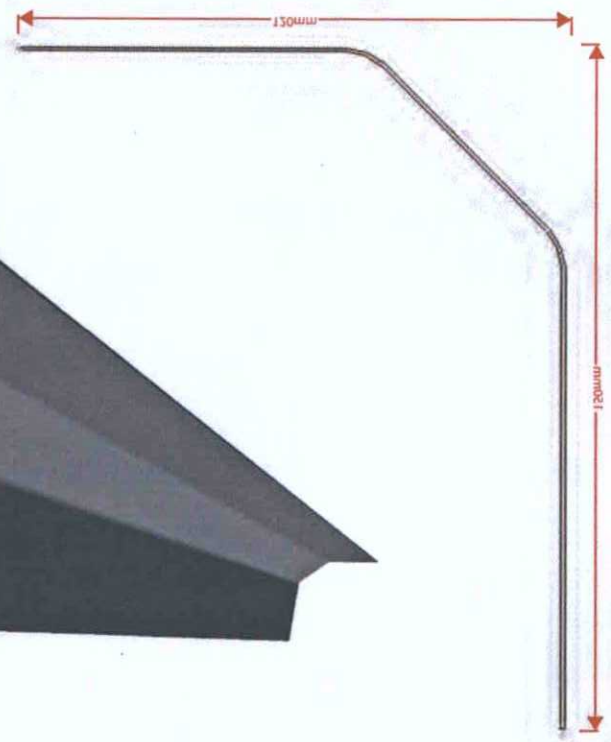
Application instructions

Used to simulate the appearance of raised rolled lead joints, also provides expansion. The trim should be nailed to the deck at 300mm centres. The joins and nail penetrations should be bandaged before the laminate is laid over the top of the trim. Ensure that the laminate is well consolidated over the top of the trim.

D250- Wall fillet

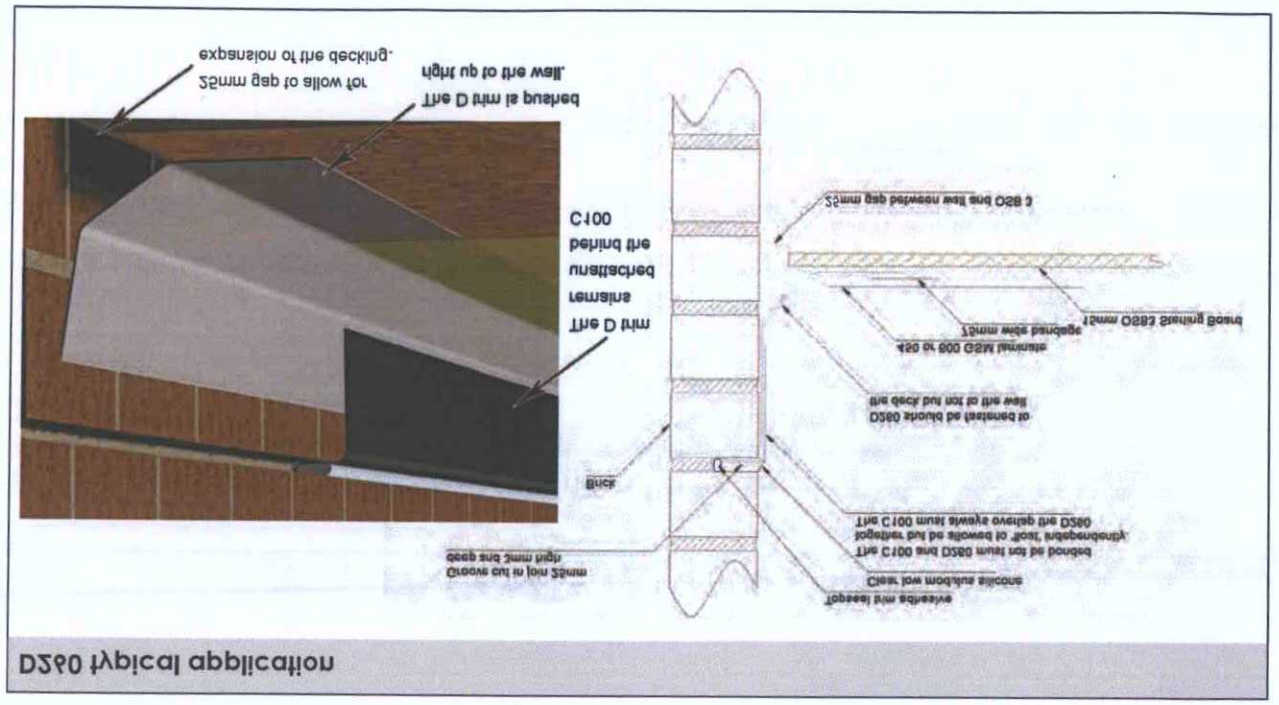


D250



Application instructions

The D250 is an angle fillet trim, fitted where the roof abuts a wall or vertical face, against parapet walls, in box gutters etc. It is compatible with C2 and C3 universal corners. An angle fillet generally does not require a batten or to be bonded with trim adhesive. Place the trim against the vertical face and push down diagonally into the corner until the trim fits snugly. Where the trims are over-lapped they should be bonded with trim adhesive and bandaged together.



D250 typical application

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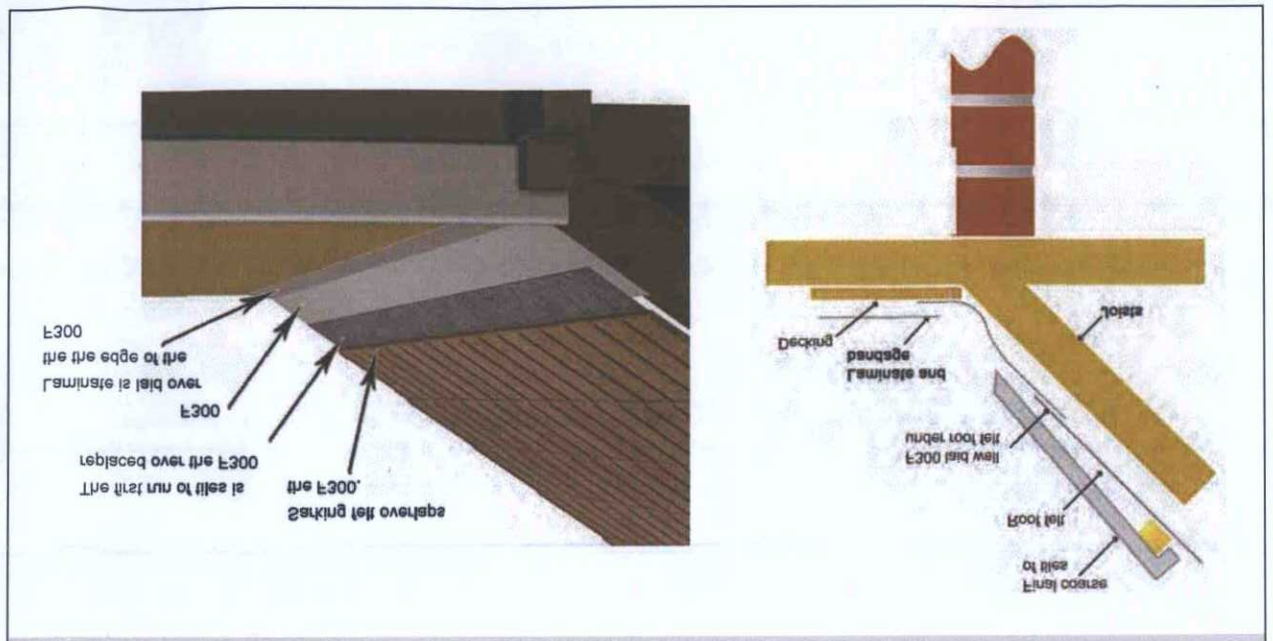
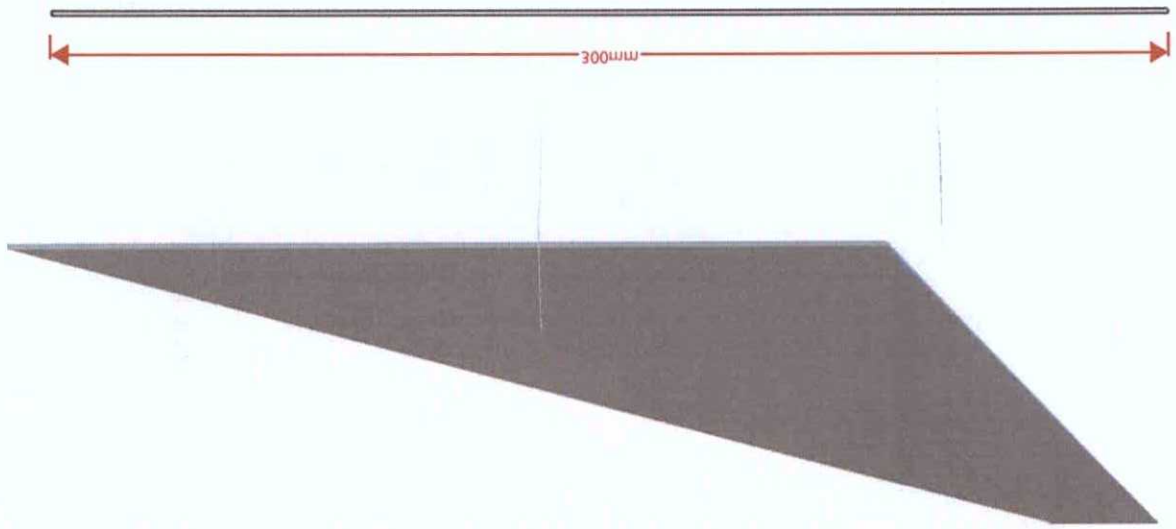
F300- Flat flashing



F300 typical application

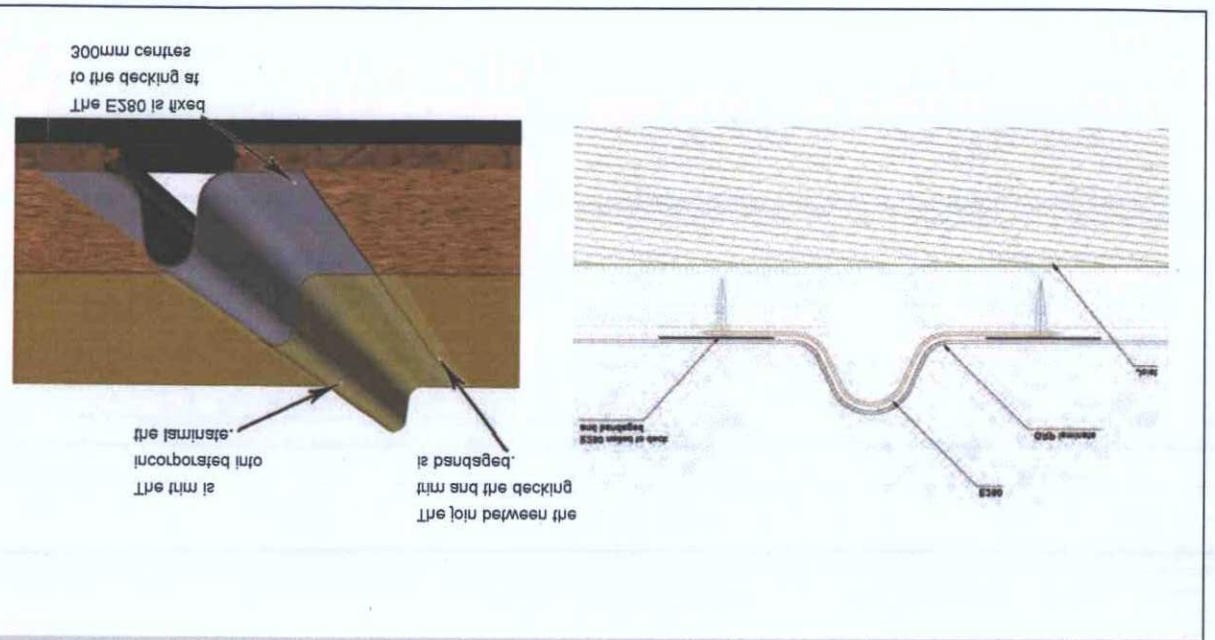
F300



Application instructions

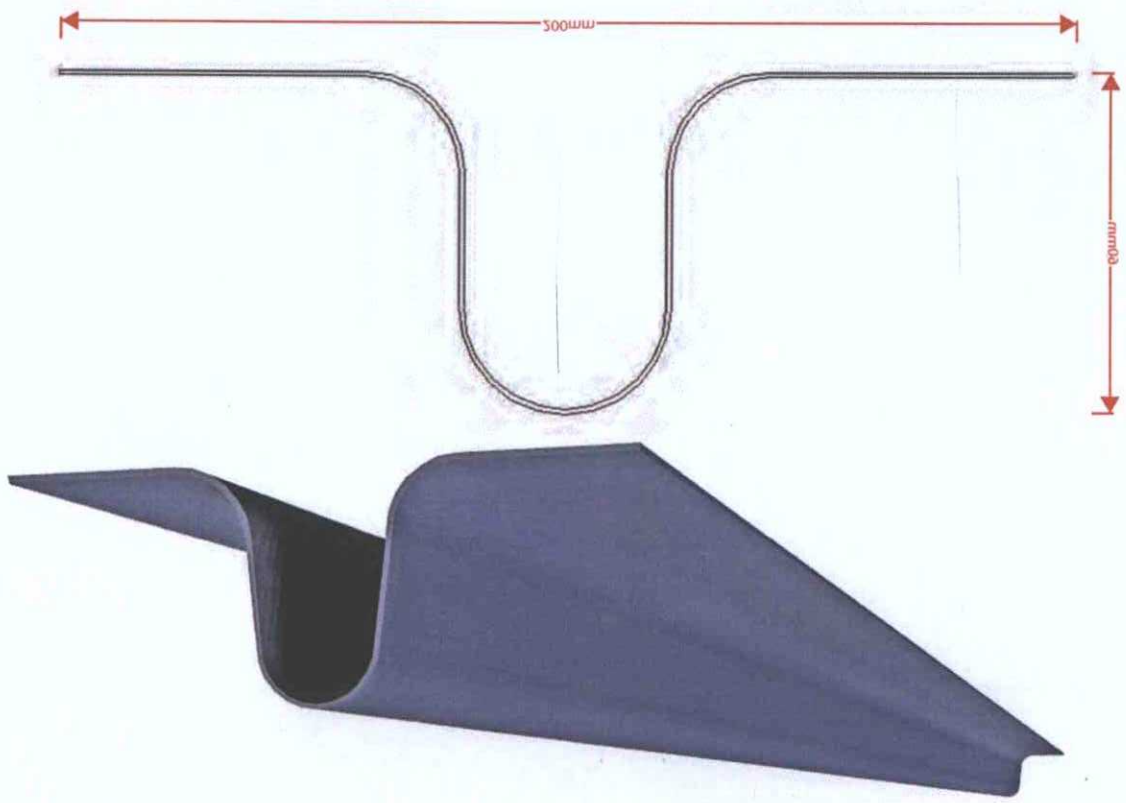
The F300 is a flat flashing, mainly used at the intersection of a pitched roof and flat roof often found on dormers. F300 should always be used for this situation and it should NOT be laminated as this will be a weak point and it will crack. It is nailed or stapled to the deck and bent up the roof slope. In this situation, the F300 also acts as an expansion facility and must only be fixed along the bottom edge. There are many other applications for F300 including vertical details where laminating would be time consuming, under the feet of air conditioning units to enable re-roofing without disconnecting, some parapet wall details etc. The F300 can be bent to adapt it to most applications which require a flexible flat sheeting. The trim should be nailed to the deck around its edges and bandaged over any joins or nail penetrations. Any unlaminated trim can be topcoated with the rest of the roof.

