



*fatra*

Technical Specification

## Planterbox PVC Membrane System

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# PROPOSED | System

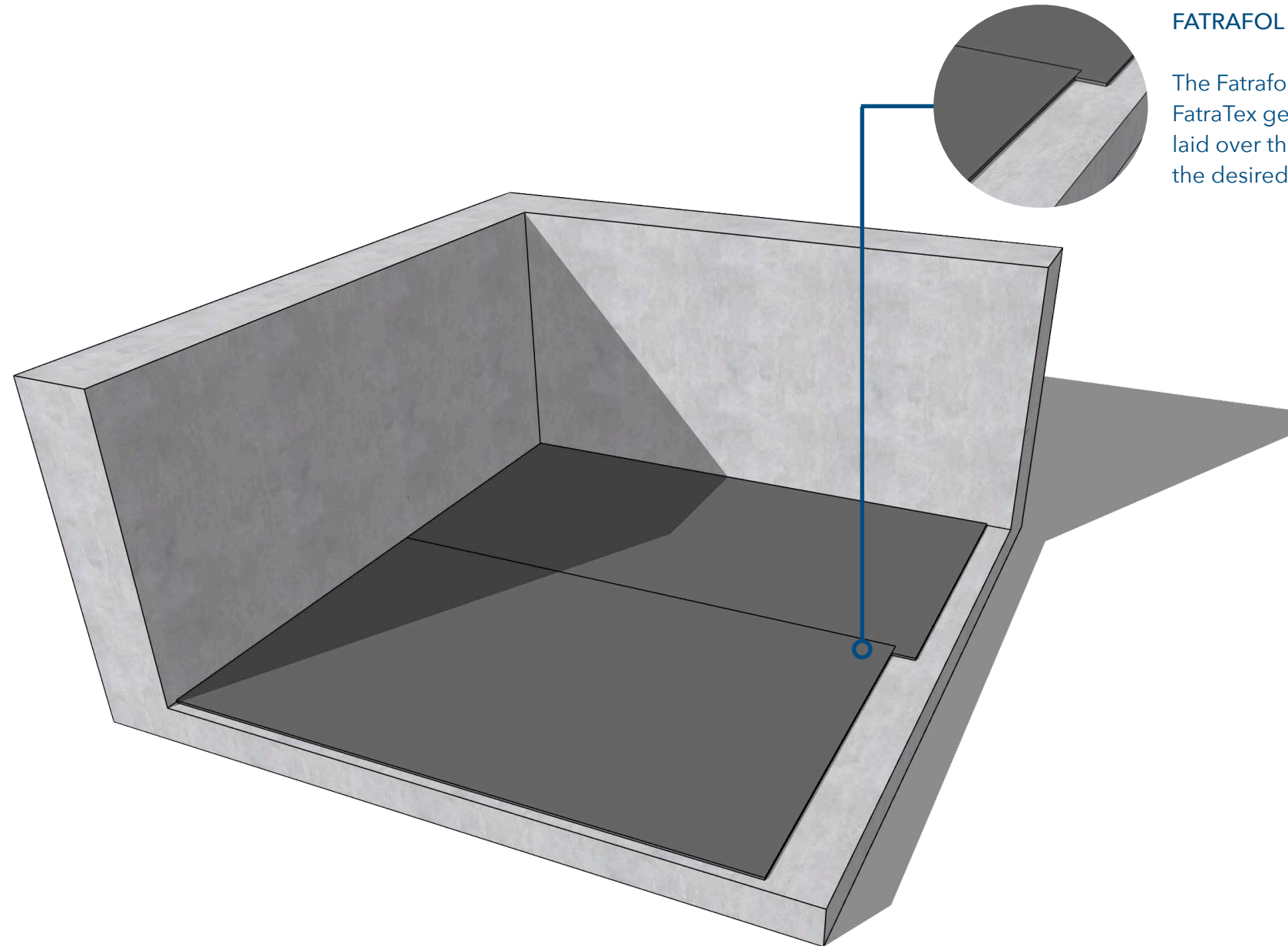
The Fatra ballasted planter box system incorporates the Fatrafol 810v PVC membrane waterproofing system with the Fatra Armour protection layer, Fatra drainage cell, filter fabric and vegetation layer to create the perfect planter box system.

The specifications for the different layers will depend on the clients objectives, requirements and project-specific specifications.

Fatra provide all components for planter box projects making it simple and convenient for our approved contractors.

The Fatrafol PVC membranes are tested to FLL standards and are proven to withstand root penetration from the most aggressive roots such as birch and oak trees. No additional protection layers or root resistant coatings are required unlike traditional bitumen and liquid membranes.

Fatrafol membranes are 100% recyclable and can be made using up to 30% recycled materials making Fatra waterproofing membranes the most sustainable and environmentally friendly waterproofing membranes on the market today.

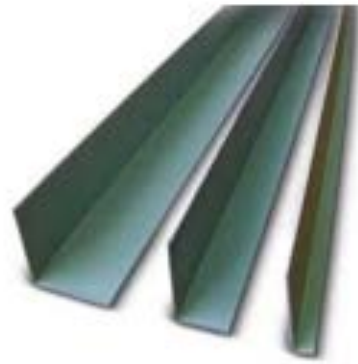


## FATRAFOL 810v | REINFORCED PVC SHEET MEMBRANE

The Fatrafol 810v reinforced membrane is installed over the FatraTex geotextile protection layer. The Fatrafol 810v is loose laid over the protection layer and is ballasted into place by the desired ballast.



# FATRANYL METAL | Ancillaries



## FATRANYL | Chase Termination Metal

50mm x 15mm PVC coated zinc/stainless steel angle for termination of PVC membrane upturns. To be installed and mechanically fixed into a continuous saw-cut slot. A 2mm - 5mm gap between each section of metal is required to allow for structural movement. Metals are to be mechanically fixed at 150mm centres using the relevant fixings with a band of polyurethane/modified silicone sealant into the saw-cut slot and across the top of the termination metal to provide adequate seal.

## FATRANYL | Internally Coated Peel Stop Bar

40mm x 40mm internal PVC coated zinc/stainless steel angle for the base of all perimeter and internal wall upturns to provide protection from high wind exposure and shrinkage of membrane. To be installed and mechanically fixed over the field sheet membrane. A 2mm - 5mm gap between each section of metal is required to allow for structural movement. Metals are to be mechanically fixed at 150mm centres using adequate fixings.

## FATRANYL | Externally Coated Termination Metal

50mm x 50mm external PVC coated zinc/stainless steel angle. To be installed over hob detailing to provide protection from sharp edges affecting the PVC membranes performance. A 2mm - 5mm gap between each section of metal is required to allow for structural movement. Metals are to be mechanically fixed at 150mm centres using adequate fixings.

## FATRANYL | Externally Coated Crush & Fold Metal

50mm x 50mm x 15mm external PVC coated zinc/stainless steel angle. To be installed to the outside edge of the perimeter hob to provide protection from sharp edges affecting the PVC membranes performance and provide a termination metal which sits slightly away from the outside vertical face of the building to prevent moisture running down the face of the building. A 2mm - 5mm gap between each section of metal is required to allow for structural movement. Metals are to be mechanically fixed at 150mm centres using adequate fixings.

## FATRANYL | PVC Coated Site Specific Metals

Fatra have the ability to fabricate any termination metals, flashings and such items to site specific requirements. This will be established upon completion of a site survey by a Fatra Australia representative.

All fixing specifications, centre of fixings and relevant information regarding the fixing of the termination angles will be provide by Fatra Australia Pty Ltd based on the system being implemented, substrate and wind load calculations provided by Fatra Australia Pty Ltd.



## PREFABRICATED | Rainwater Outlets

The prefabricated outlets are inserted in the rainwater outlet after the field sheet membrane has been installed. The outlets come complete with the back flow protection flange. The PVC membrane flange is then simply hot air fusion welded to the field sheet achieving a consistent 50mm weld around the entire perimeter.



## PREFABRICATED | Pipe Collars

The prefabricated pipe collars cover all different diameters of pipes/post. The prefabricated pipe collars drastically reduce installation and material cost whilst providing an added benefit of being able to wrap the collars around the pipes and posts when you're restricted to sliding them over the top.



## PREFABRICATED | Wall Outlets

The prefabricated wall outlets are inserted in the rainwater outlet after the PVC membrane has been installed. The outlets come complete with the back flow protection flange. The PVC membrane flange is then simply hot air fusion welded to the membrane achieving a consistent 50mm weld around the entire perimeter.



## PREFABRICATED | Internal & External Corners

The Fatra prefabricated corners are used to improve the aesthetics of the system for corner detailing. The corners also reduce labour install times onsite reducing the overall cost of the system.



## PREFABRICATED | Wall Overflows

The prefabricated wall overflows are inserted in the wall overflow pipe after the PVC membrane has been installed. The outlets come complete with the back flow protection flange. The PVC membrane flange is then simply hot air fusion welded to the membrane achieving a consistent 50mm weld around the entire perimeter.



## FATRABOND | Contact Adhesive

The Fatrabond contact adhesive is a two sided application to both Fatra PVC membrane and the substrate its being applied to. The fatrabond contact adhesive can be applied to high parapet walls to avoid bagging of the membrane and improve the aesthetics of the the vertical membrane.

## SYSTEM | Benefits

Excellent resistance to weather  
Structural strength & resistance to mechanical stress  
UV stable  
Reflects up to 80% of UV Radiation  
Reduced H&S risk  
Cost affective  
High chemical resistance  
Root resistant  
Excellent fire rating  
High tensile strength  
100% recyclable material  
Lightweight  
Excellent weldability  
ISO 9001 Accreditation  
ISO 14001 Accreditation  
FM Approval Certification  
BRE Eco Point  
BBA certified 30 year life expectancy  
Material warranties up to 25 years  
Installation Quality Inspection throughout installation  
Reduced time and leak detection costs

## FATRA | Accreditation



**BREEAM**®



# PREPARATION |

Ensure the surface is clean, dry and free from dirt and debris prior to commencing works onsite. Remove any protruding items in the surface which may damage the PVC sheet membrane. All mechanical plant, air conditioning units and associated item must be lifted slightly from the surface when installing the field sheet membrane to enable the membrane to be installed over the entire area.

Care must be taken to avoid damaging or disjoining the air conditioning units. Decommissioning may be required. Once the field sheet membrane has been installed the feet of the mechanical plant units must have suitable protection installed below to protect the PVC membrane. The plant can be lowed back down as soon as the field sheet has been laid and fully inspected for defects.

The existing membrane and substrate is to be assessed by a certified and approved engineer/consultant prior to commencing any works onsite to ensure a full scope of works relating to appropriate methodologies of preparation required is provided.

All preparation is to be carried out in accordance with engineer/consultants reports and Fatra Australia's technological methodologies. Preparation considerations include but aren't limited to:-

- A. Removal of existing membrane if existing membrane is deemed unsuitable to install directly over.
- B. Removal of defected sections of existing membrane such as vulcanised laps, bubbling and or delaminating membranes, corner fillets, cast in reglets and outlets.
- C. Removal of cappings, flashing, skylights, doors, mechanical plant and similar items which will impede the installation process.
- D. Localised repairs to cracks, expansion joints and similar aspects
- E. Mechanical surface grinding
- F. Re-levelling, creation or rectification of falls.
- G. Priming or sealing of the surface
- H. Cleaning and removal of any dirt, debris or chemicals present on the substrate.
- I. Removal of redundant materials present within the area.

# STORAGE |

Materials are to be stored in a safe location and avoid being exposed to the elements or other damage such as mechanical or external contractors. All materials are to be stored in a safe and secure manner which will not result in dislodgement or displacement. Fatrafol membranes are to be covered and protected from the UV at all times until the point of installation of the Fatrafol PVC membrane to protect the underside of the PVC membrane rolls from being exposed to the UV.

It is advisable that loose items such as Fatranyl angles, fixings and associated accessories are stored in a safe and secure box to prevent them being damaged or displaced.