F280- Raised ridge roll



E280 typical application

E280



Application instructions

E280 is used both to create expansion joints on large roofs (over 50m²) and create rolls on any ridge details. It is compatible with C5 closures. An adequate gap in the deck should be cut if necessary, the trim should then be nailed to each end of the decking at 300mm centres. The join over the nails should then be bandaged and the laminate should be applied over the trim. To bond these trims together, or to cap with C5 closures, apply a thin strip of PU adhesive to the inside edge of the overlapping trim and rub into place.

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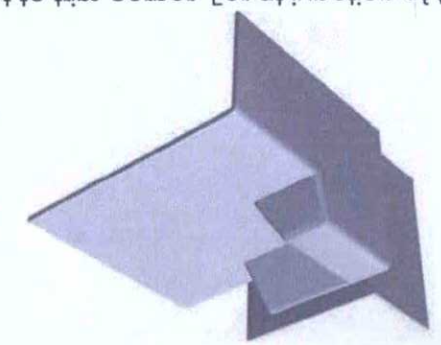
C1,2,3,4,5,6 -Corners and closures

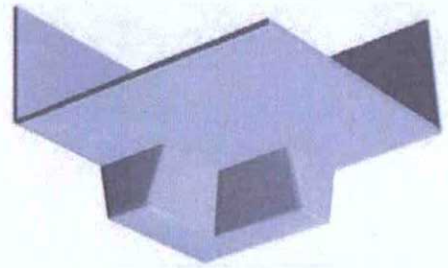
Application instructions- Corners

Application is the same for all the corner trims listed below. The corner should be nailed through the overlapping trim to the deck at each end and in the middle. The joins between the trim and the corner should be sealed with a thin line of Topseal trim adhesive, a moist finger can be used to wipe the adhesive, ensuring it seals the entire joint. The joint is then bandaged over. Tissue should be used to ensure a smooth finish.

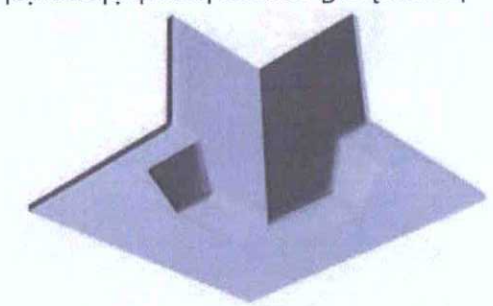
Corner trim range



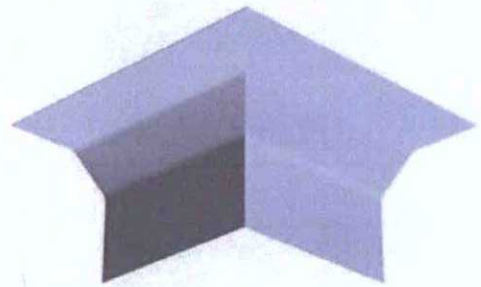
C2 Fillet to trim corner- For at junction of flat roof and abutting wall. Compatible with A200, B250 & D250.



C1 Universal external corner- Compatible with A200 and B250 when used on an adjoining edge.



C4 Universal internal corner- Pre-formed internal left and right hand corners . Compatible with A200 & B250.

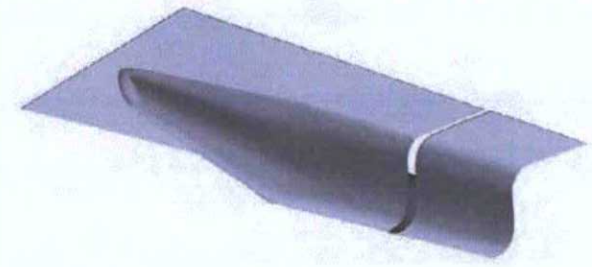


C3 Internal/External fillet corner- Preformed internal/external corner for use with D250. Avoids mitring in situe.

Application instructions- Closures

Application is the same for all the closure trims listed below. Apply a thin line of Topseal trim adhesive to the end of the rolled trim and over lap the closure by at least 50mm and press the trims together firmly to ensure that the adhesive seals the gap nail the trim to the decking and laminate over the completed section.

Corner trim range



C5 rolled rib closure- Compatible with E35 simulated lead roll trims.

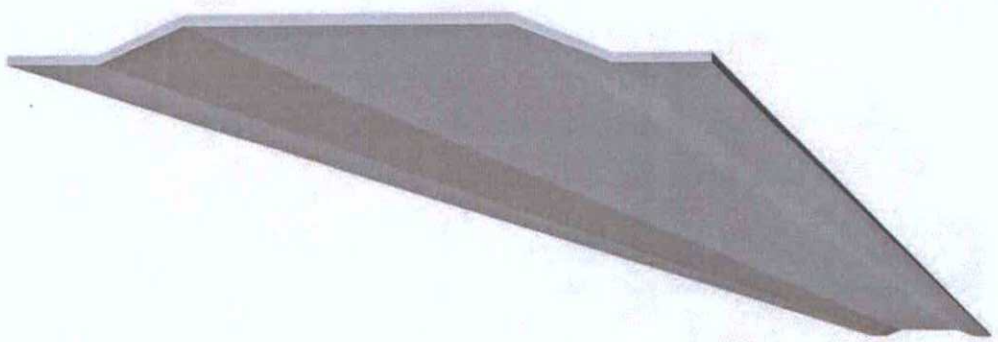


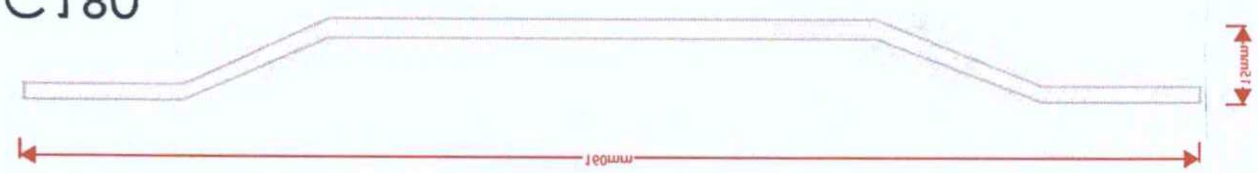
C6 roof ridge closure- Compatible wth E280 expansion joint/ridge trims

C180- Expansion joint

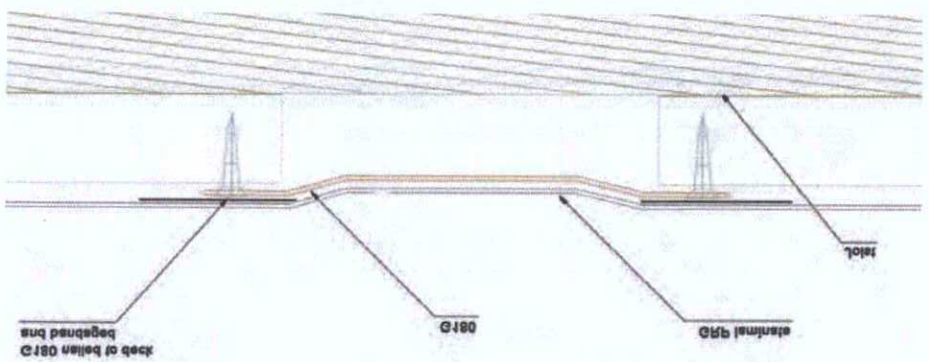
Application instructions

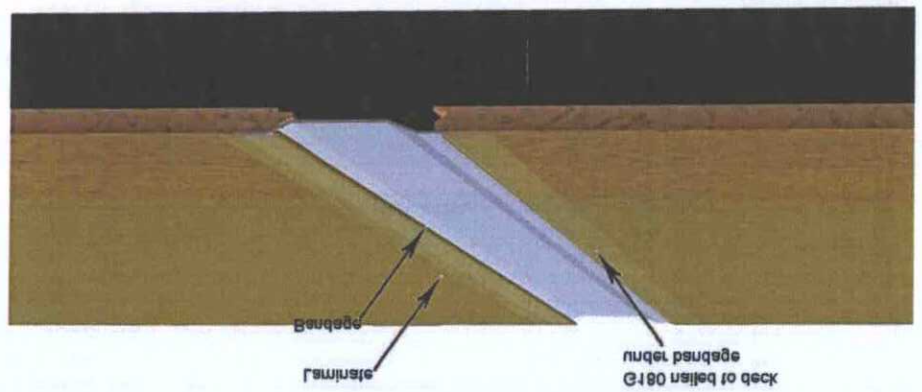
C180 is used to allow for expansion on large roofs (over 50m²) it also acts as an integral gutter to aid drainage. The decking should be cut to allow for an adequate gap in which to insert the trim. the flanges of the trim should be parallel with the decking. The trim should then be nailed to the decking. The joins between where the trim edges are nailed and the decking should then be bandaged and the laminate should be applied over the trim.





C180 typical application





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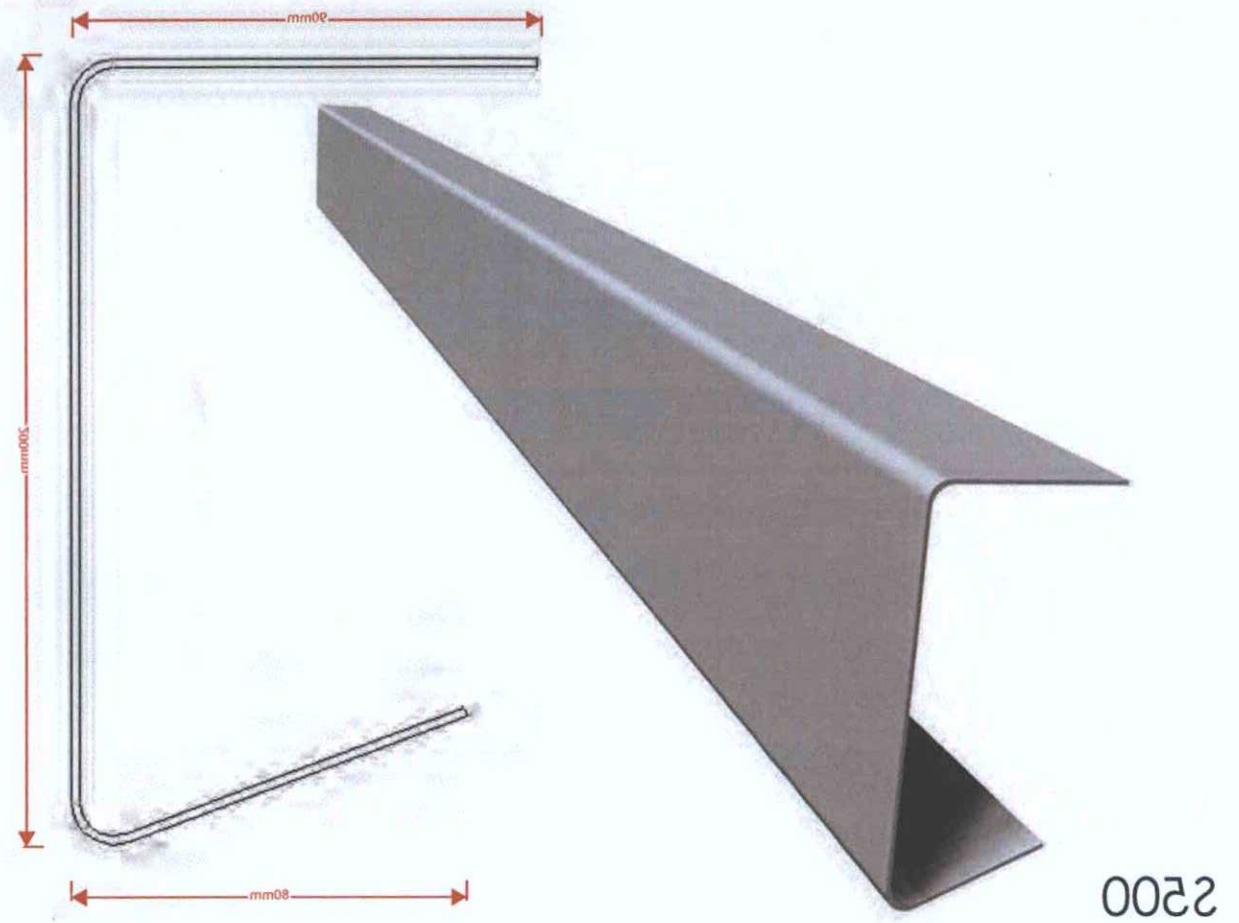
S500- Soffit trim