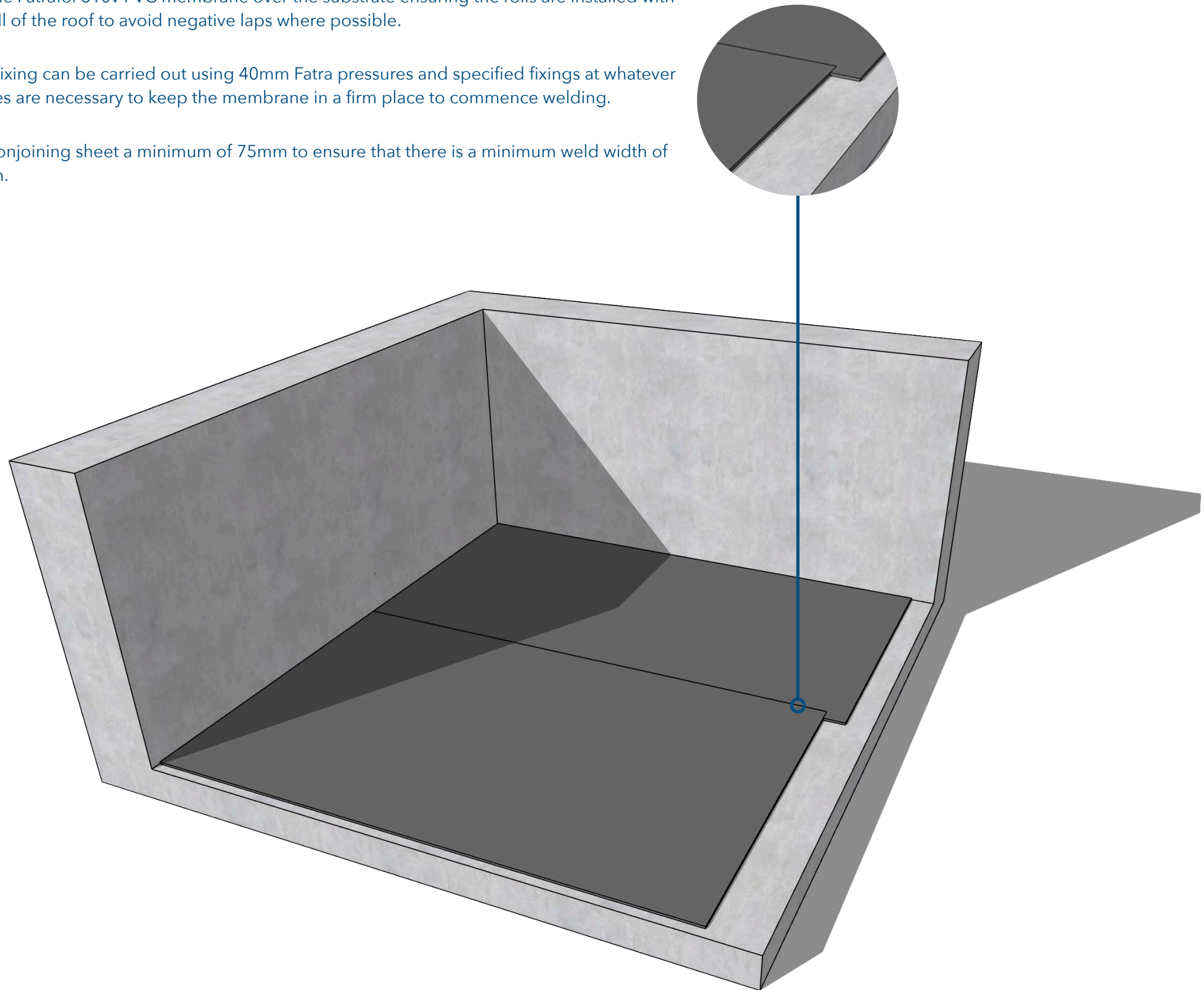
# FATRAFOL | 810v PVC SHEET MEMBRANE

1 |

Roll the Fatrafol 810v PVC membrane over the substrate ensuring the rolls are installed with the fall of the roof to avoid negative laps where possible.

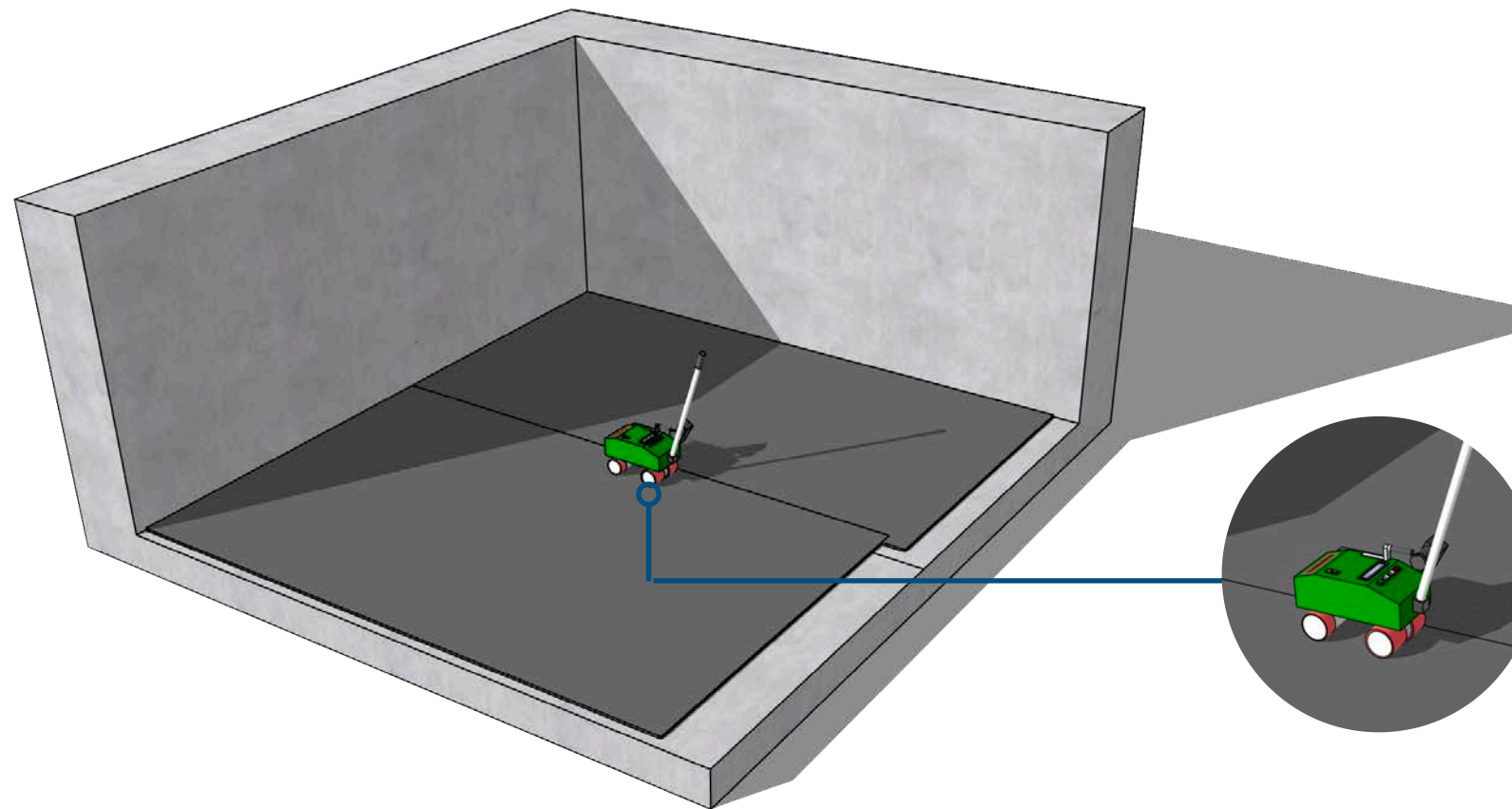
Spot fixing can be carried out using 40mm Fatra pressures and specified fixings at whatever centres are necessary to keep the membrane in a firm place to commence welding.

Lap adjoining sheet a minimum of 75mm to ensure that there is a minimum weld width of 40mm.