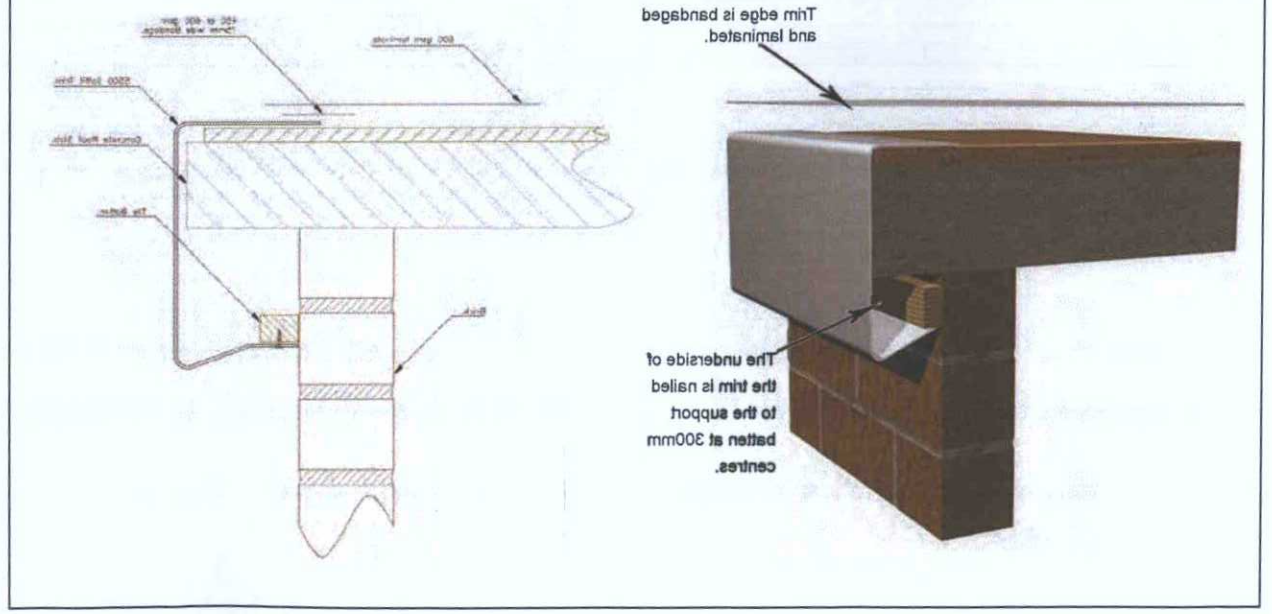
Application instructions

Used as a fascia trim for concrete roofing or any similar application which requires an over-sized soffit trim. A support batten should be attached to the wall beneath the structure. The trim should be nailed to the decking at 300mm centres and then the underside should be nailed to the batten. The join between where the nails penetrate the trim and the decking should be bandaged over, the laminate can then be applied to the roof and should over lap the edge of the bandage. The laminate should not extend onto the fascia of the trim.



S500

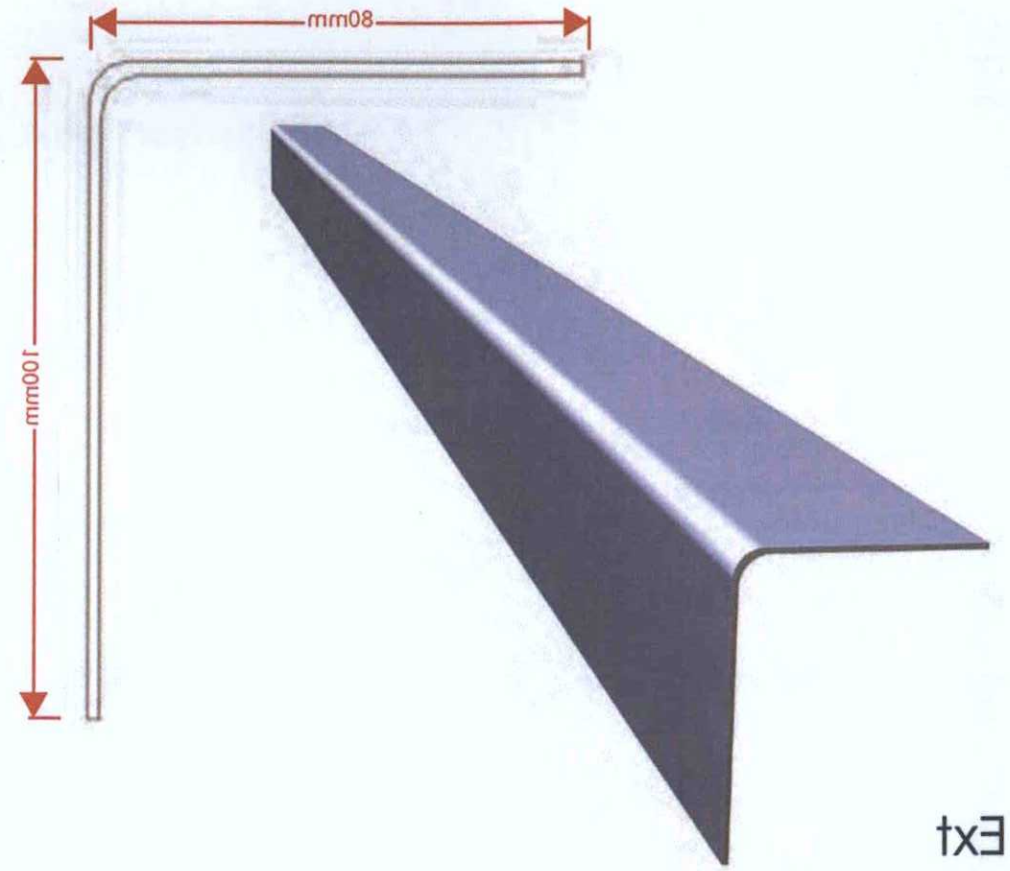
S500 typical application



AT 195 External angle trim

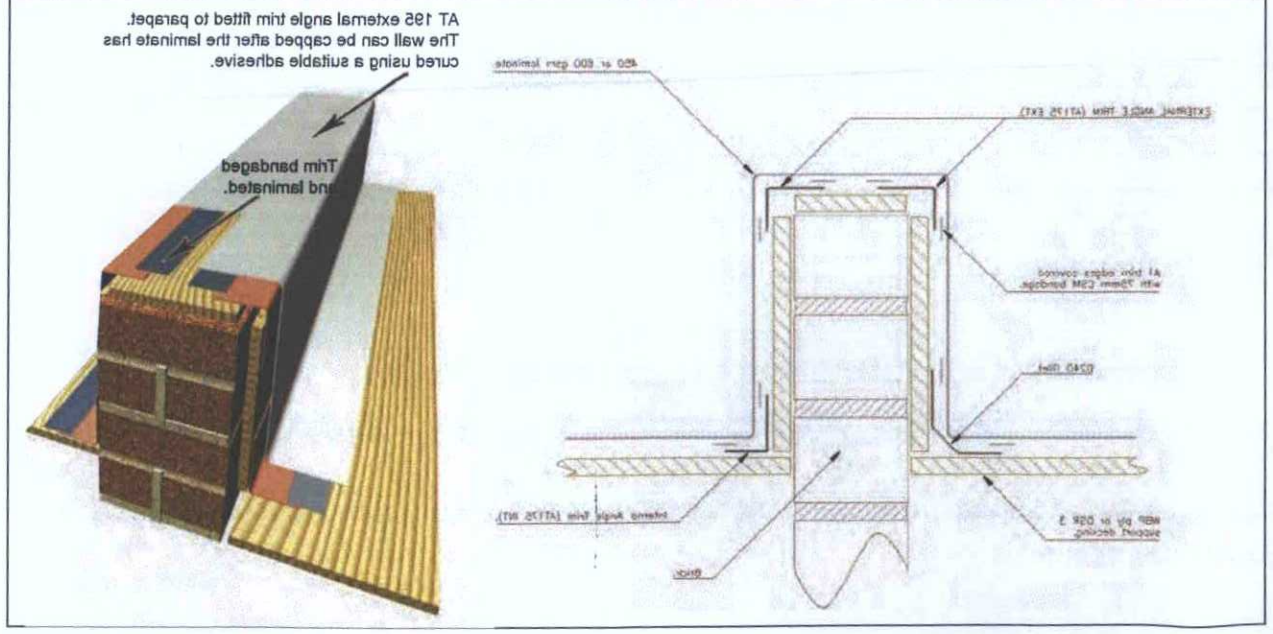
Application instructions

The AT195 external trim is used wherever the Topseal laminate needs to cover a surface which needs to continue perpendicular to the current level. The trim is supplied with a high adhesion finish on its outer fascia. The trim should be nailed at both edges if possible. Always bandage over the join between where the nails penetrate the trim and the decking before applying the laminate.



AT 195 Ext

AT195 Ext typical application



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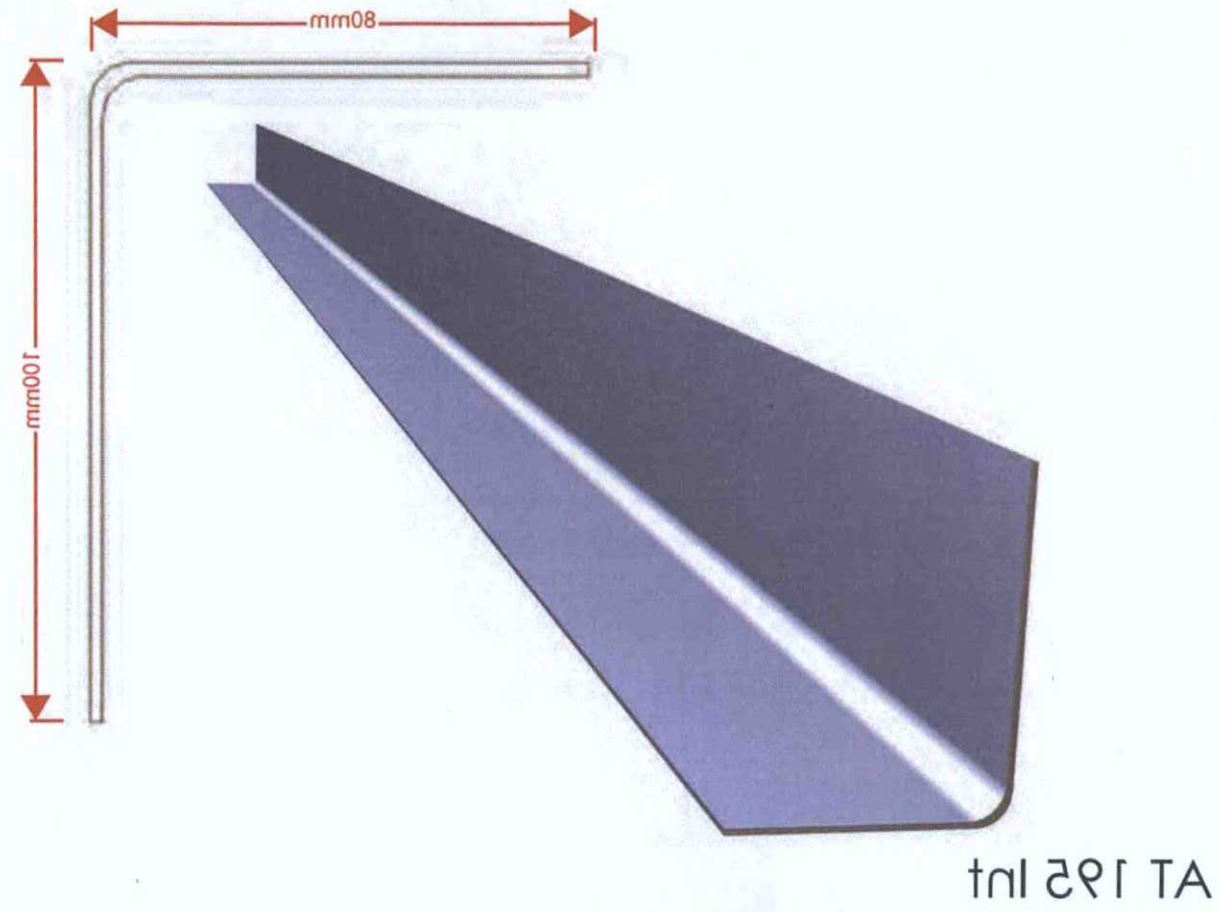
AT 195 Internal angle trim

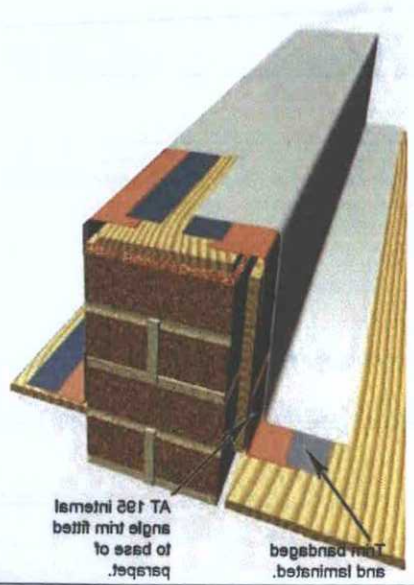
Application instructions

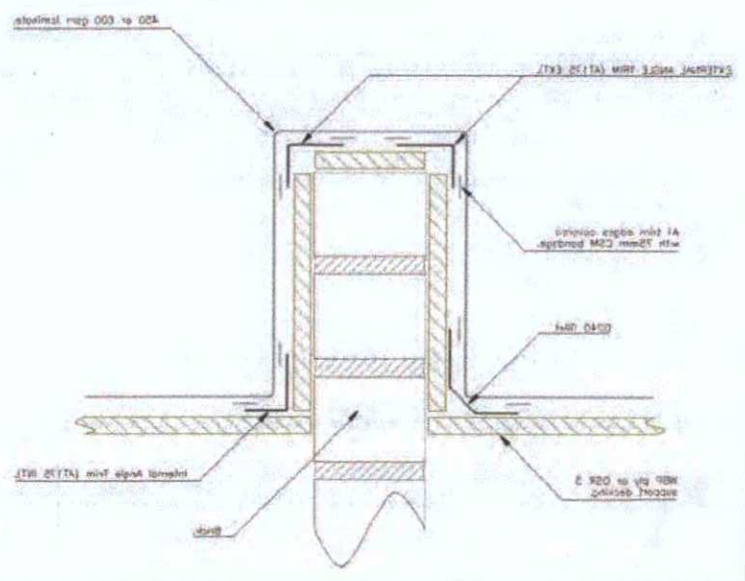
The AT195 external trim is used wherever the Topseal laminate needs to cover a surface which needs to continue perpendicular to the current level. The trim is supplied with a high adhesion finish on its outer face. The trim should be rolled at both edges if possible. Always bandage over the join between where the nails penetrate the trim and the decking before applying the laminate.



AT 195 Int

AT195 Int typical application

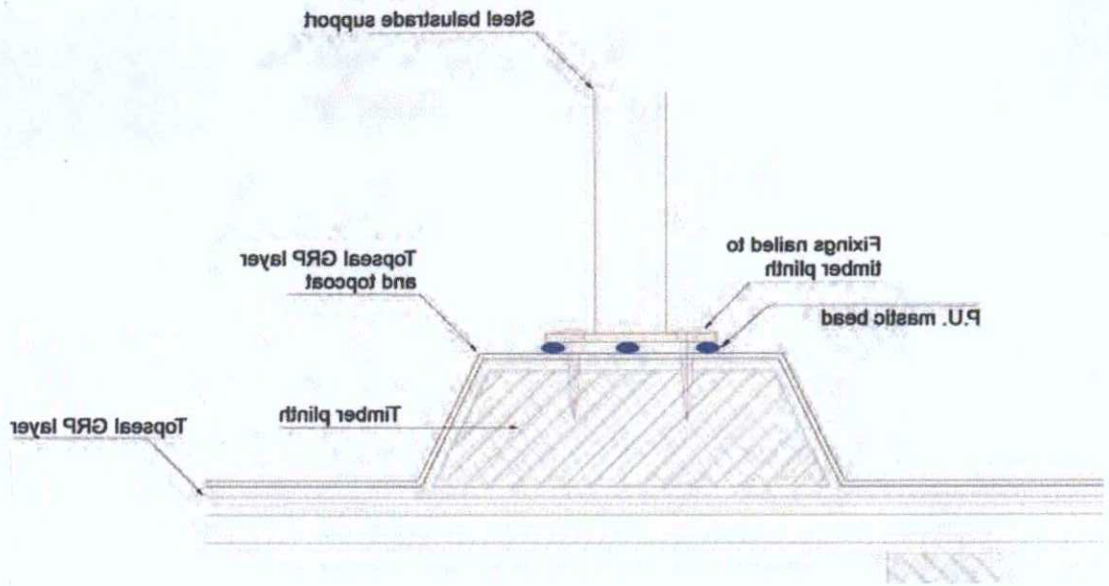




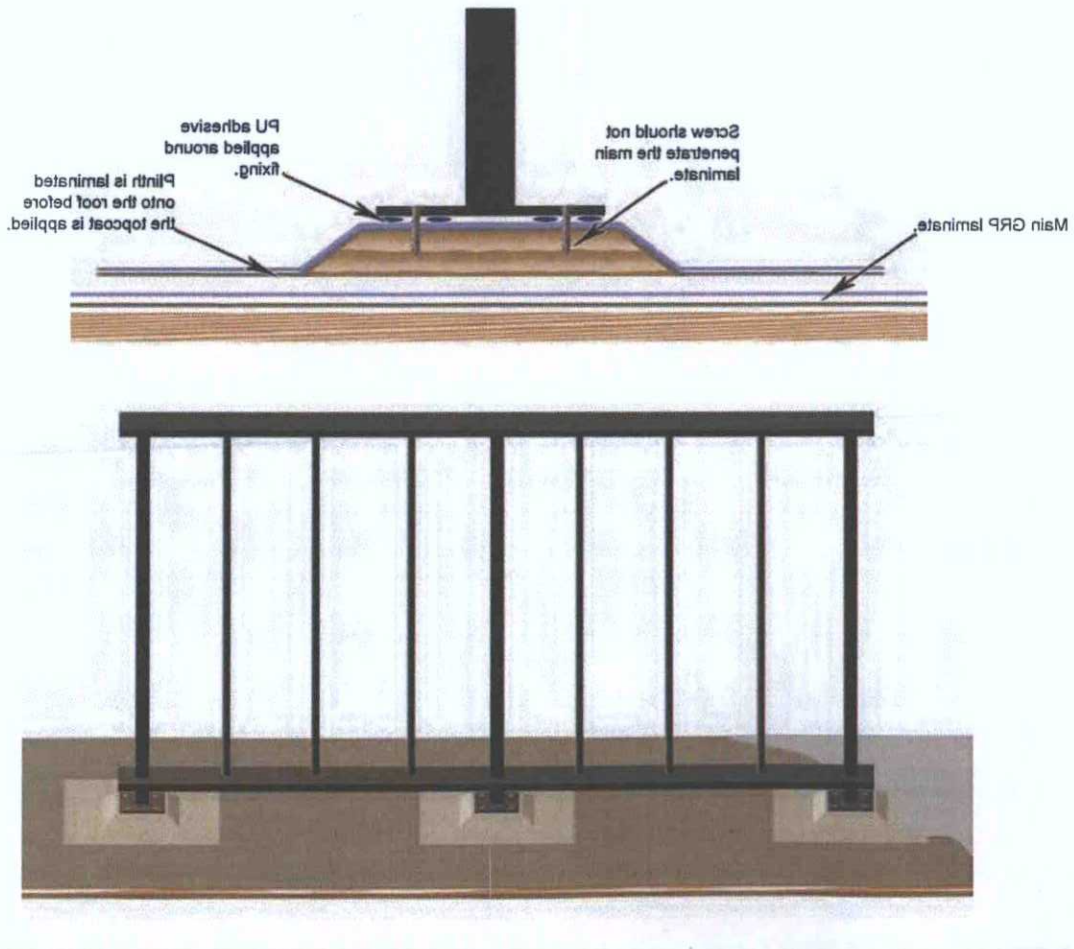
Balustrade support fixing

Application instructions

Balustrade support fixings can be installed onto a completed Topseal laminate after it has cured. The timber plinth is laminated to the substrate and then topcoated. The balustrade is then screwed into the plinth and the whole area around the screws are completely sealed with PU adhesive. Always ensure the roof area on which the fixing will be laminated is clean, dry and free from debris, wiping the surface down with acetone will help to remove any contaminants present in the laminate. It may help to clean and abrade the surface with medium grade sand paper before wiping with acetone to increase the inter laminar adhesion.



Marsard support typical application



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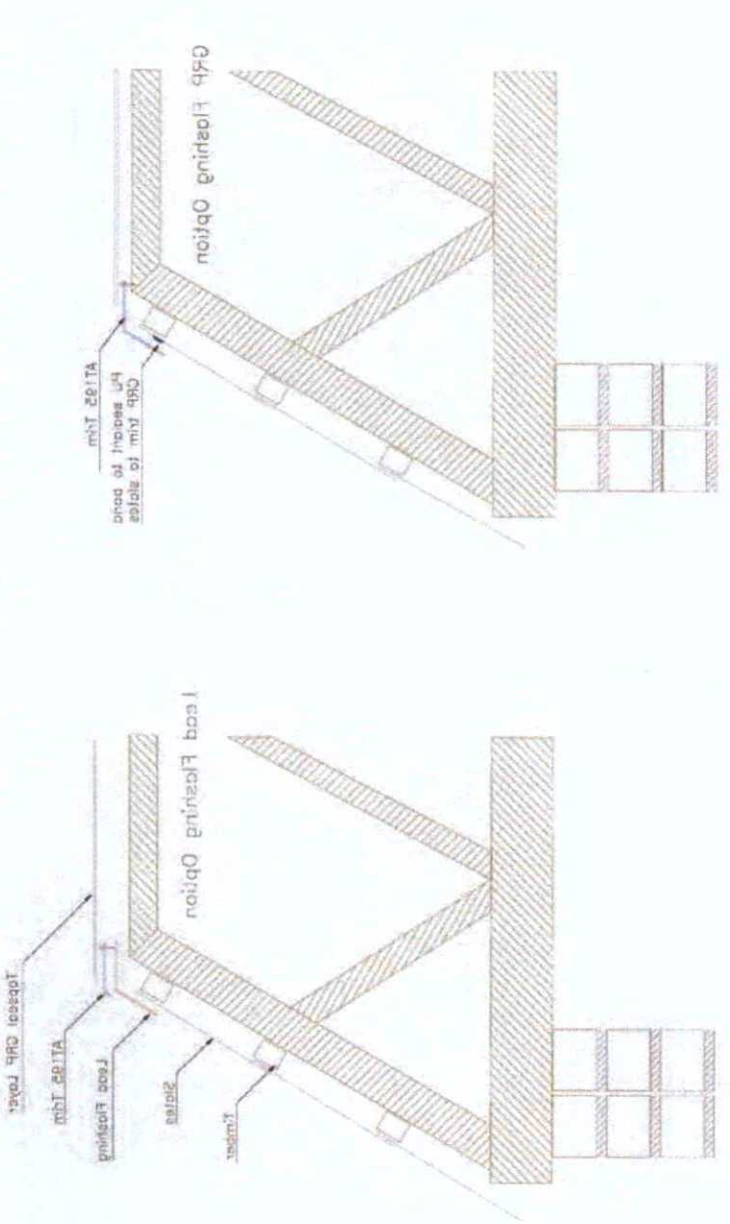
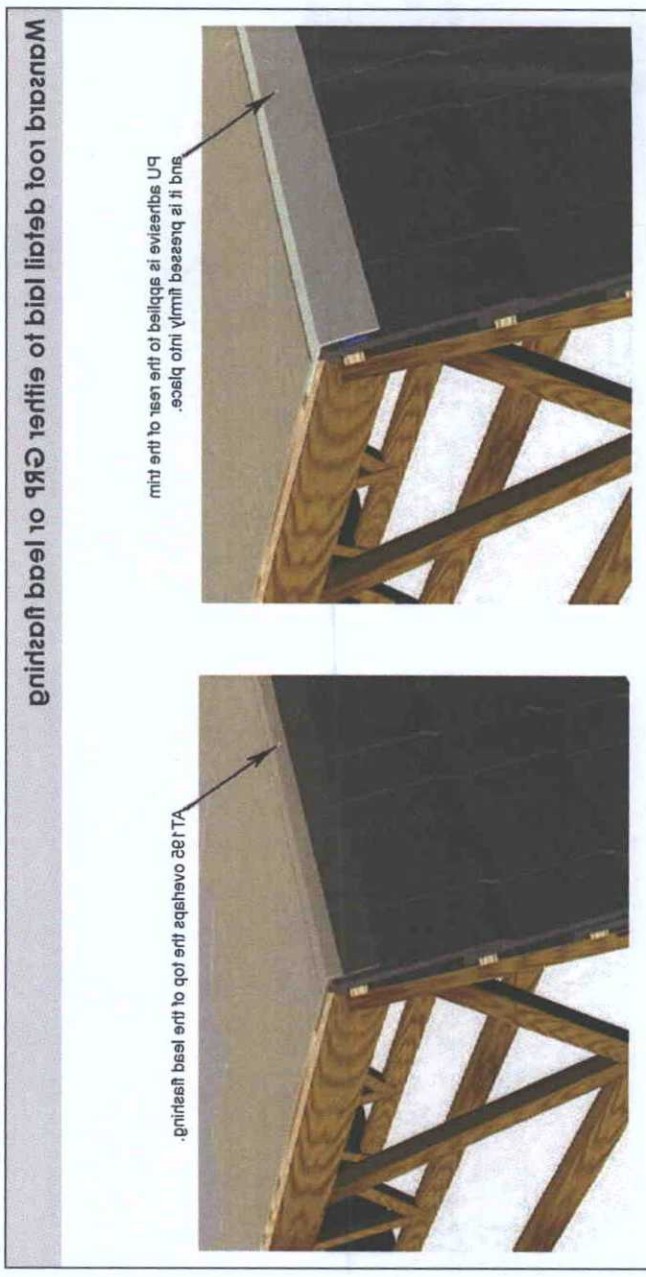
Mansard roof detail

Application instructions

A Topseal roof can be laid up to a Mansard roof detail with either GRP or lead flashing. The flashing should be prepared while the other GRP trims are being fixed to the roof. If the roof is laid to a GRP flashing (an AT195 external angle trim) a thin strip of PU should be applied to the underside of the trim before it is firmly pressed into place. The trim should then be secured by clout nails fixed at 300mm centres along the edge. If the roof is laid to a lead flashing, a cut down AT195 external angle trim should be secured at 300mm centres to the perimeter of the roof so it overlaps the top edge of the flashing. the roof can then be laminated onto the top face of the trim.