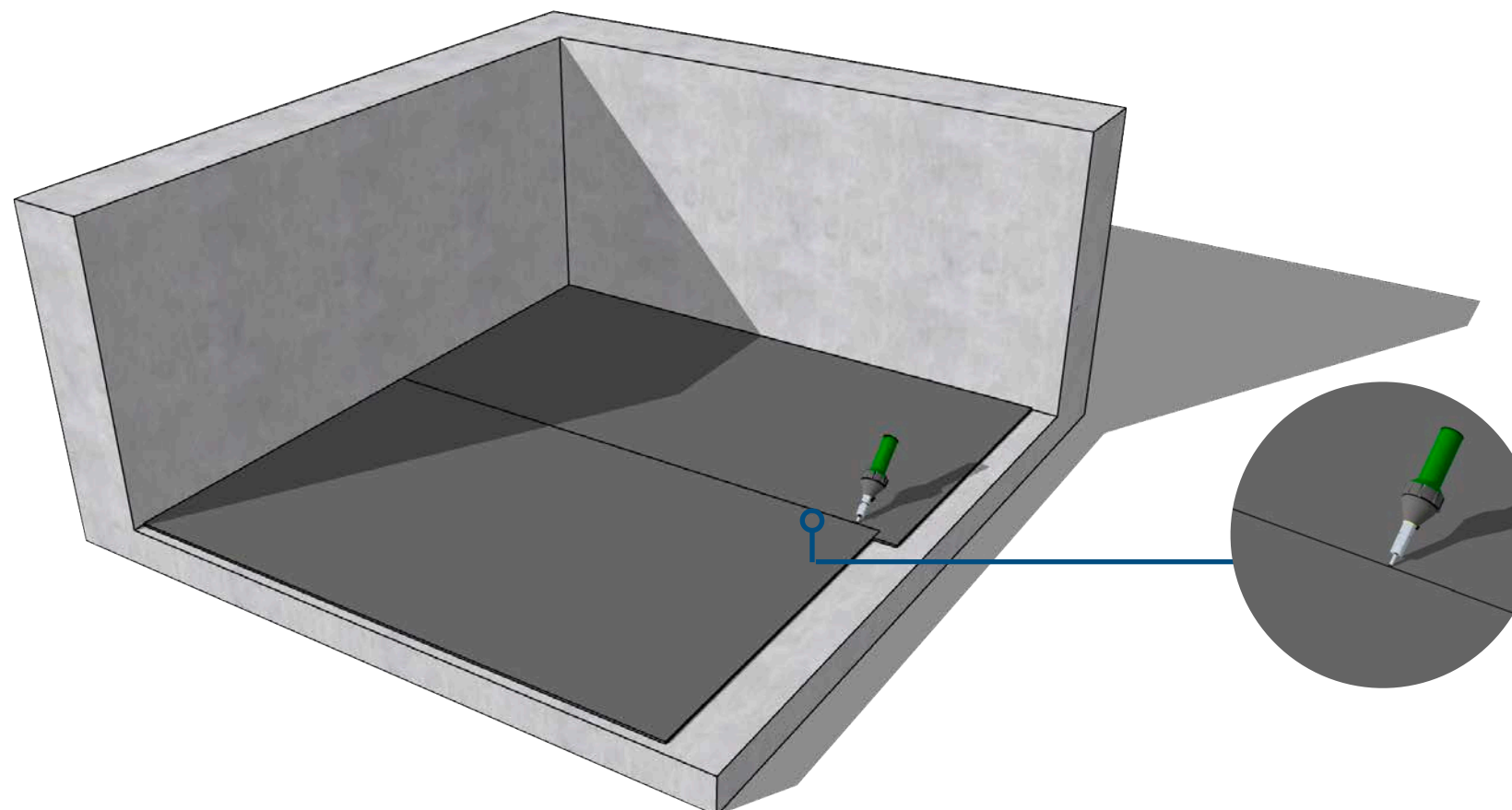


# FATRAFOL | 810v PVC SHEET MEMBRANE



1 |

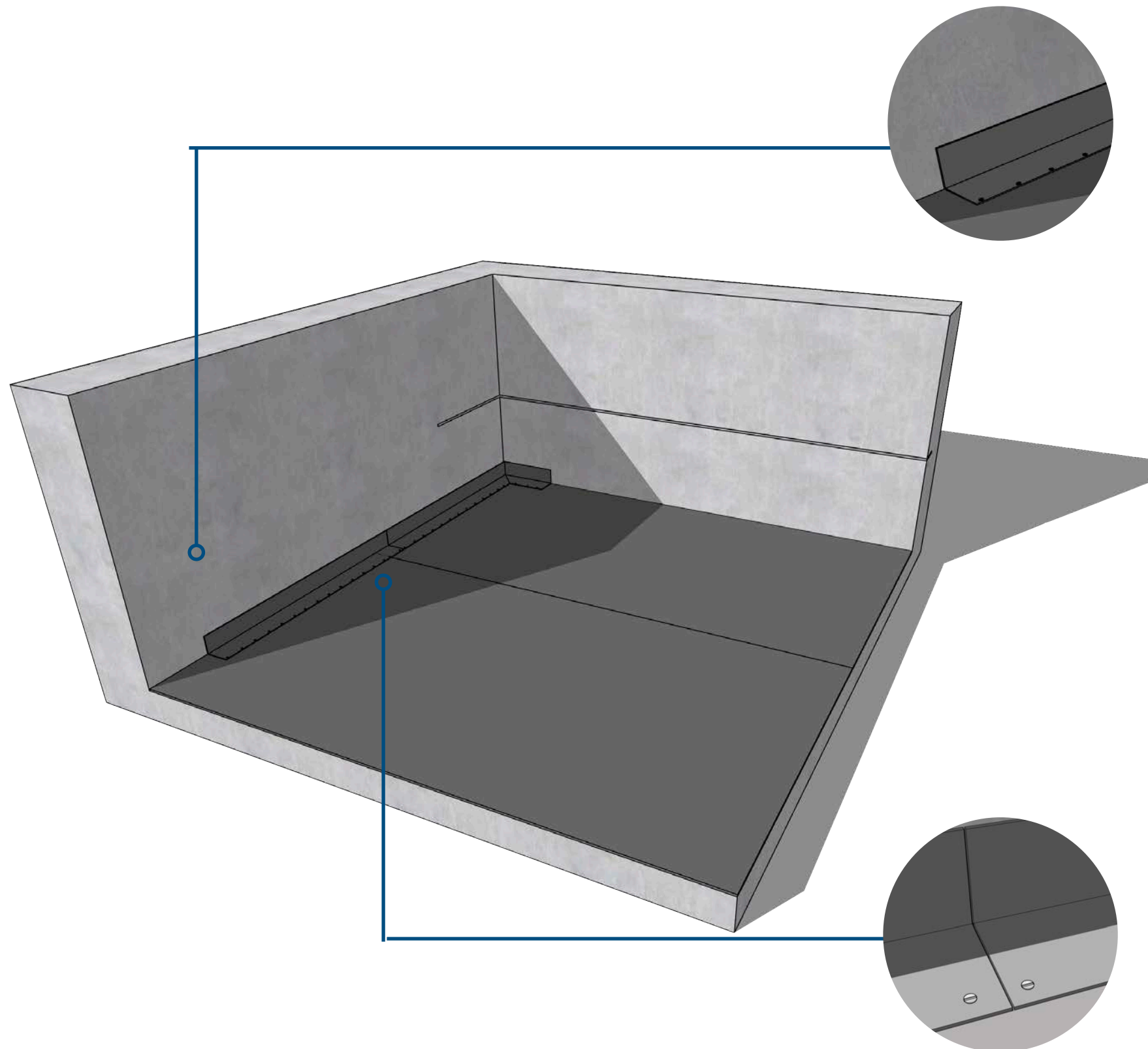
The Fatrafol 810v conjoining sheets must overlap at least 70mm to enable an adequate weld width on conjoining sheet. Each lap must achieve a minimum 40mm weld width. Roll end laps must be staggered. Laps are to be tacked to the rear of the overlap in line with the pre weld at approximately 500mm centres to temporarily hold into place prior to fully welding the conjoining sheets. A pre-weld to the rear of the overlap is to be installed closing the lap to produce an air seal. A final weld is to be installed achieving a consistent bleed protruding from the lap producing a final homogenous weld and complete waterproof seal. T-joints must always be staggered. These sections create extra thickness in the membrane lap and can leave a capillary joint.



2 |

When the roll of membrane ends and meets the start of a new roll, ensure the conjoining sheet is overlapped 70mm to enable an adequate weld width to the conjoining sheet. Spot weld each corner into position to avoid the conjoining sheet moving and decreasing the gap between sheets. Once this has been spot welded, hot air fusion weld both sheets together following the principals outlined above, achieving the adequate weld width of 40mm. Ensure corners are mitred to achieve maximum aesthetics to the roll end joints. Wherever possible, ensure the overlap joints are negative to avoid any water sitting on the welded joint between the Fatrafol sheet membrane.

# VERTICAL UPTURN TERMINATION | INTERNAL PEEL STOP ANGLES



1 |

Once the field sheet has been fully installed, a Fatranyl internally coated PVC peel stop angle must be installed to all horizontal and vertical junctions. When installing Fatranyl internally coated angles, ensure the angles contour fully with the substrate and do not protrude off the surface.

The Fatranyl angle is mechanically anchored over the field sheet at 150mm centres using Fatra approved fixings into the substrate. The fixing locations must always be no closer than 10mm from the edge of the Fatranyl angle but always in the bottom third section to allow enough room to complete a hot air fusion weld when installing the PVC membrane strap.

2 |

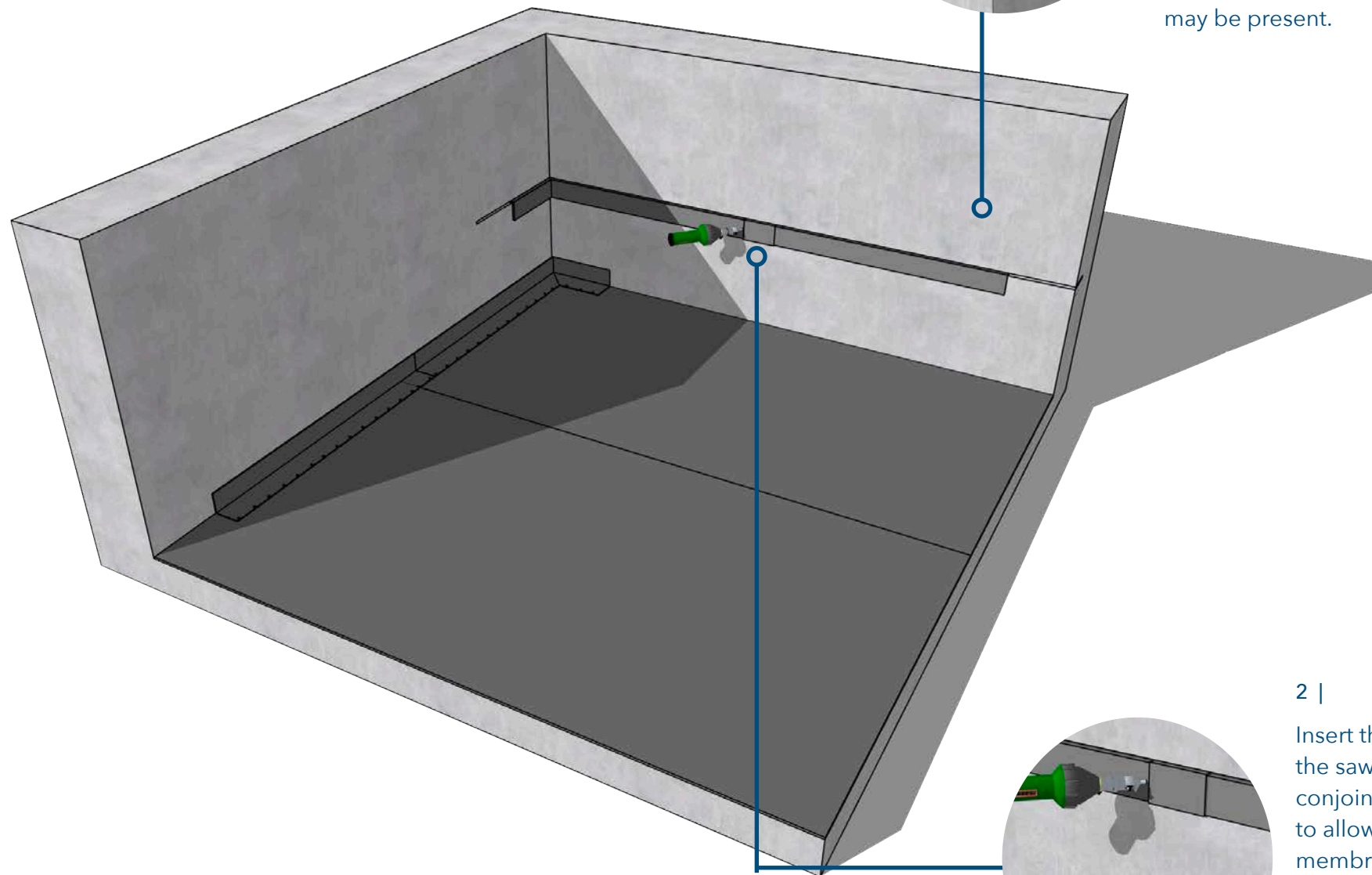
All conjoining angles must have 2 - 5mm gap between each metal to allow for structural movement. The Fatranyl internally coated angle minimises shrinkage which may occur. Internally coated angles are to be installed to every horizontal and vertical junction and are to be fixed over the field sheet membrane at all times.

# VERTICAL UPTURN TERMINATION | CHASE DETAIL

1 |

Where the Fatra system is to be terminated into a vertical upturn, a Fatranyl PVC coated chase termination saw cut profile is to be installed.

At the specified height of termination, saw cut a continuous slot into the vertical substrate approximately 20mm deep to enable the Fatranyl angle to be inserted into the saw cut slot. Once the grinding of the saw cut reglet has been completed, vacuum out any dust and debris that may be present.