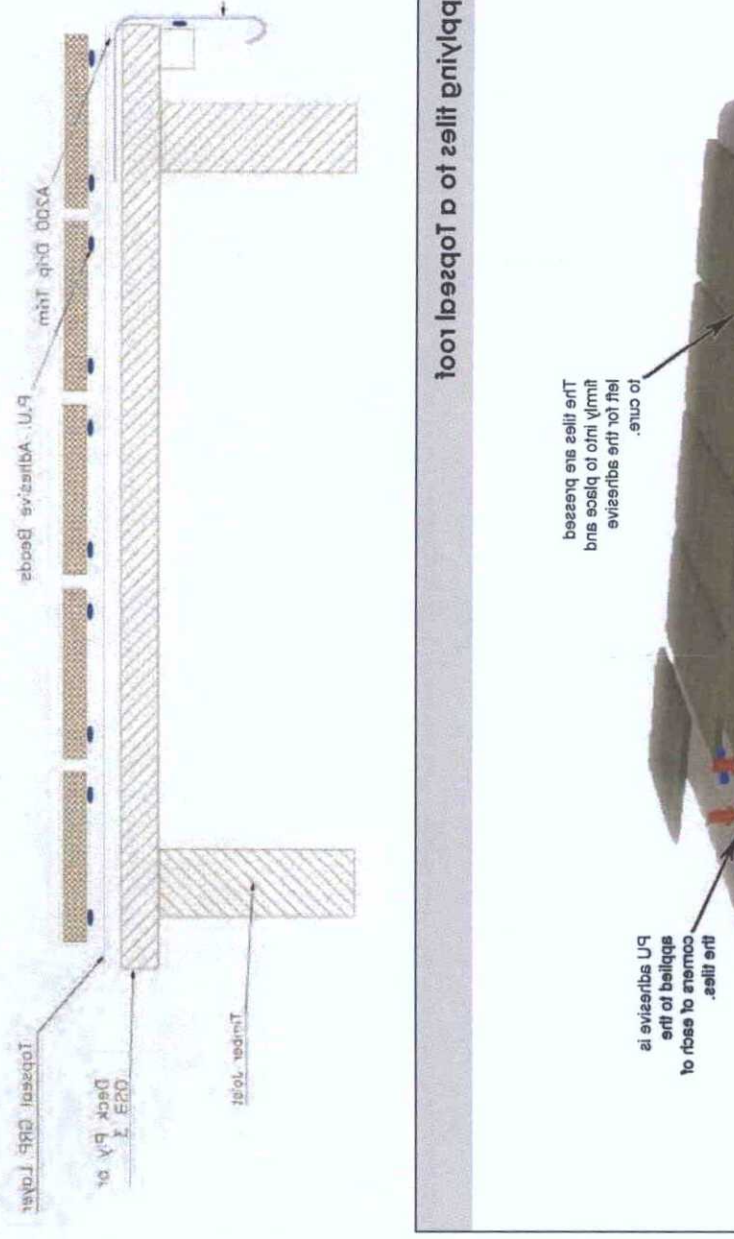
Mansard roof detail laid to either GRP or lead flashing



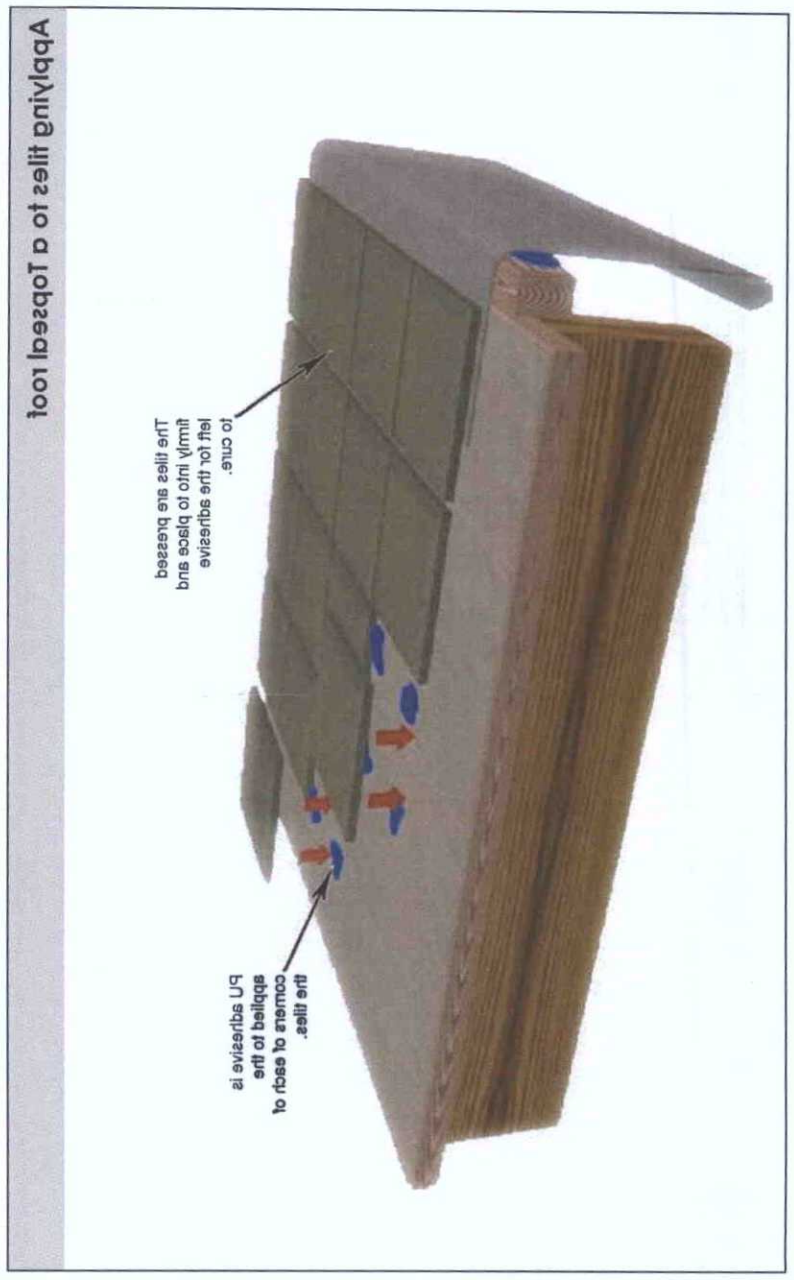
Mansard roof detail

Application instructions

Tiles can be applied onto a Topseal roof after it has cured. Ideally the tiles should be laid as soon as the roof has completely cured. Any dirt or debris should be removed from the roof and it it has been left for an extended period of time it should also be washed down with acetone before the tiles are applied. The tiles can be applied directly to the roof using either a suitable PU adhesive/sealant or a polyester bonding paste. Do not use a tile cement or any cementatious product.



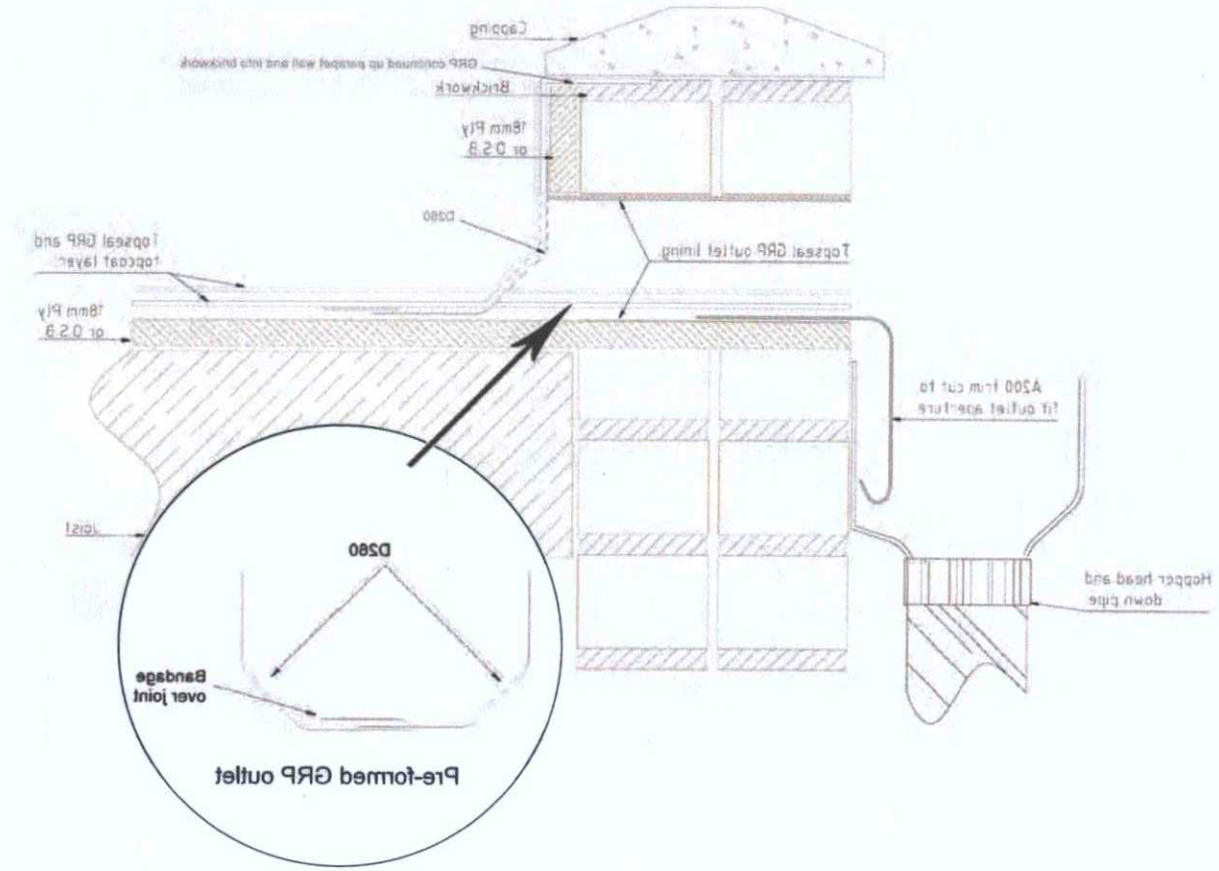
Applying tiles to a Topseal roof



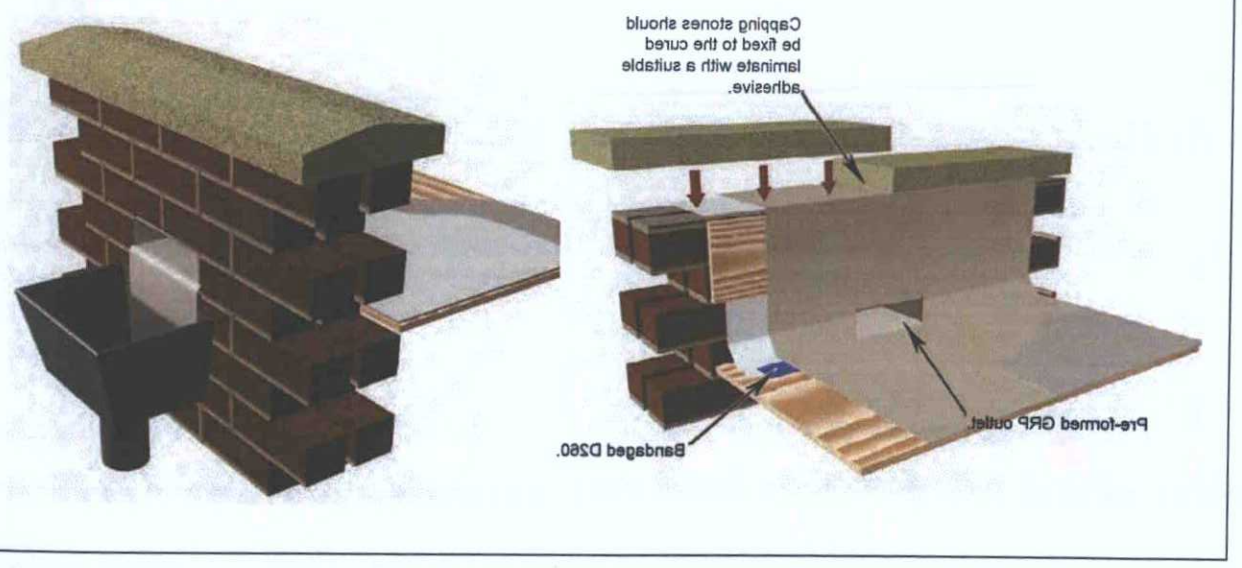
Outlet through parapet wall

Application instructions

The pre-formed GRP outlet lining should be constructed as the trims are fixed to the roof. Two D2605 can be joined together using a piece of laminated bandage to seal the joint after the trims have been fixed securely to the decking using clout nails. An A type drip trim should be used to allow water to flow into the gutter. The decking should be rebated by 2mm to allow the A trim to sit level with the roof and prevent water from ponding in the outlet.



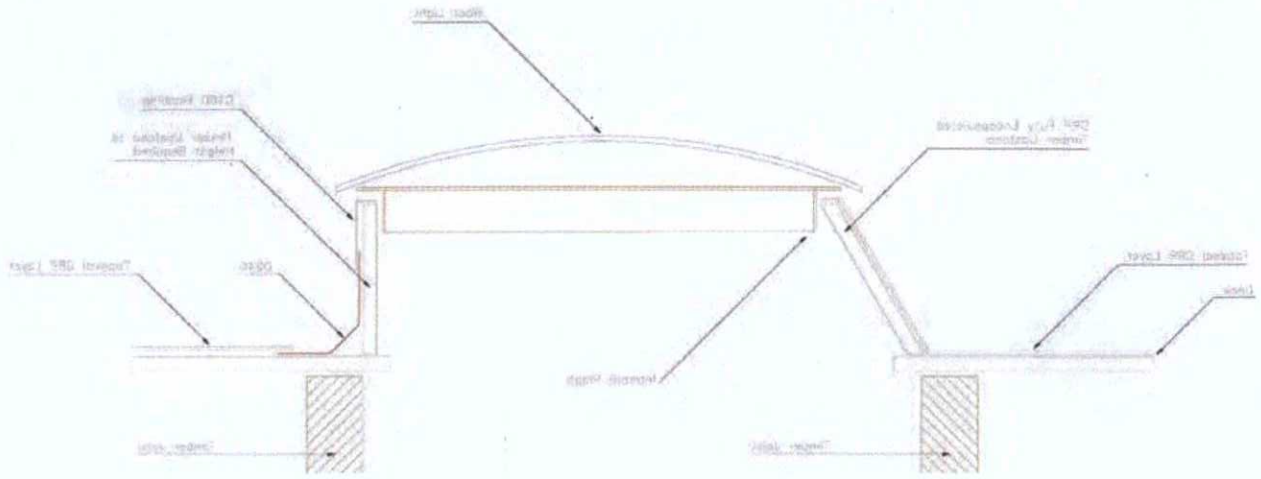
Outlet through parapet.