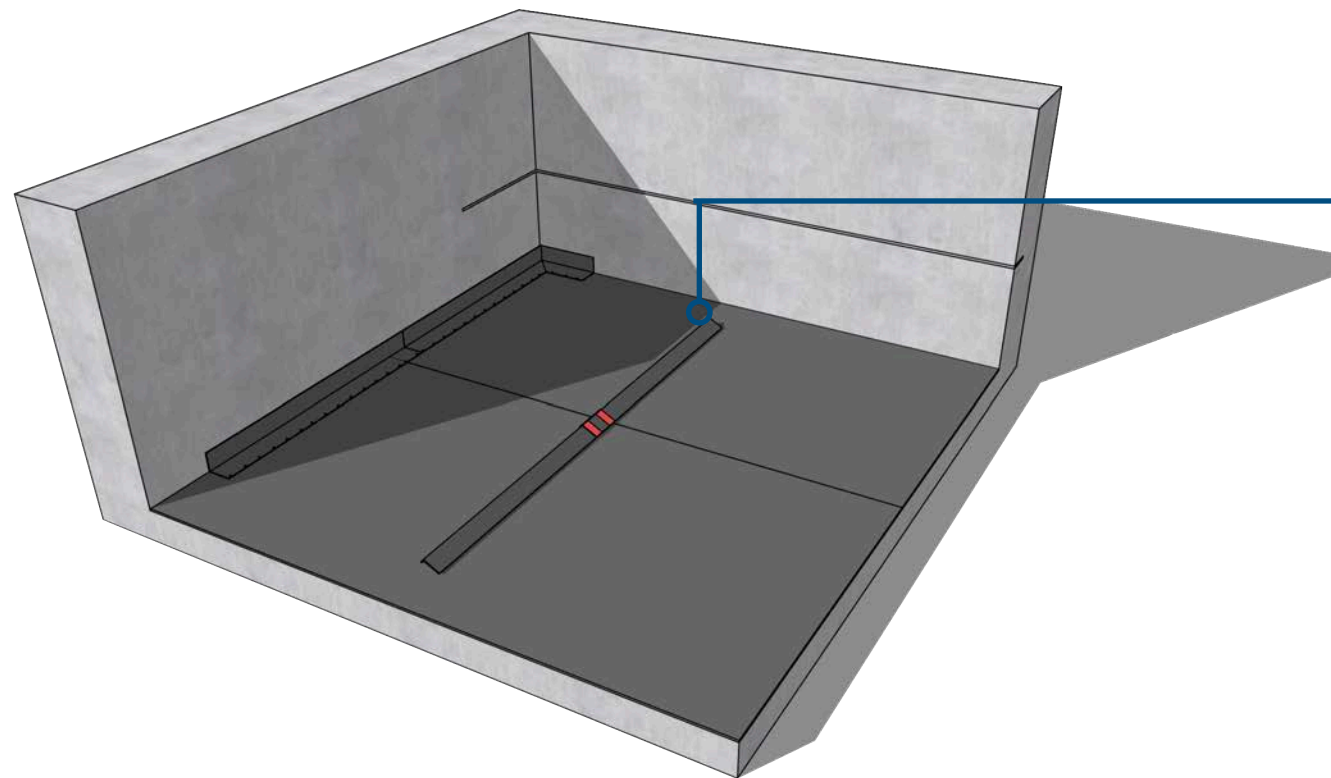


2 |

Insert the Fatranyl PVC coated chase termination angles into the saw cut reglet but do not fix into place. Ensure conjoining Fatranyl angles are approximately 2 - 5mm apart to allow for expansion. Place Fatrafol 804 detailing membrane butt strap over the expansion gap covering the entire horizontal and vertical surfaces of the Fatranyl angles lapping a minimum of 50mm onto each conjoining angle. Hot air fusion weld the Fatrafol 804 butt strap to the vertical face of the Fatranyl angle to connect the chase angles together achieving a weld width of 40mm

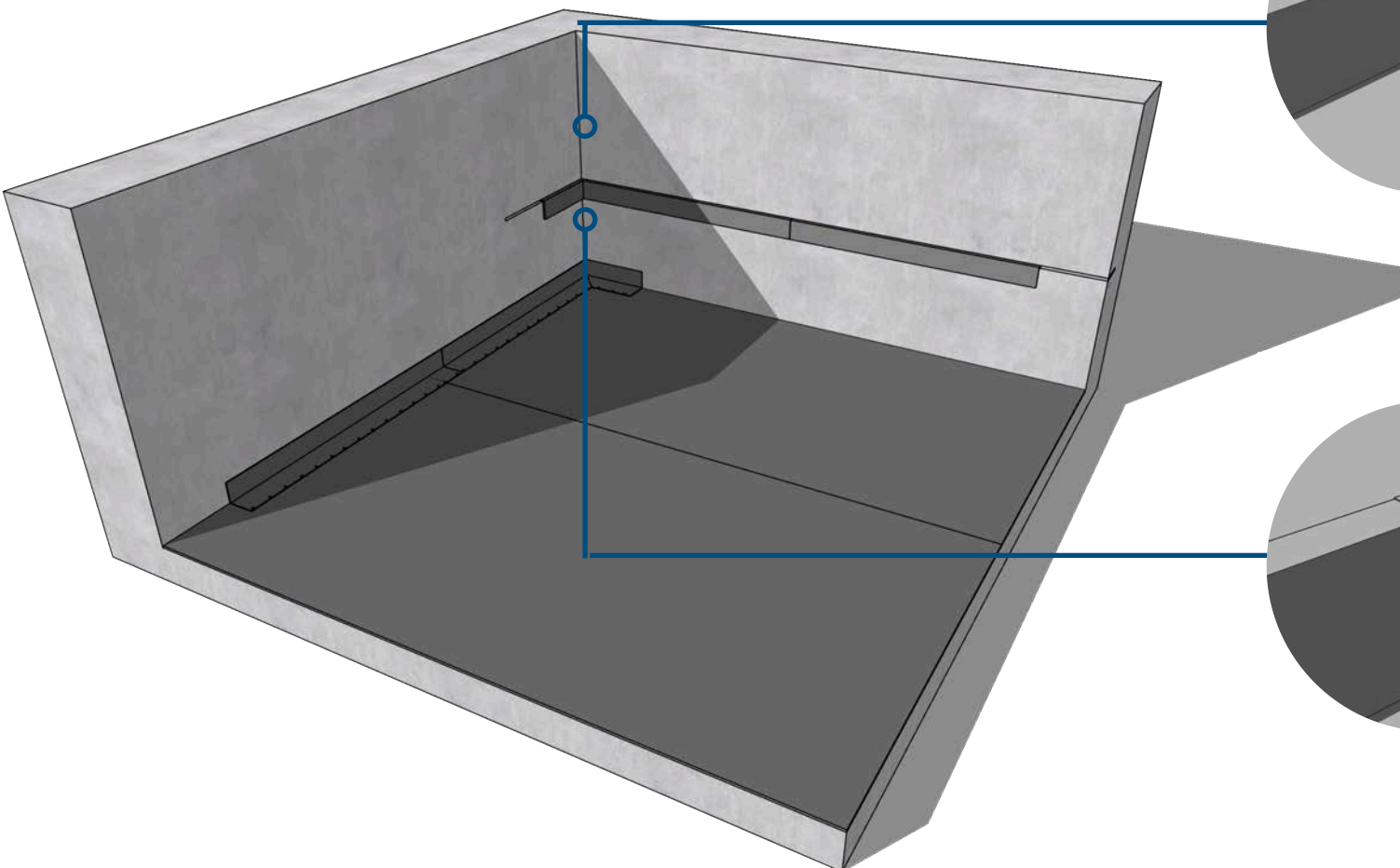
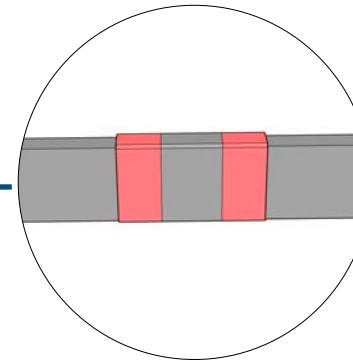


# VERTICAL UPTURN TERMINATION | CHASE DETAIL



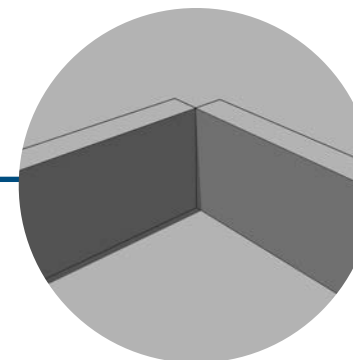
## 3A |

Once the Fatrafol 804 butt straps are welded to the vertical face of the Fatranyl angles, remove the connected angles from the saw cut reglet. Once the Fatranyl angles are removed, hot air fusion weld the top horizontal plane to the Fatrafol 804 butt strap to full seal the Fatranyl angle. The image to the right indicates in red the specific areas which are to be fully hot air fusion welded.



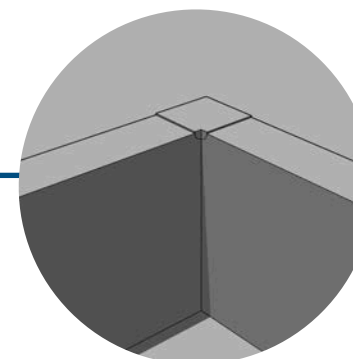
## 3B |

Where a change in direction is present and requires a chase termination profile to be installed. Mitre the 15mm horizontal section of the chase termination angle to enable the Fatranyl angle to contour with the change of direction. This reduces gaps in the termination angle and provides a more reliable termination detail.



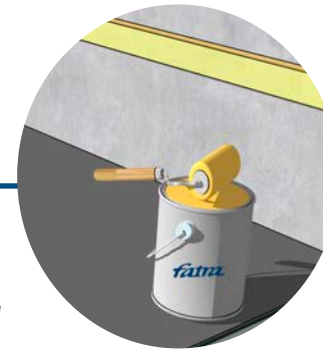
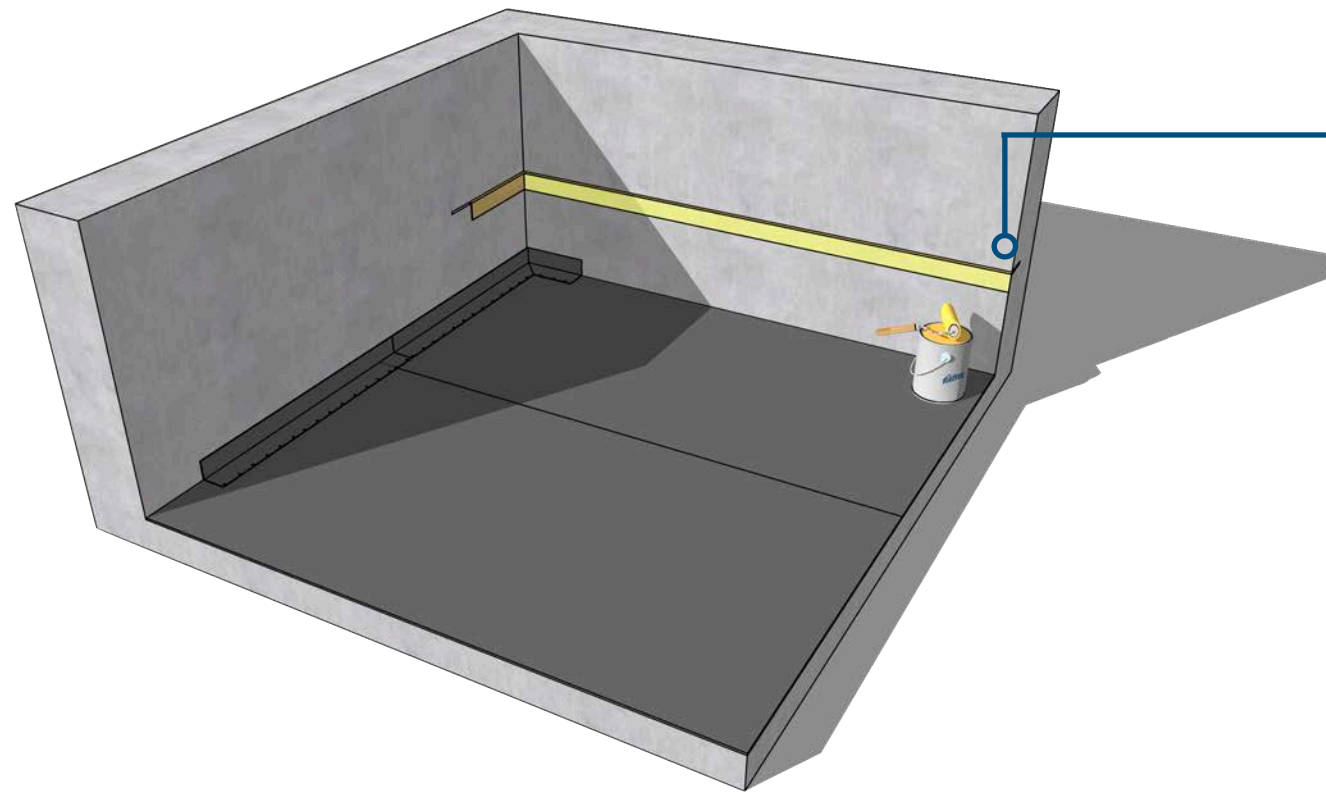
## 3C |

Once the Fatranyl angle has been mitred, hot air fusion weld a triangular Fatrafol 804 PVC patch to bridge the gap where the Fatranyl angle has been mitred. Ensure the PVC patch protrudes down the vertical face of the Fatranyl angle to completely cover any gaps in the Fatranyl angle.



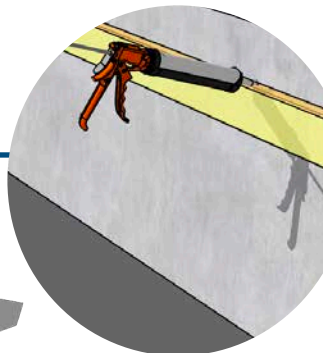
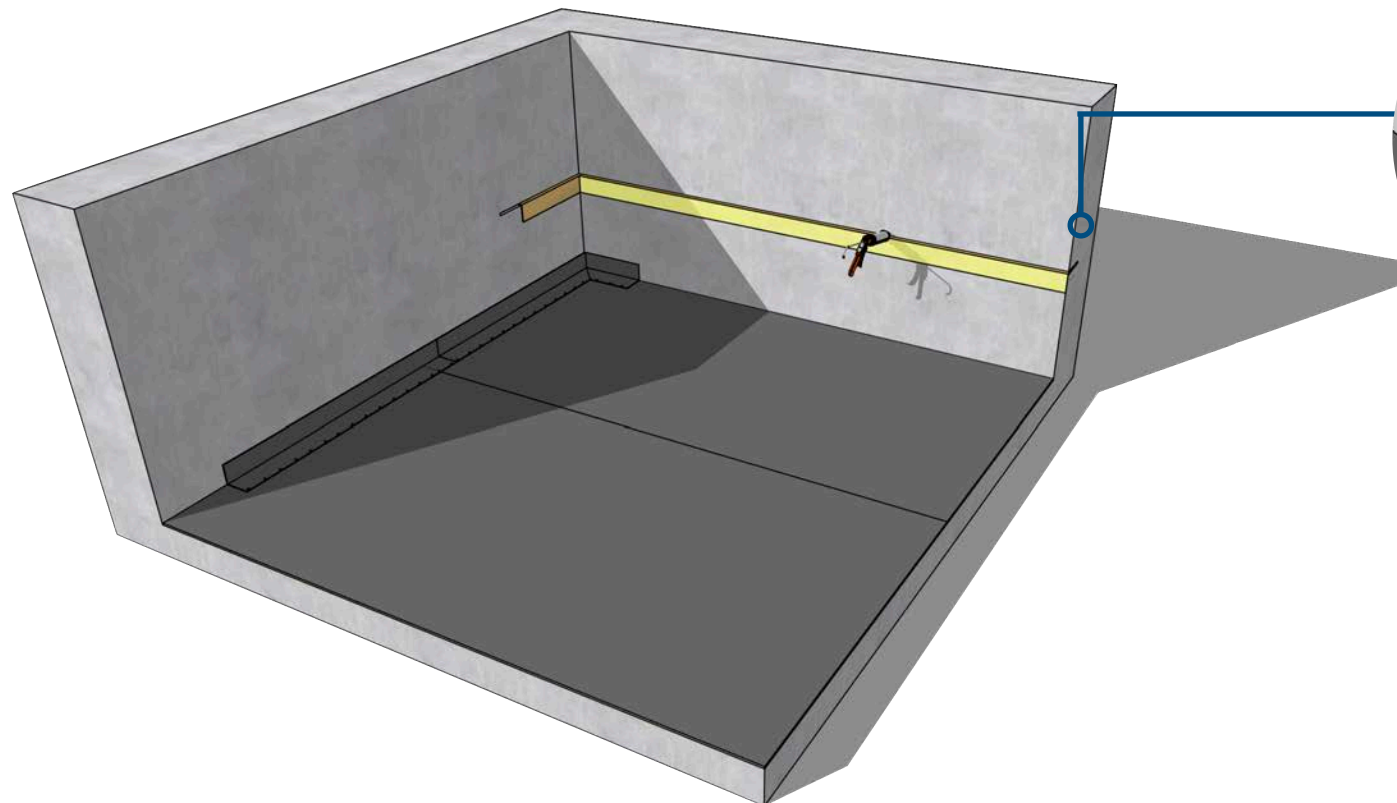


# VERTICAL UPTURN TERMINATION | CHASE DETAIL



4 |

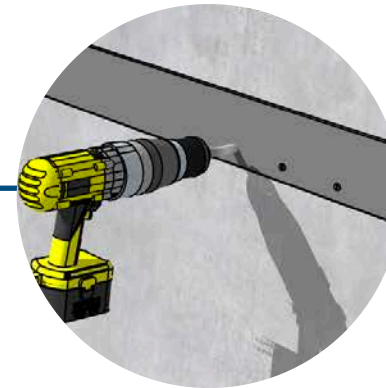
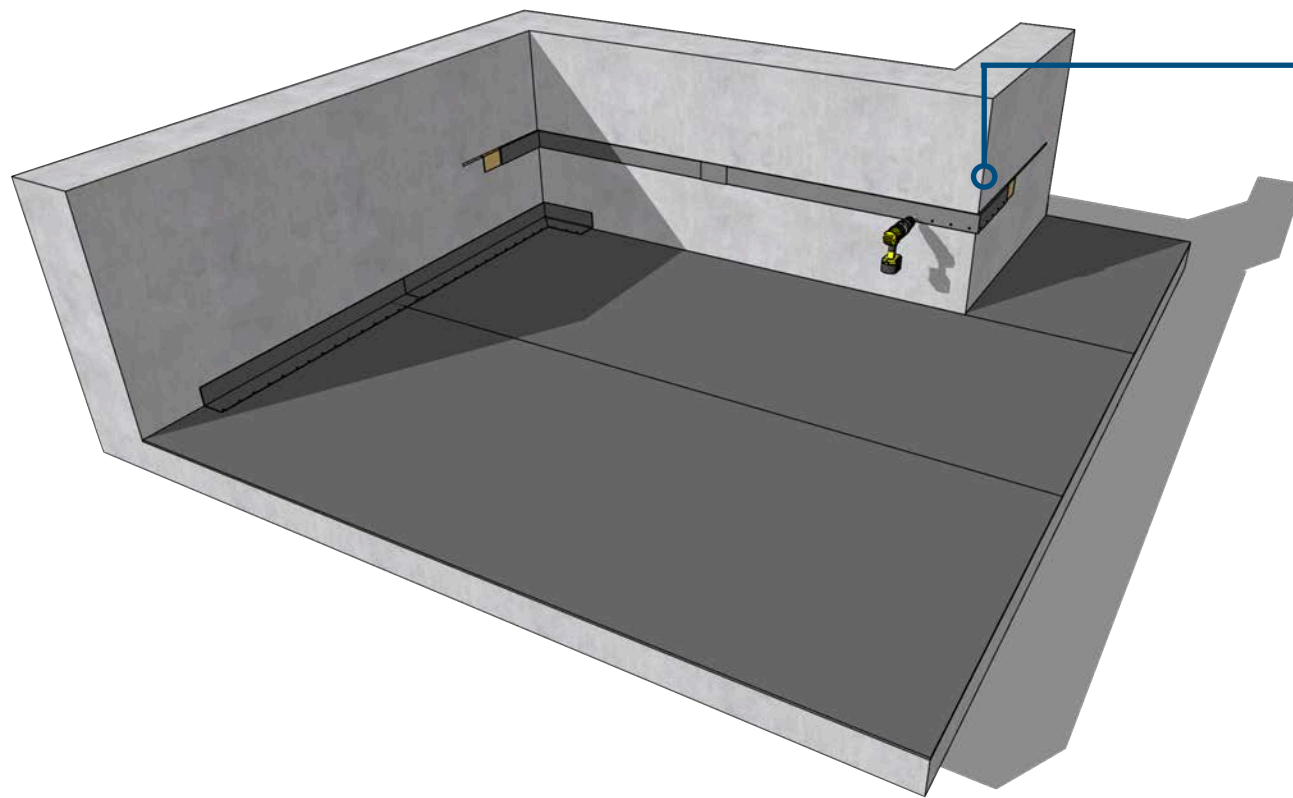
Using a Fatra approved primer, apply the primer in accordance with suppliers recommendations to the areas where an approved sealant will be applied. Ensure an even and consistent coverage is achieved.



5 |

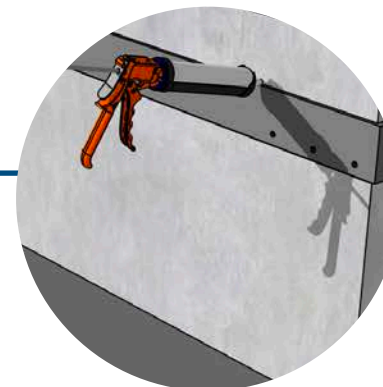
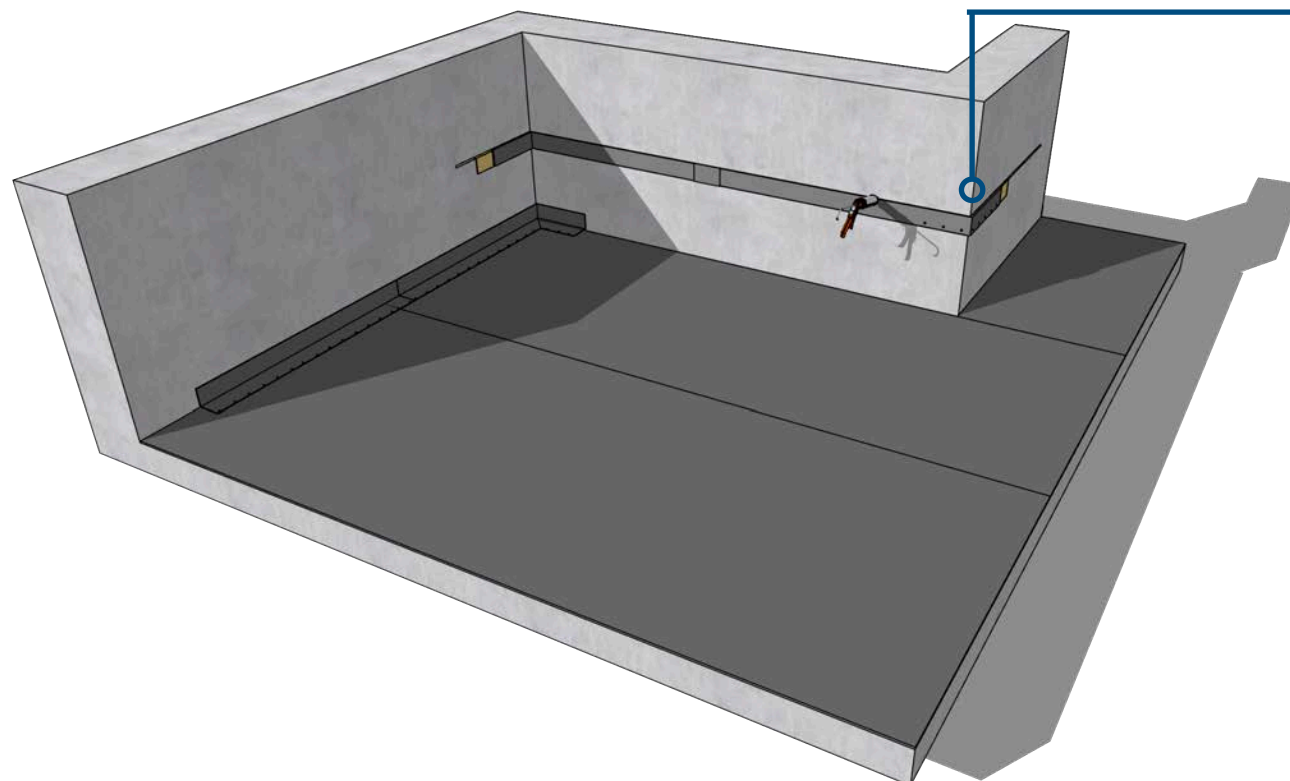
Once the approved primer has fully cured, apply a consistent bead of approved sealant into the saw cut reglet slot across the entire length of termination.