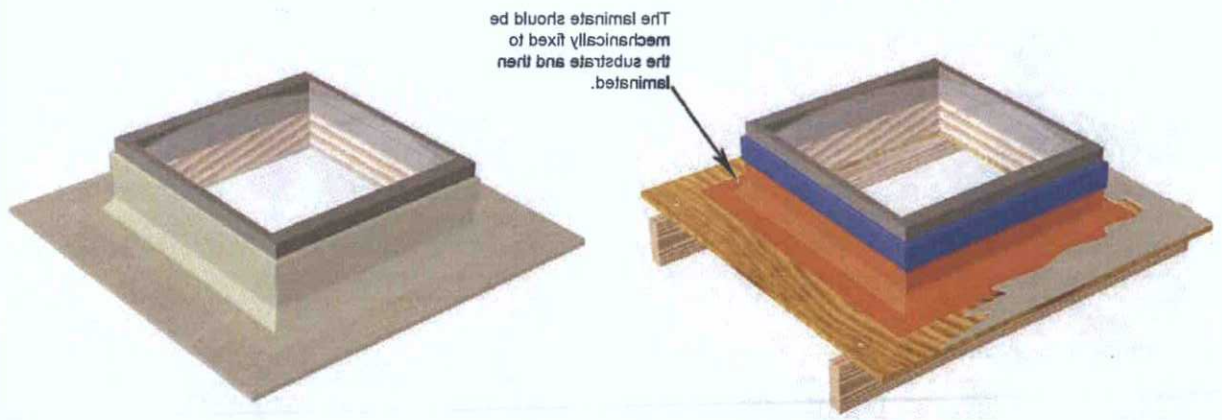
Rooflight Installation

Application instructions

Pre-formed skylight units can be easily incorporated into a Topseal roof. As a general rule, the skylight should be fixed to the structure the roof is to be laid onto by either rolling or some other mechanical form of fixing. The flanges of the frame should then be bandaged over where it is attached to the structure. The laminate should be laid up to the edge of the skylight. If the skylight requires a frame to be constructed, this should be also be incorporated into a structure.



Outlet through parapet.



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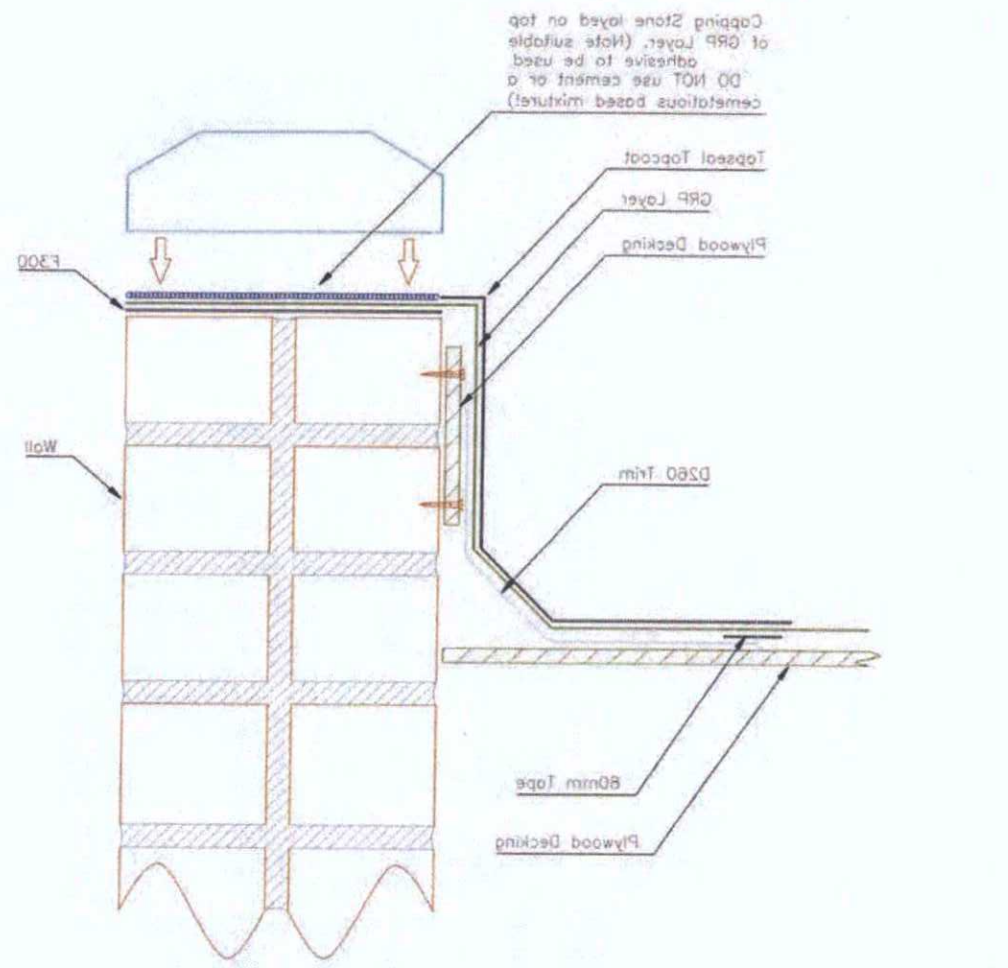
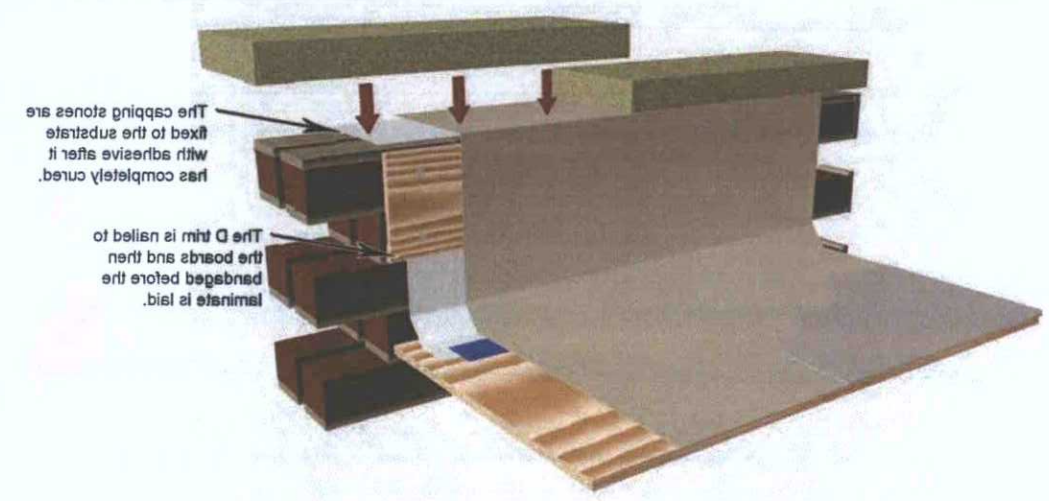
Parapet wall (laid under capping stone)

Application instructions

A parapet wall should usually be incorporated into the roof to prevent any porosity arising from any tailings in the wall. The wall can either be covered completely, or it can be dressed into the wall and capping stones can be fixed on after the roof has cured. In this case, the roof is laid under the dapping stone. F300 should be mechanically fixed to the wall and sealed around the perimeter with PU adhesive. The roof can then be laid on top. A suitable non-cementatious adhesive can then be used to fix the stone on top of the wall.



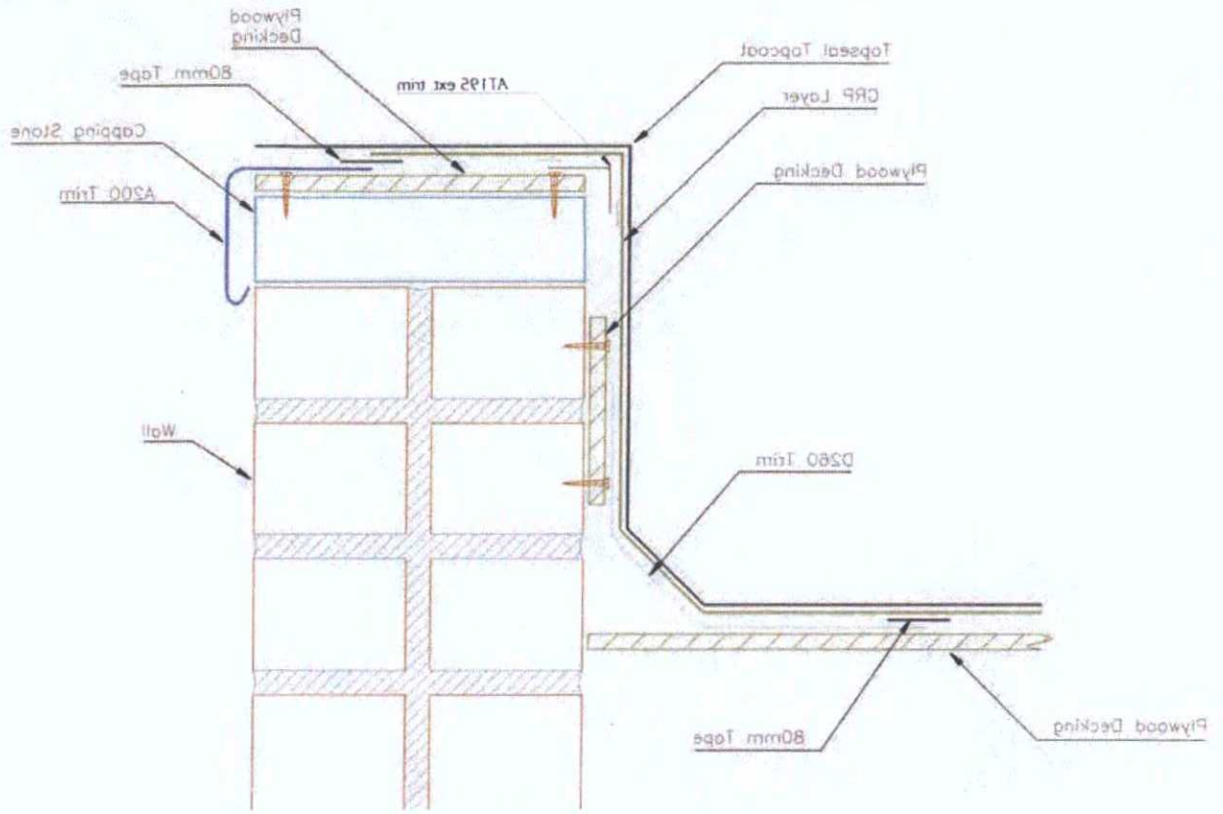
Parapet wall (laid under capping stone.)



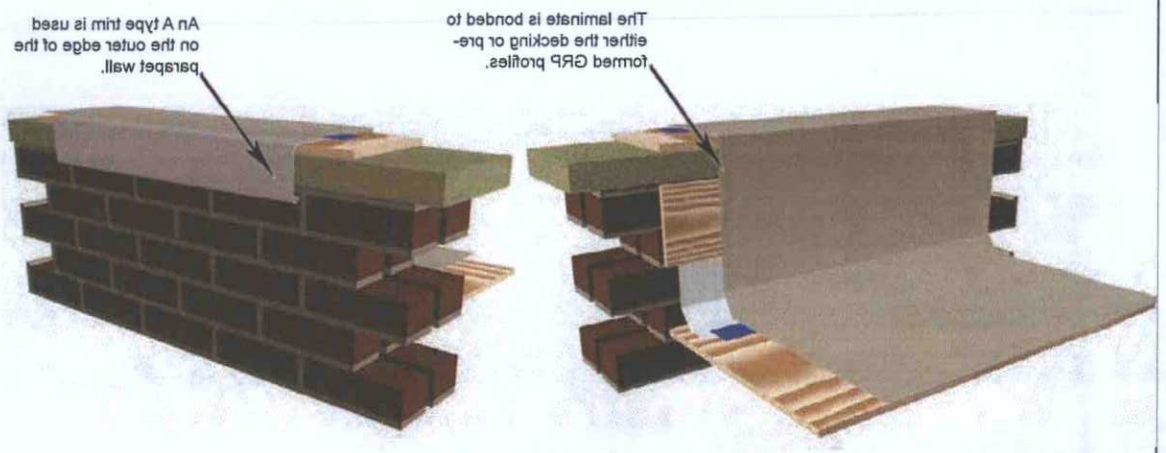
Parapet wall (laid over capping stone.)

Application instructions

A parapet wall should usually be incorporated into the roof to prevent any porosity arising from any tailings in the wall. The wall can either be covered completely, or it can be dressed into the wall and capping stones can be fixed on after the roof has cured. In this case, the roof is laid over the dapping stone. The trims used are all nailed to the decking and bandaged before the laminate is laid over the top.



Parapet wall (laid under capping stone.)



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Technical information

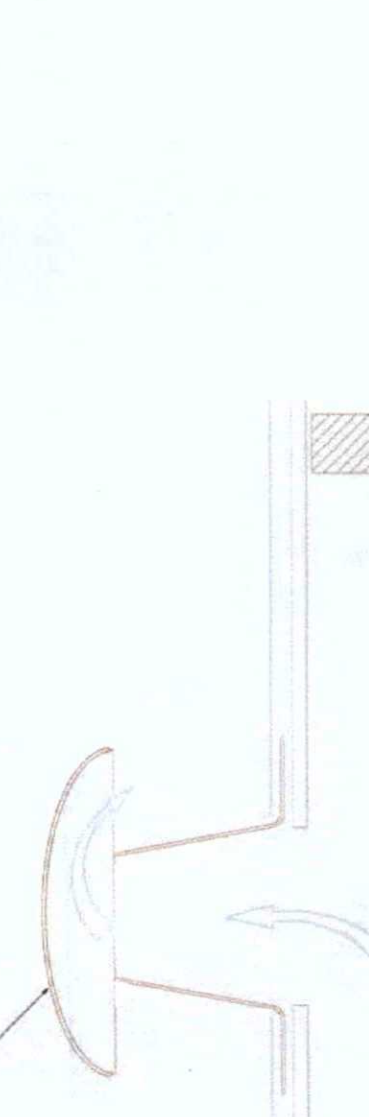
Technical information

Pre-formed PVC pipe outlet

Application instructions

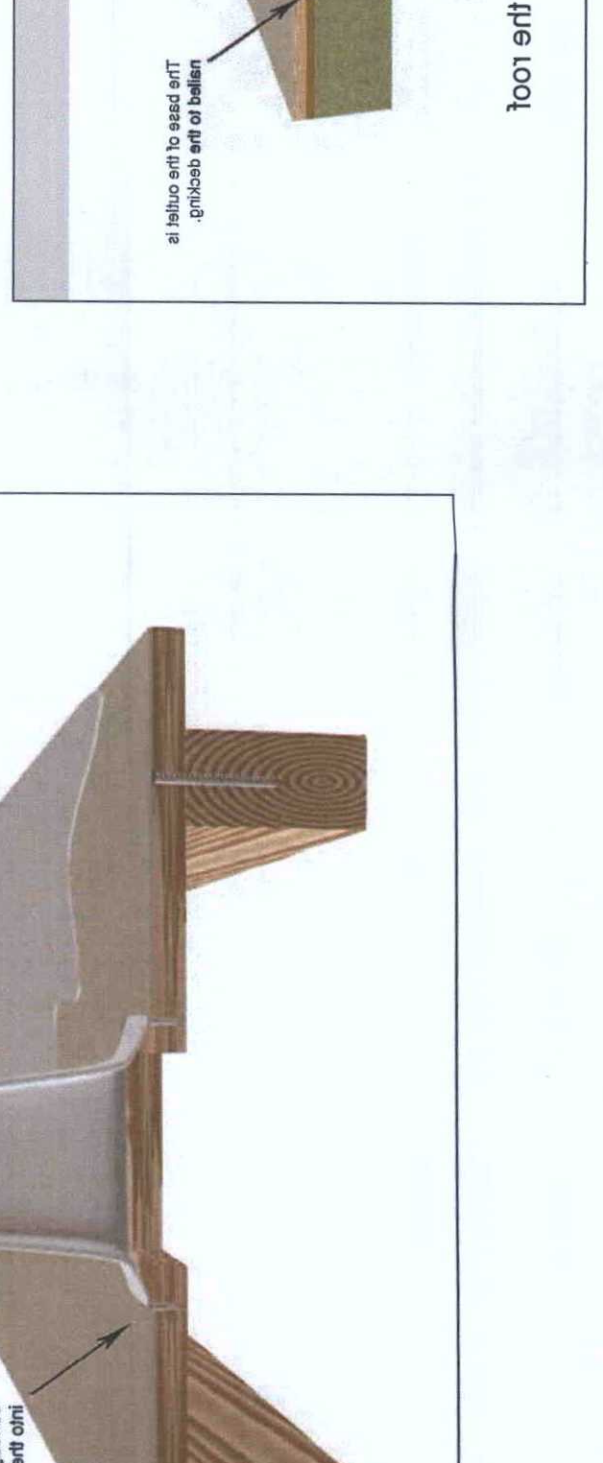
The outlet should be constructed before the roof is laid. Place a suitable PVC pipe of a polished street bends and apply a bead of PU adhesive around the outside of the pipe. Lay the laminate up around the outside of the pipe and ensure it is thoroughly consolidated into the PU and sealed around the pipe. Apply enough laminate around the bottom of the pipe to form a base that can later be nailed to the deck. The pipe can be fitted in place when the remaining trims are fitted to the roof. The outlet should be nailed to the decking around its perimeter and incorporated into the laminate.

Forming the outlet



Fitting the outlet into the roof





Roof Ventilator

Application instructions

A pre-formed roof ventilator can be easily incorporated into a Topsail roof. A gap should be left in the decking where the ventilator is required. While the trims are being fixed to the roof, the ventilator can be nailed in place. The join should be bandaged and the laminate can be laid over the top of the base.

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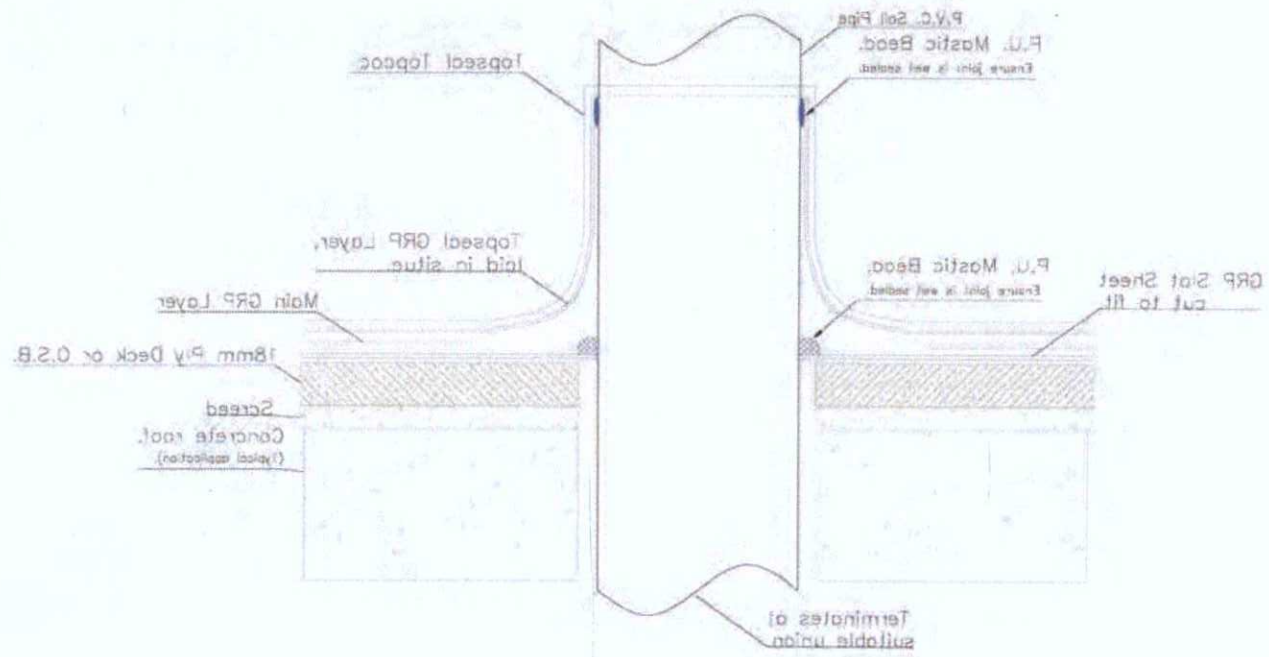
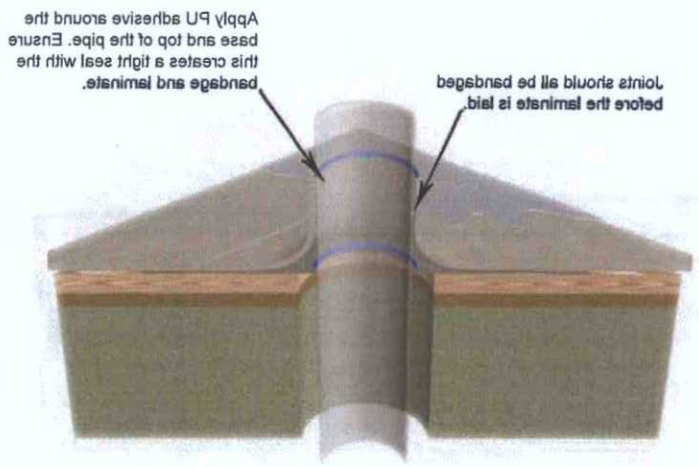
PVC soil pipe (or other extrusions)

Application instructions

The same procedure can be used for all extrusions on a roof. First cut a piece of F300 flat sheeting to fit around the extrusion nail it to the deck and seal any gaps with a bead of PU adhesive. Bandage over the joins in the sheeting and around the base of the extrusion. When laying the roof, ensure that the laminate extends up the base of the pipe.



Pre-formed PVC pipe outlet



Bonding GRP to metal

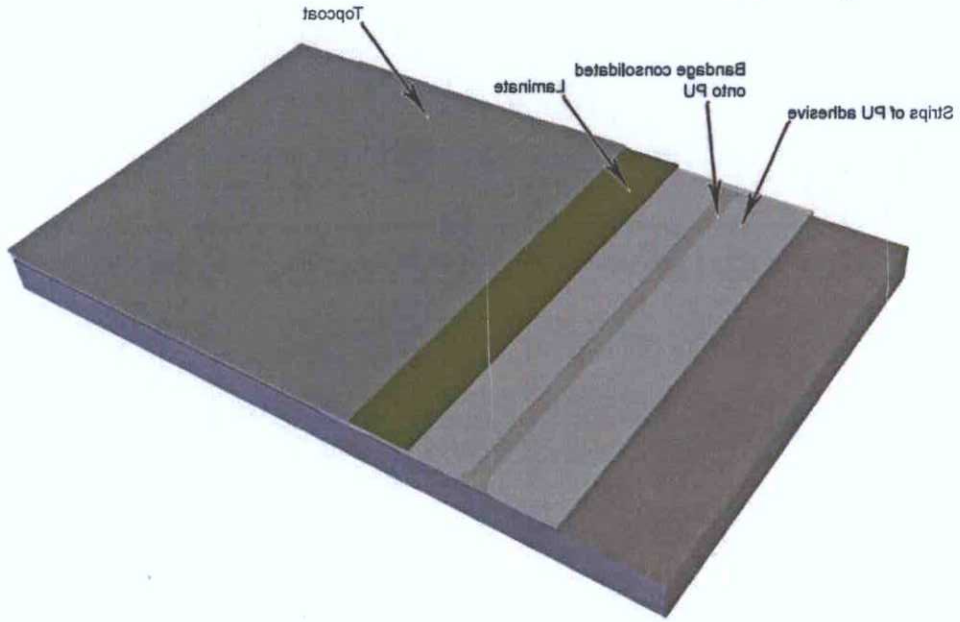
Application instructions

Polyester resins are poor adhesives and rely on the porosity of the substrate to affect a good bond, the bond to metals is poor. There is also the additional problem of differential expansion due to the difference of the coefficient of expansion between steel and GRP.

To overcome this problem there needs to be a good bond between the GRP and metal substrate which will remain flexible and tolerate the differential movement between the two dis-similar materials.

This can be achieved by using a moisture cured PU adhesive sealant trapped between the 2 materials as shown below:

Bonding GRP to metal



Preparation

Thoroughly clean the metal surface to be bonded onto. Remove all paint, rust etc., and ensure that the surface is clean and dry. It is best to wipe the surface with acetone to ensure no contamination.

Application

Using a skeleton gun, gun apply generous beads of PU adhesive onto the metal to be over-laminated. Where water will be running over this bonded area, or if this area is to be submerged, use 2 or 3 parallel beads in order to ensure complete sealing round the perimeter.

Immediately apply the CSM to the surface of the beads and rub into place. A more effective seal may be achieved by using a small consolidation roller to ensure that the adhesive is fully consolidated into the glass.

Leave to cure for about 2 hours. The PU is moisture cured and the curing reaction must finish before the laminate is applied over the top of the CSM. Apply resin to the CSM and form a laminate.

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Pond and pool lining

GRP is widely used for the manufacture of tanks, garden pools and swimming pools. It will give an inert, hard wearing, long lasting, waterproof skin, that will withstand ground movement and allow the use of aggressive cleaning techniques without danger of damage to the lining.

The technique involves the formation of a GRP laminate in situ using chopped strand mat reinforcement and suitable polyester resin and topcoat pigmented in any BS 4800 colour.

Important considerations when applying Topseal to a pond or pool lining

It is essential that only Topseal resins and topcoats are used to ensure that no residual taint occurs which may affect the contents of the lining. It is also vitally important that the laminate is allowed to cure completely before it comes into contact with water.

Always use summer catalyst when curing any resin or topcoat used for the lining, this gives a more consistant cure than winter catalyst and will give more predictable results.

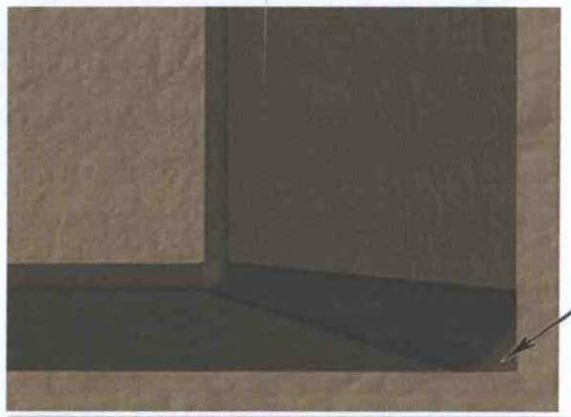
Preparation

A Topseal laminate can be applied to a concrete or masonry structure. It is important that the stonework is clean, dry and fully set. Any imperfections in the structure with be telegraphed through to the finished surface and may manifest themselves as weaknesses in the finished lining.

Before the laminate can be applied any angles in the structure need to be rounded off and it must be primed with G4 PU primer.