# VERTICAL UPTURN TERMINATION | CHASE DETAIL



6 |

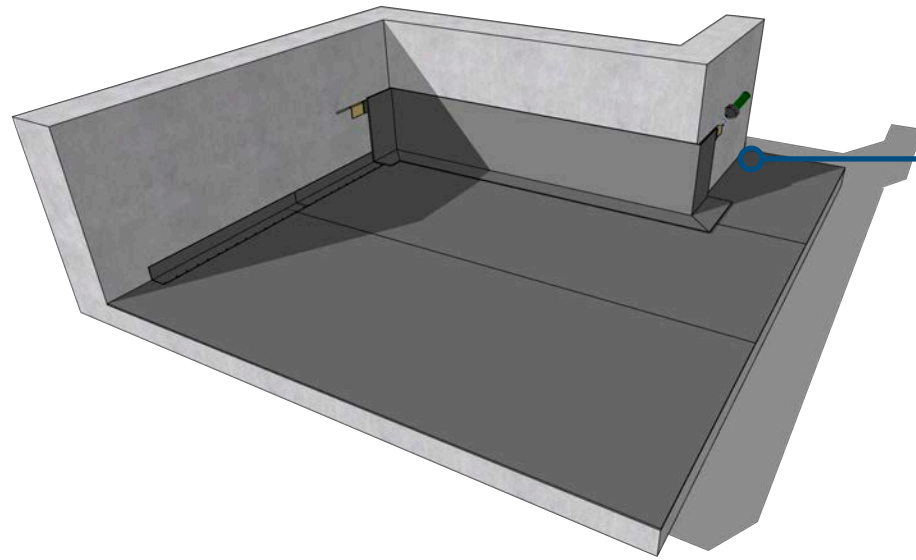
Fix Fatranyl chase termination approximately 10mm from the bottom edge and in the bottom third section of the Fatranyl angle at 150mm centres using Fatra approved fixings to secure into place. Ensure Fatranyl angles are sat flush against the wall and do not protrude off the surface.



7 |

Once the Fatranyl angle has been fully fixed, install a final bead of approved Fatra sealant across the top edge of the Fatranyl termination angle to fully seal the termination. Using a spray bottle and warm water, lightly spray the wet sealant and smooth off to achieve a consistent sealed joint.

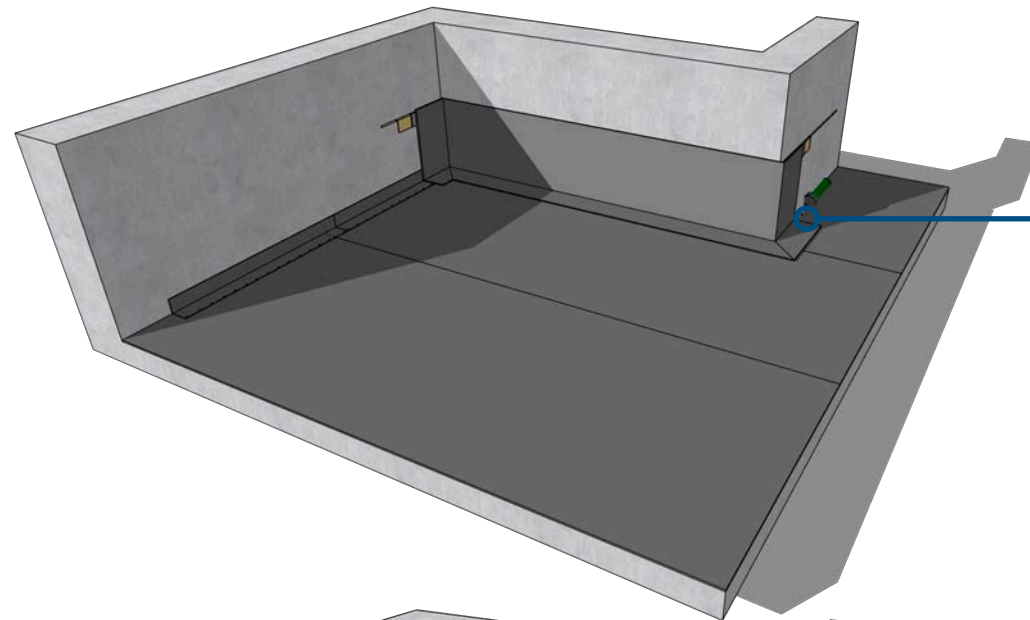
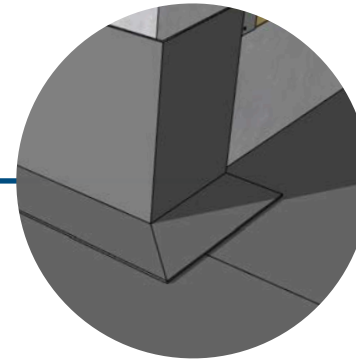
# VERTICAL UPTURN TERMINATION | PVC MEMBRANE STRAP



1 |

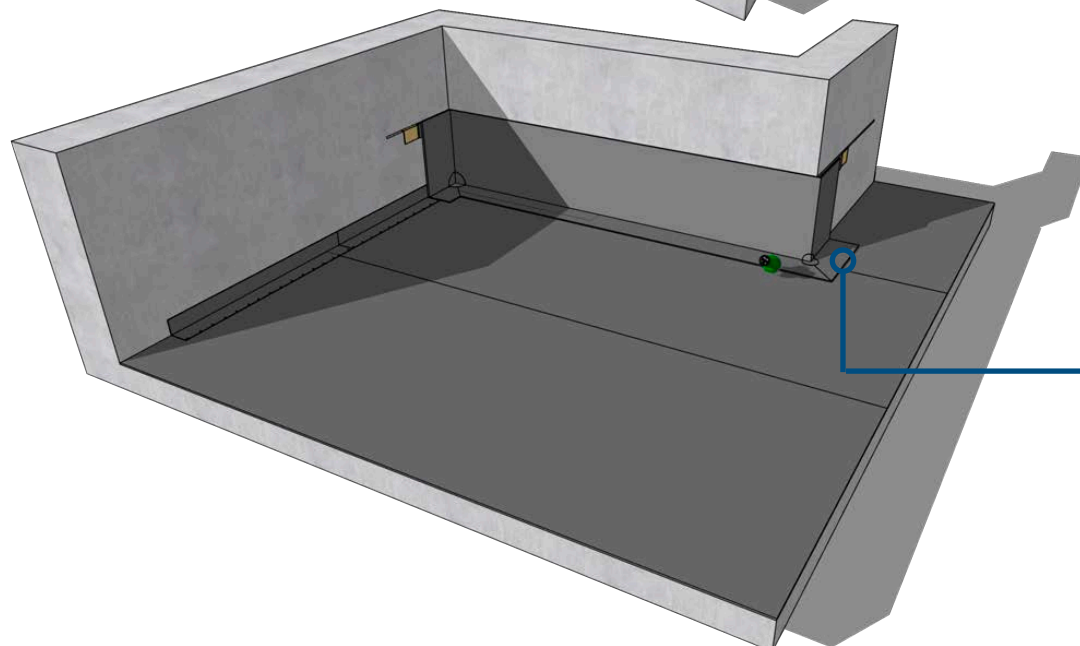
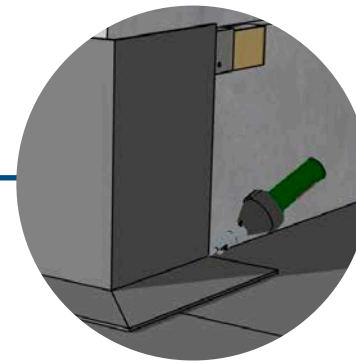
Once the Fatranyl chase termination angles have been installed a Fatrafol 810v reinforced membrane strap is installed to the vertical upturns.

Where a vertical chase termination has been implemented the Fatrafol 810v PVC strap is to be hot air fusion welded approximately 1mm from the top of the Fatranyl PVC coated chase termination achieving a continuous minimum weld width of 40mm along the entire length of the Fatranyl chase termination angle



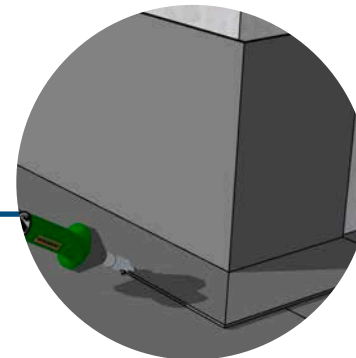
2 |

The Fatrafol PVC membrane strap will come down the inside vertical face, lapping over the Fatranyl internally coated PVC coated angle and 100mm onto the Fatrafol PVC field sheet membrane. A continuous weld is to be installed in the full width and length of the horizontal section of the Fatranyl internally coated PVC angle to ensure tenting of the vertical upturn membrane strap does not occur



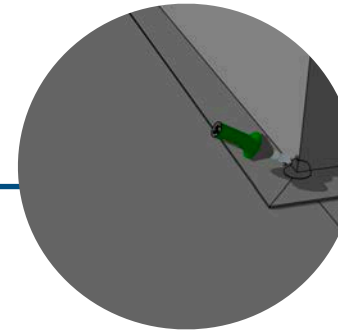
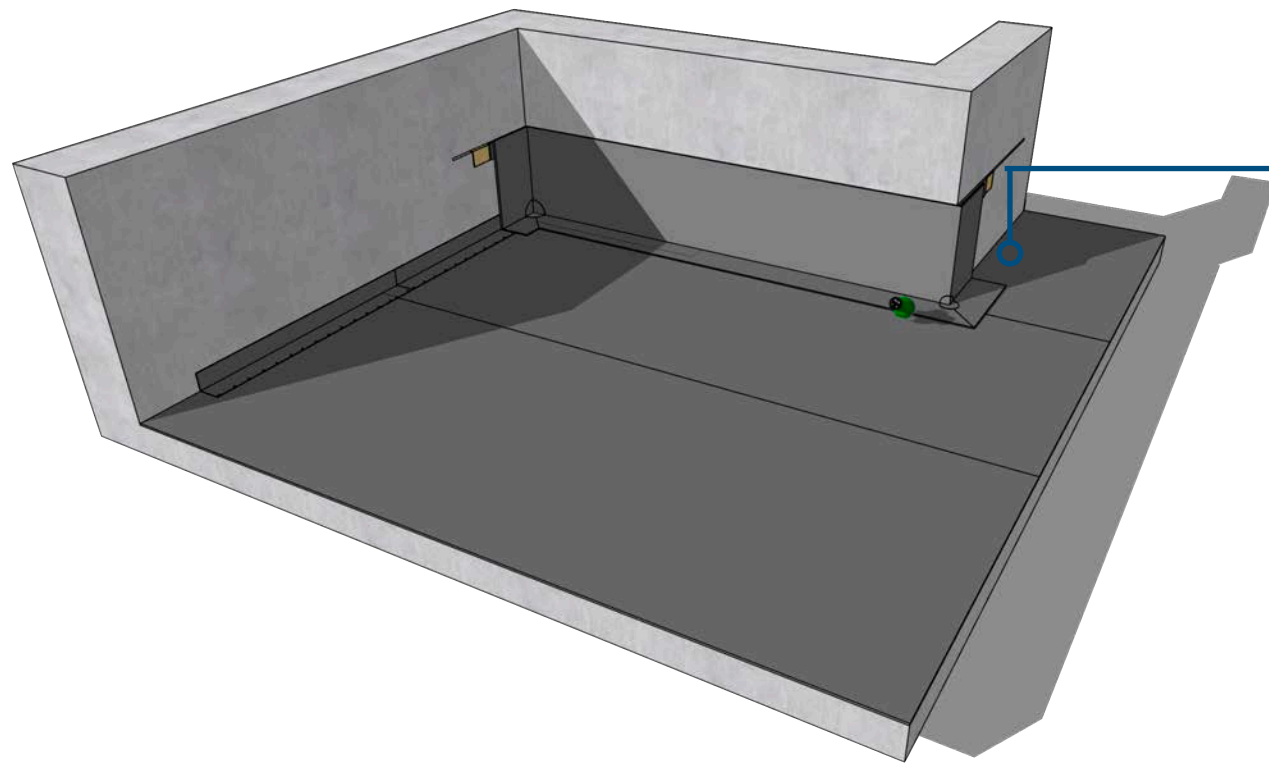
3 |

The Fatrafol 810v PVC membrane strap is then hot air fusion welded to the Fatrafol PVC field sheet membrane achieving a minimum weld width of 40mm, fully concealing the vertical upturn detail and providing a waterproofed finish. Once the welding process has been completed, ensure all welds are fully probed for any welding defects.





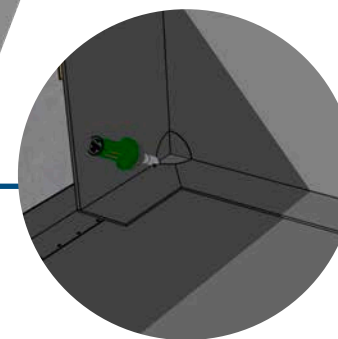
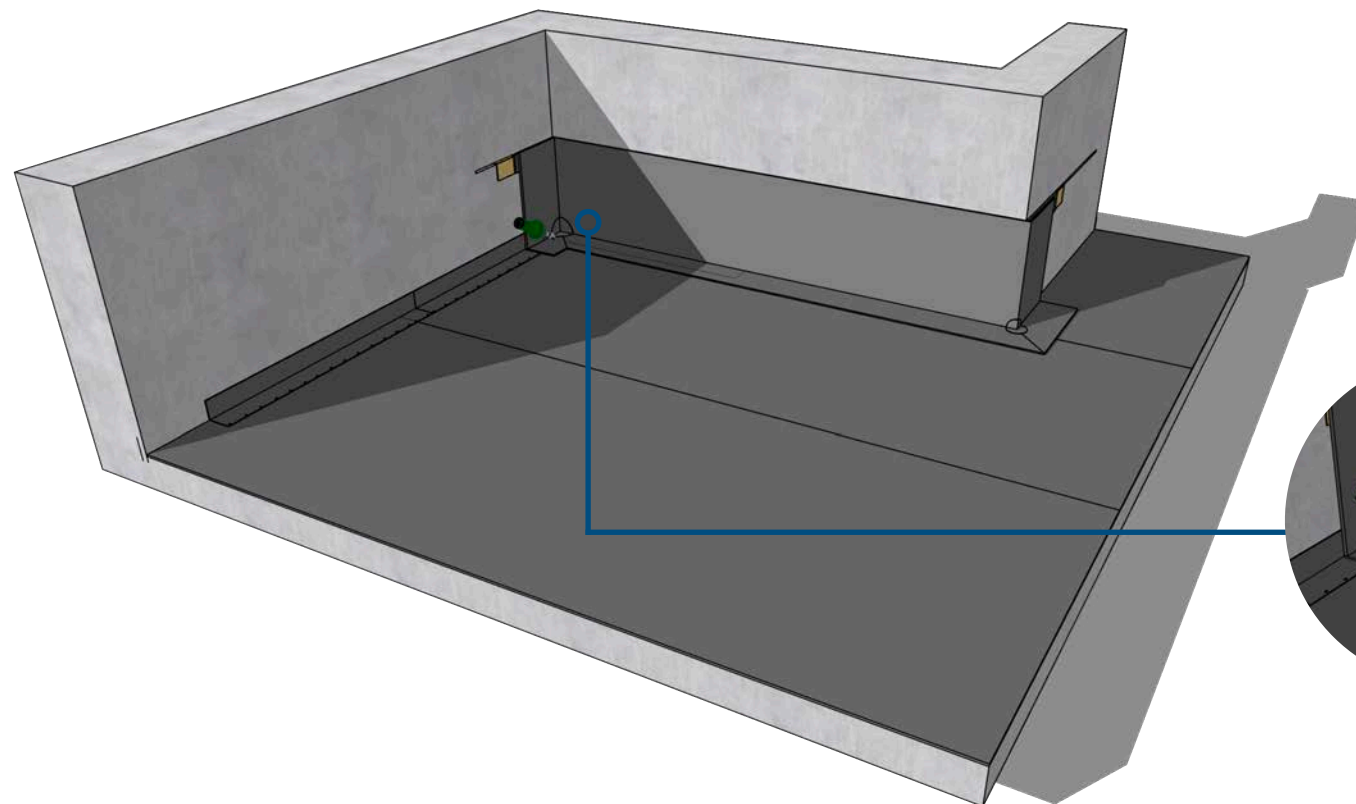
# VERTICAL UPTURN TERMINATION | CORNER PATCHES



1 |

Once the PVC membrane strap has been fully installed and welded, installation of external corner patches at the base of the outside corner junction is to be installed.

Hot air fusion weld around the entire perimeter of the external corner patch ensuring a consistent 40mm weld width is achieved to fully waterproof the junction.



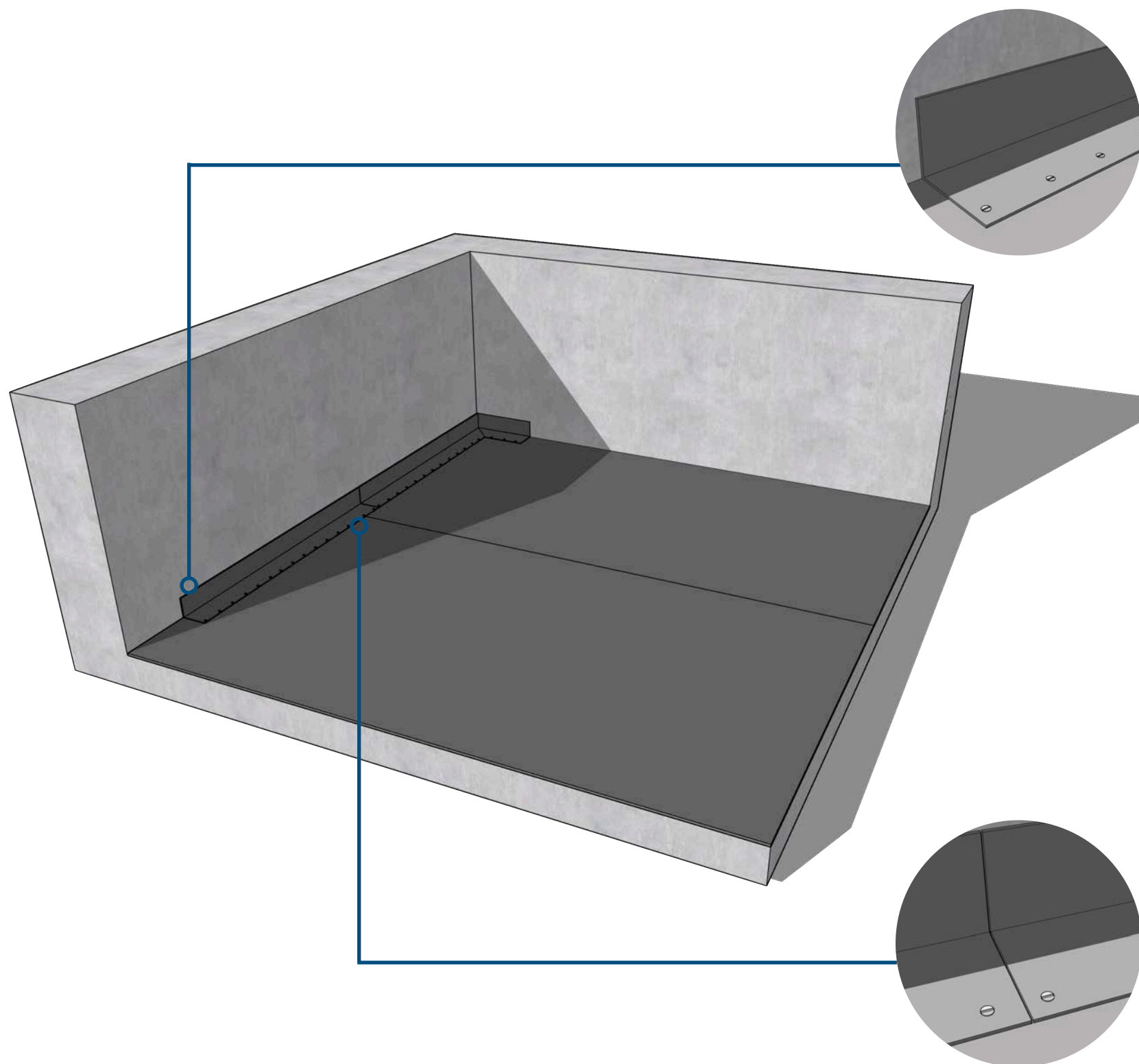
2 |

Once the PVC membrane strap has been fully installed and welded, installation of internal corner patches at the base of the inside corner junction is to be installed.

Hot air fusion weld around the entire perimeter of the internal corner patch ensuring a consistent 40mm weld width is achieved to fully waterproof the junction.



# PERIMETER HOB TERMINATION | INTERNAL PEEL STOP ANGLES



1 |

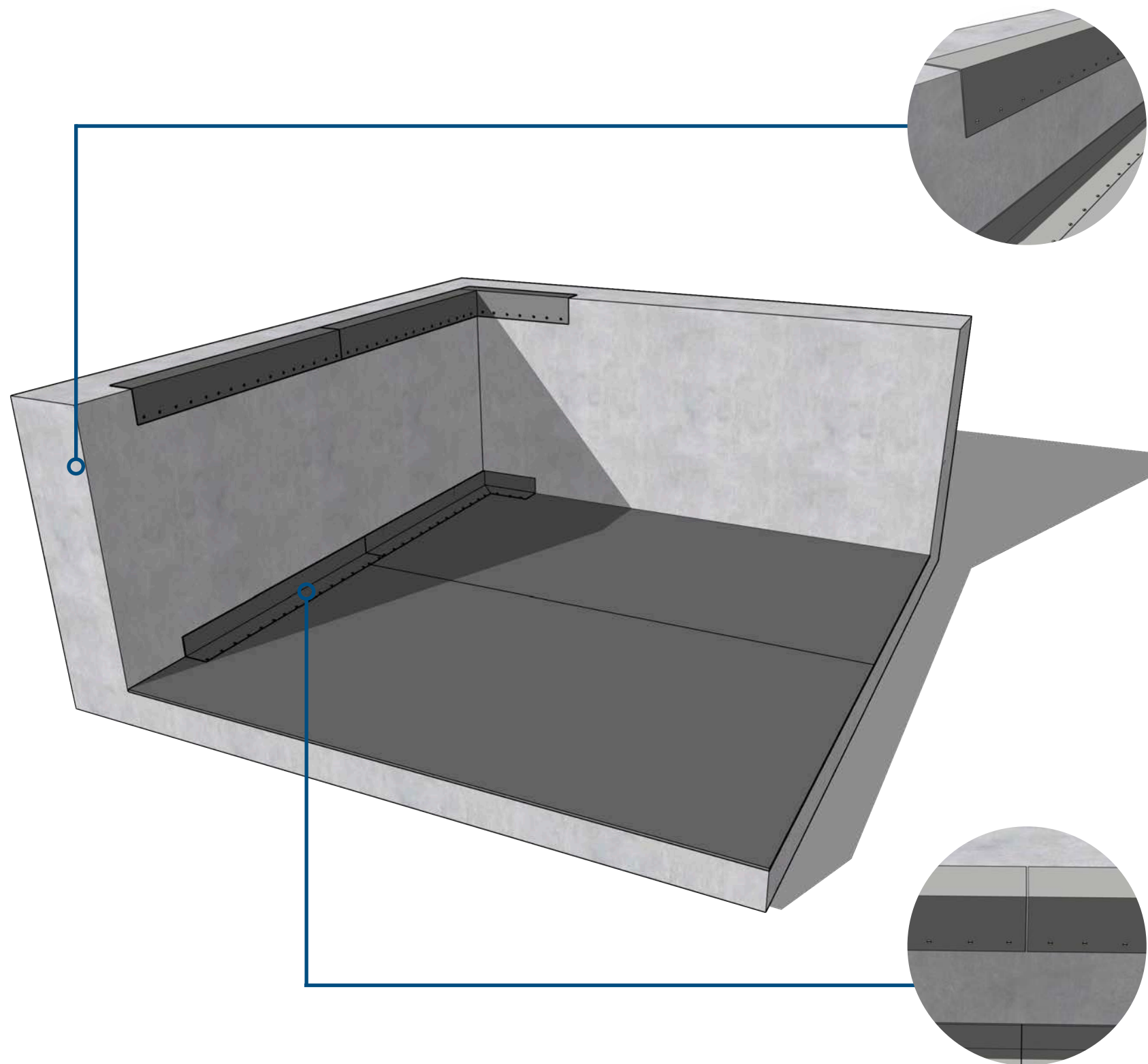
Once the field sheet has been fully installed, a Fatranyl internally coated PVC peel stop angle must be installed to all horizontal and vertical junctions. When installing Fatranyl internally coated angles, ensure the angles contour fully with the substrate and do not protrude off the surface.