Corner Preparation

Rounding and smoothing off the corners makes the laminate easier to lay, it reduces any points of weakness and stress on the laminate and also makes the finished lining easier to clean.



Sharp angles are filleted using Topseal resin mixed with an inert filler, this can be slate dust, talk or chalk. Do not use cement or plaster as a filler, these substances are alkaline and will kill the cure it the laminate is laid on to them.

The filler is mixed at a ratio of 1 part Topseal catalyzed resin to 4 parts inert filler.

When the catalyzed resin filler has been mixed it can be applied to any sharp angles of the pond. A brush soaked with catalyzed resin can then be used to smooth off the compound and give a finish ready to laminate.

Application

The concrete surface should be primed with G4 primer. This is a moisture cured polyurethane coating that should be allowed to partially cure before applying the first coat of resin. If the primer is allowed to fully cure it will act as release agent and the GRP layer will not bond. If the primer has fully cured it will need to be reapplied.

Apply catalyzed resin to the tacky PU primer. The resin may then be allowed to cure before laying down the main laminates if the structure is too large to line in one session.

Firstly, all of the areas of highest stress should be bandaged, this includes all sharp angles, areas that have been treated with filled resin compound and steps, etc. It is vital to ensure that the GRP is applied to the surface without any air gaps or spaces remaining so it must be well consolidated. As with the main laminate, use a low reactivity catalyst (i.e. summer or LPT) at between 1 & 2%. Lay two 450g/m2 laminates onto the structure ensuring that they are both well consolidated. Lay the second laminate over the first while it is still uncured to increase inter-laminor adhesion. The laminate can be dressed around the perimeter pool with the use of capping stones (see portrait walls on page xx) which can be adhered to the laminate with PU adhesive, alternatively, a steel edging strip can be used. The laminate and stone structure of a pool should continue over the side of the pool and onto a flat surround to allow the laminate to be dressed over the side of the structure.

Depending on the quality of the finish required, the laminate may be finished with surface tissue and lightly abraded with medium grade sand paper when cured to ensure a smooth finish.

Pigmented topcoat can then be applied to the laminate using no more than 1-2% low reactivity catalyst. Pigment addition should be no more than 10%. Is is advisable to use only darker colours in pond applications. Where the topcoat is in permenant contact with water, 2 thin applications of topcoat can be used to give a perfect finish. The topcoat thickness should generally not exceed 0.5mm.

Pond and pool lining

Always excercise caution when applying resin or topcoat in very hot weather by using LPT catalyst. Avoid applying the topcoat in very hot direct sunlight as this can lead to 'tacky' topcoat.

Dark grey topcoat pigment normally gives the best appearance in a pool.

Curing the laminate

It is essential that the laminate is allowed to cure completely before it comes into any contact with any water. This avoids any taint of the water and 'staining' of the topcoat. The pool/pond should be kept completely dry by erecting a 'tent' or sheet over the top of the pool. In summer the sheet needn't be used when dry weather is forecast and the heat from the sun will assist the curing process. Otherwise a 1KW fan heater should be placed in the pool under the tent to heat the surface of the laminate. It is important that a fan heater is used, as the heat should be circulated over the surface.

No attempt should be made to fill the pool for two weeks after the topcoat has been applied. It is vital that the laminate is left to fully cure during this period. If the pool does get wet and 'staining' of the topcoat occurs it can be removed by 'cutting back' the laminate with T-Cut or Brasso. When this period or longer has passed the pool should be filled with a hose pipe and the water left to overflow for a period of 2 hours before the pond or pool is used. This process ensures that any surface wax or other debris is carried away with the overflowing water.

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Hygienic and other food contact linings

GRP can be used for a wide variety of different hygienic and food contact linings in any number of scenarios including kitchens, obdotoirs, farms and food transportation vehicles. It will give an inert, hard wearing, long lasting, waterproof skin, that will withstand ground movement and allow the use of aggressive cleaning techniques without danger of damage to the lining.

The technique involves the formation of GRP laminate in situ using chopped strand mat reinforcement and suitable polyester resin and topcoat pigmented to any BS 4800 colour.

Important considerations when applying Topseal to a pond or pool lining

It is essential that only Topseal resins and topcoats are used to ensure that no residual taint occurs that may affect the contents of the lining. It is also vitally important that the laminate is allowed to cure completely before it comes into contact with water.

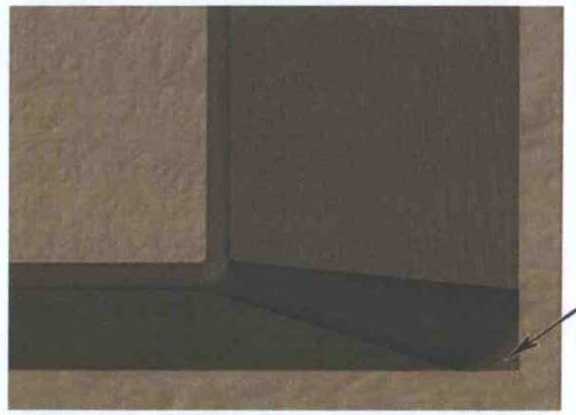
Always use summer catalyst when curing any resin used for the lining, this gives a more consistant cure than winter catalyst and will give more predictable results.

Preparation

A Topseal laminate can be applied to a concrete or masonry structure. It is important that the stonework is clean, dry and fully set. Any imperfections in the structure will be telegraphed through to the finished surface and may manifest themselves as weaknesses in the finished lining.

Before the laminate can be applied any angles in the structure need to be rounded off and it must be primed with G4 PU primer.

Corner Preparation



Rounding and smoothing off the corners makes the laminate easier to lay, it reduces any points of weakness and stress on the laminate and also makes the finished lining easier to clean. Sharp angles are filleted using Topseal resin mixed with an inert filler, this can be slate dust, talk or chalk. Do not use cement or plaster as a filler as these substances are alkaline and will kill the cure in the laminate laid on to them.

The filler is mixed at a ratio of 1 part Topseal catalyzed resin to 4 parts inert filler.

When the catalyzed resin filler has been mixed it can be applied to any sharp angles of the pond. A brush of catalyzed resin can then be used to smooth off the compound and give a finish ready to laminate.

Application

The concrete surface should be primed with G4 primer. This is a moisture cured polyurethane coating that should be allowed to partially cure before applying the first coat of resin. If the primer is allowed to fully cure it will act as release agent and the GRP layer will not bond.

Apply catalysed resin to the tacky PU primer. The resin may then be allowed to cure before laying down the main laminates if the structure is too large to line in one session.

Firstly, all of the areas of highest stress should be bandaged, this includes all sharp angles, areas that have been treated with filled resin compound and steps, etc. It is vital to ensure that the GRP is applied to the surface without any air gaps or spaces remaining so it must be well consolidated. As with the main laminate use only Topseal resins with a low reactivity catalyst (i.e. summer or LPT) at between 1 & 2%.

The structure can be laminated with either 2 x 450g/m² laminates or 1 x 600g/m² laminate depending on the required usage of the areas. If applying two laminates, lay the second laminate over the first while it is still uncured to increase inter-laminar adhesion.

Depending on the quality of surface finish required, the laminate may be finished with surface tissue and lightly abraded with medium grade sand paper when cured to ensure a smooth finish.

Hygienic and other food contact linings

Pigmented topcoat can then be applied to the laminate using no more than 1-2% low reactivity catalyst. Pigment addition should be no more than 10%. Where the topcoat is in permenant contact with water, 2 thin applications of topcoat can be used to give a perfect finish. The topcoat thickness should generally not exceed 0.5mm.

Curing the laminate

It is essential that the laminate is allowed to cure completely before it comes into any contact with any moisture or water. This avoids any taint to anything kept in the area and 'staining' of the topcoat. The room or area should not be used until the laminate is completely cured. The curing regime should ideally involve heating the root up to 60°C with high output fan heaters ensuring the air is circulated around the room. This should be continued for 24 hours, the room should then be thoroughly ventilated without heat opening all windows, doors etc. and expelling all of the air that has been in the room. The process should then be repeated for another 24 hours at 60°C.

After this the room should not be used before one week since the topcoat was applied.

If the 60°C temperature can not be obtained then the room should be heated as much as possible, using central heating, fan heaters etc. It is still important in this circumstance that the heat is circulated around the room using fans if necessary. After 24 hours at maximum heat the room should be completely ventilated and the process repeated 3 more times. Again, the room should not be used within one week since the topcoat was applied.

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Bund lining

GRP has been used successfully for lining both fuel storage, water and chemical storage areas.

For chemical and solvent storage it is important to ascertain the storage temperature and concentration of the chemical to be contained. For very aggressive alkaline preparations (bleach) a high performance resin or top coat may be specified. Generally, Topseal's standard GRP roofing materials are perfectly good for this application and will easily withstand occasional contact with the stored chemical, but, more importantly, withstand all the mechanical wear and tear that may take place within the bund area for general maintenance etc. It is also important to remember that the bund lining must withstand UV degradation since it must retain its integrity for the life of the installation.

Preparation

The entire floor and wall area within the bund must be clean and dry, and free of other surface preparations.

The entire surface area should be coated with a moisture cured PU (our G4 primer) and allowed to partially cure for 2-4 hours.

Application

The initial resin application should then be applied directly to the partly cured PU and allowed to cure.

The laminate can consist either 1 X 600g/m^2 laminate or 2 x 450g/m^2. Laminations should then be applied to the prepared surface in clean, dry conditions, ensuring that all surface details, pipework and drain outlets are sealed or fully lined with GRP.

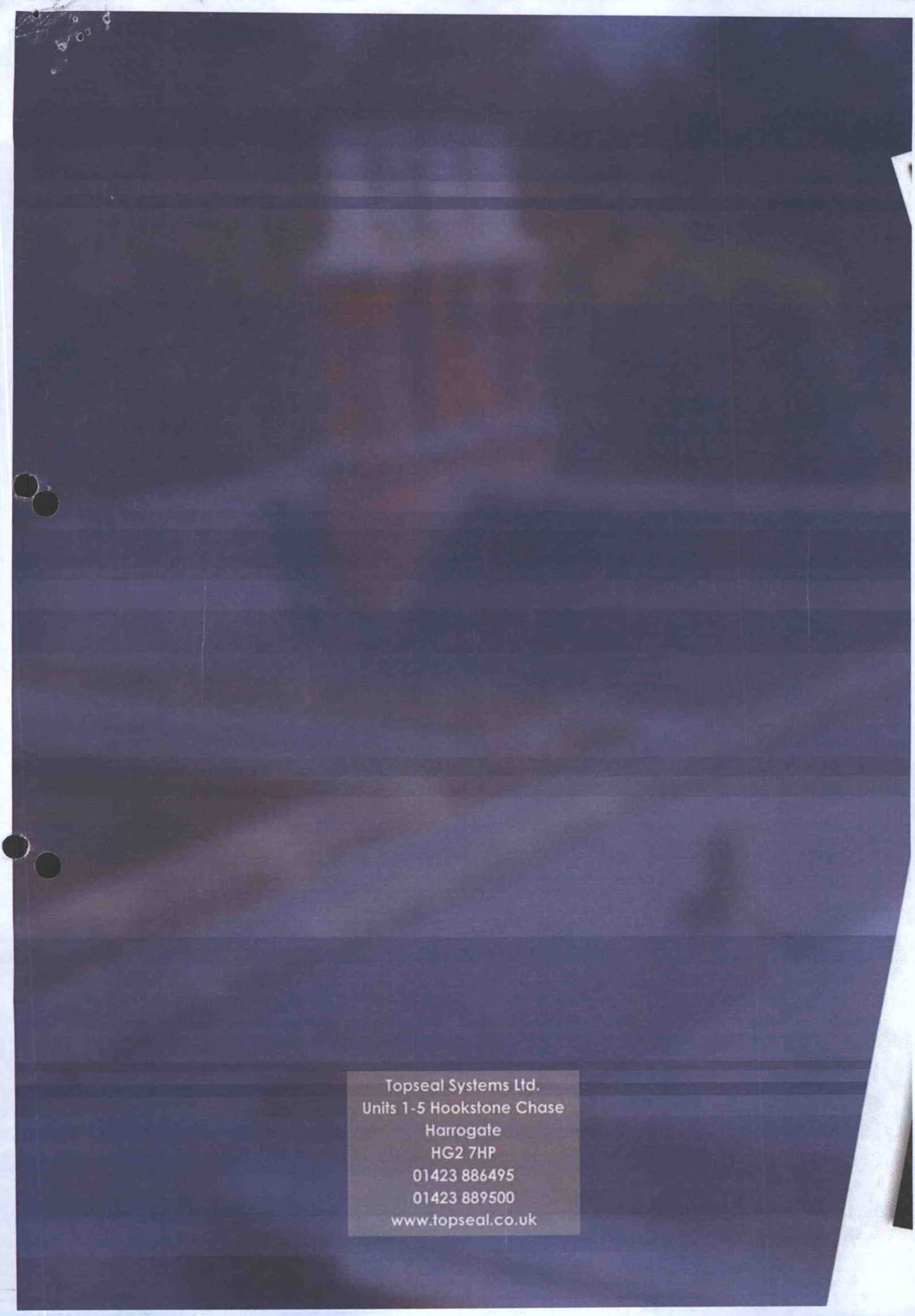
The top coat should be applied to the GRP layer within 4 hours of the initial cure. A non-slip finish may be included into areas where foot traffic is anticipated, especially if lubricants may be used or spilled within the bund.

The final topcoat coating should be applied to the laminate within 4 hours of the initial cure (any BS4800 colour can be specified.) A non-slip finish may be incorporated into areas where foot traffic is anticipated, especially if lubricants may be used or spilled within the bund.

The laminate may be sept or cleaned with a cold or hot pressure washer. Steam cleaning should be avoided.

The Topseal layer may be modified or repaired as required and should be inspected after a spillage of the stored chemical into the bund area.

Water may be allowed to accumulate in the bund area without any detriment to the Topseal layer.



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