The Fatranyl angle is mechanically anchored over the field sheet at 150mm centres using Fatra approved fixings into the substrate. The fixing locations must always be no closer than 10mm from the edge of the Fatranyl angle but always in the bottom third section to allow enough room to complete a hot air fusion weld when installing the PVC membrane strap.

2 |

All conjoining angles must have 2 - 5mm gap between each metal to allow for structural movement. The Fatranyl internally coated angle minimises shrinkage which may occur. Internally coated angles are to be installed to every horizontal and vertical junction and are to be fixed over the field sheet membrane at all times.

# PERIMETER HOB TERMINATION | EXTERNAL PVC ANGLES



1 |

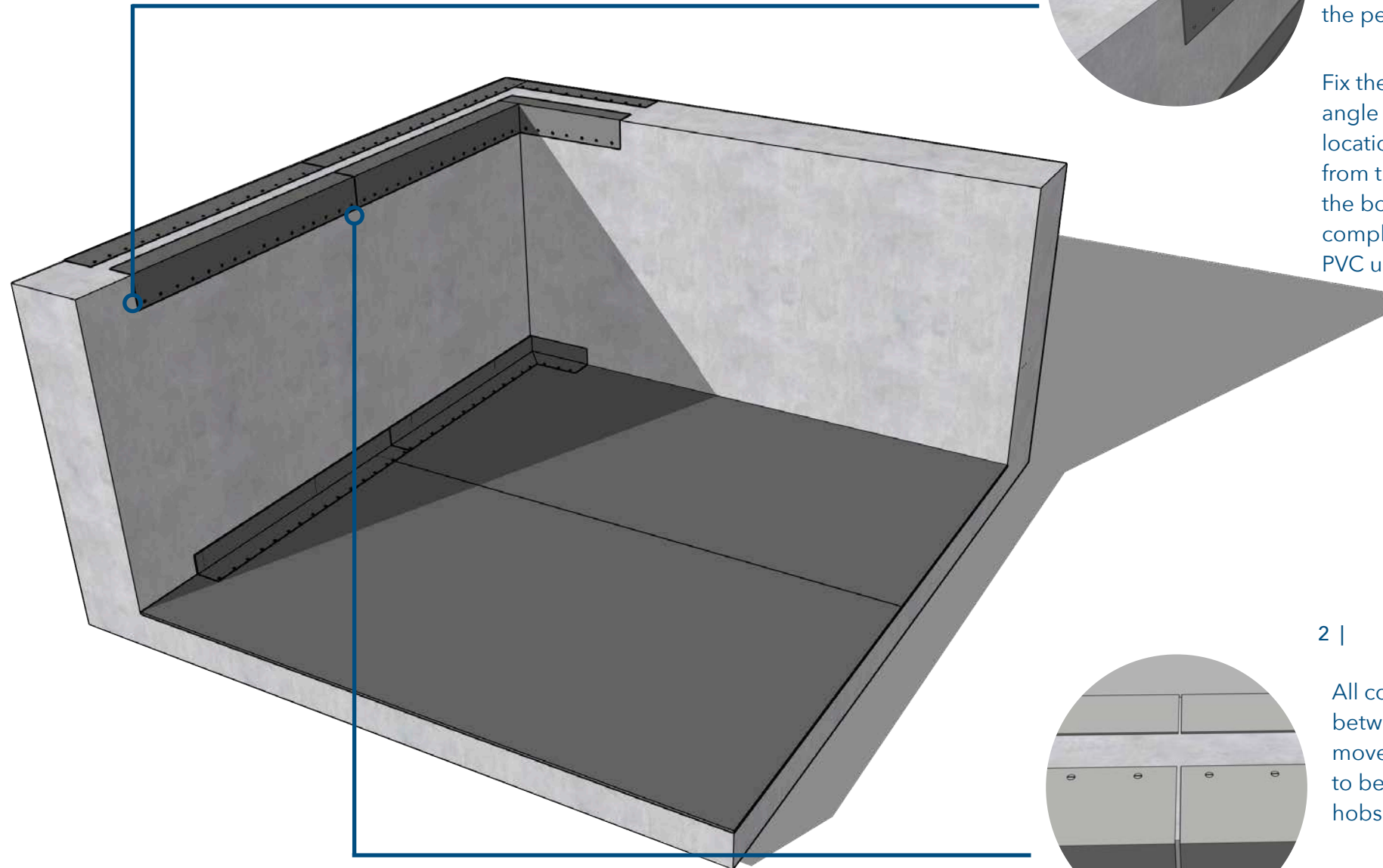
The Fatranyl external PVC coated angles are installed to the inside perimeter hob edge where the inside vertical face meets the top horizontal surface. Fatranyl external angle is used to protect the Fatrafol PVC membrane from the sharp edges that may be present on the corner of the perimeter hob which may result in the membrane defecting over time.

The Fatranyl angles are mechanically anchored at 150mm centres using Fatra approved fixings into the perimeter hob. The fixing locations must always be no closer than 10mm from the edge of the Fatranyl angle but always in the bottom third section to allow enough room to complete a hot air fusion weld when installing the PVC upturn membrane.

2 |

All conjoining angles must have 2 - 5mm gap between each metal to allow for structural movement. The Fatranyl externally coated angles are to be installed to the entire length of the perimeter hobs.

# PERIMETER HOB TERMINATION | CRUSH & FOLD PVC ANGLES



1 |

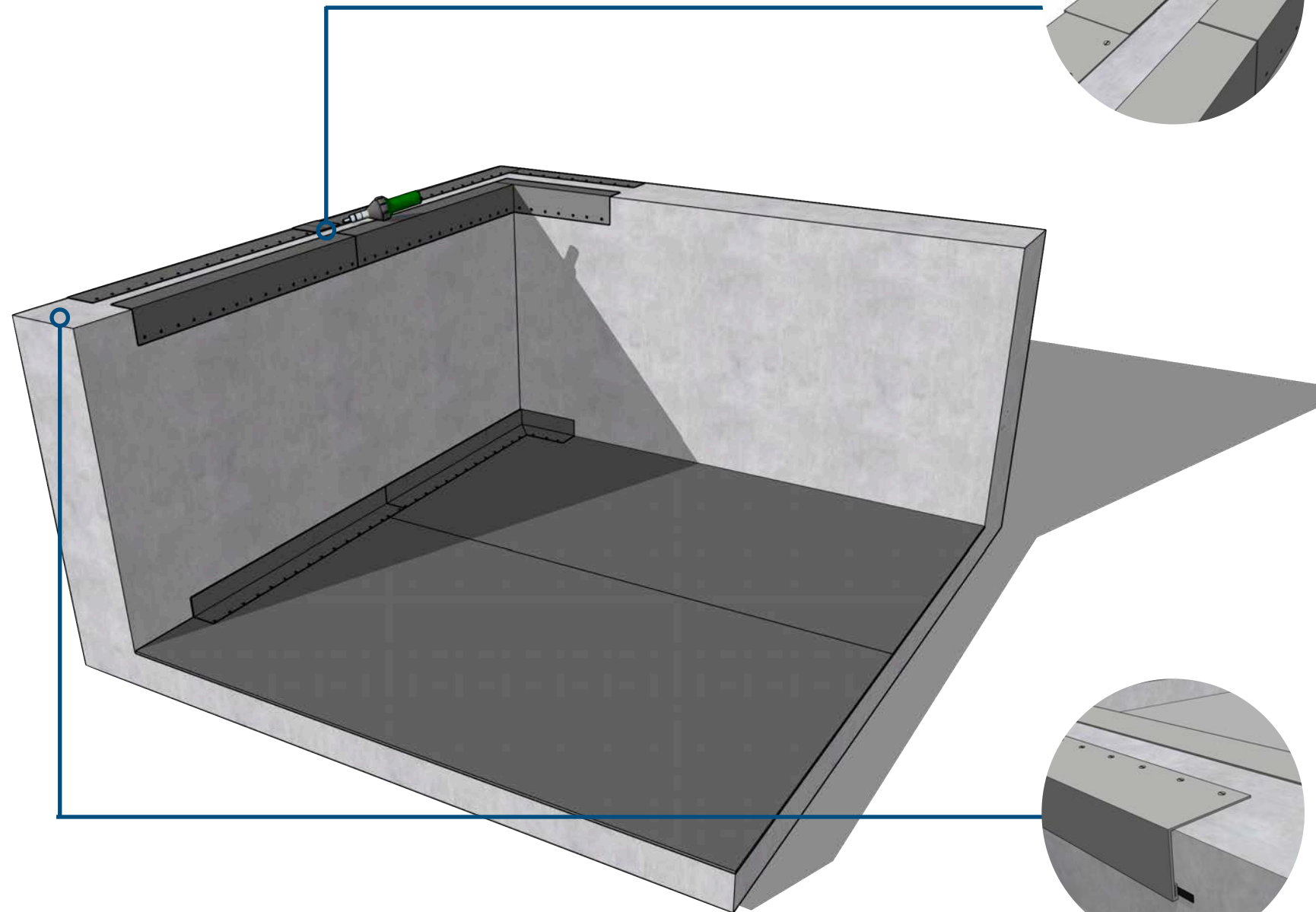
The Fatranyl crush & fold PVC coated angles are installed to the outside perimeter hob edge. Fatranyl crush & fold angle is used to terminate the Fatrafol PVC membrane system and protect the perimeter hob from water ingress.

Fix the horizontal section of the crush and fold angle which sits on top of the hob. The fixing locations must always be no closer than 10mm from the edge of the Fatranyl angle but always in the bottom third section to allow enough room to complete a hot air fusion weld when installing the PVC upturn membrane.

2 |

All conjoining angles must have 2 - 5mm gap between each metal to allow for structural movement. The Fatranyl crush and fold angles are to be installed to the entire length of the perimeter hobs.

# PERIMETER HOB TERMINATION | CRUSH & FOLD PVC ANGLES



3 |

Once these have been fixed into place, a Fatrafol 804 detailing membrane butt strap must be hot air fusion welded over the expansion gaps of the conjoining metals. This is to be installed to the top horizontal face running down the outside vertical face and slightly underneath the externally coated PVC crush and fold angle to completely waterproof the joints. A minimum 40mm weld is to be achieved around the entire perimeter of the butt strap with the exception of the underside section. The butt strap is not to be fully welded to the outside face underside of the butt strap to ensure the butt strap does not tear or damage when exposed to structural movement.

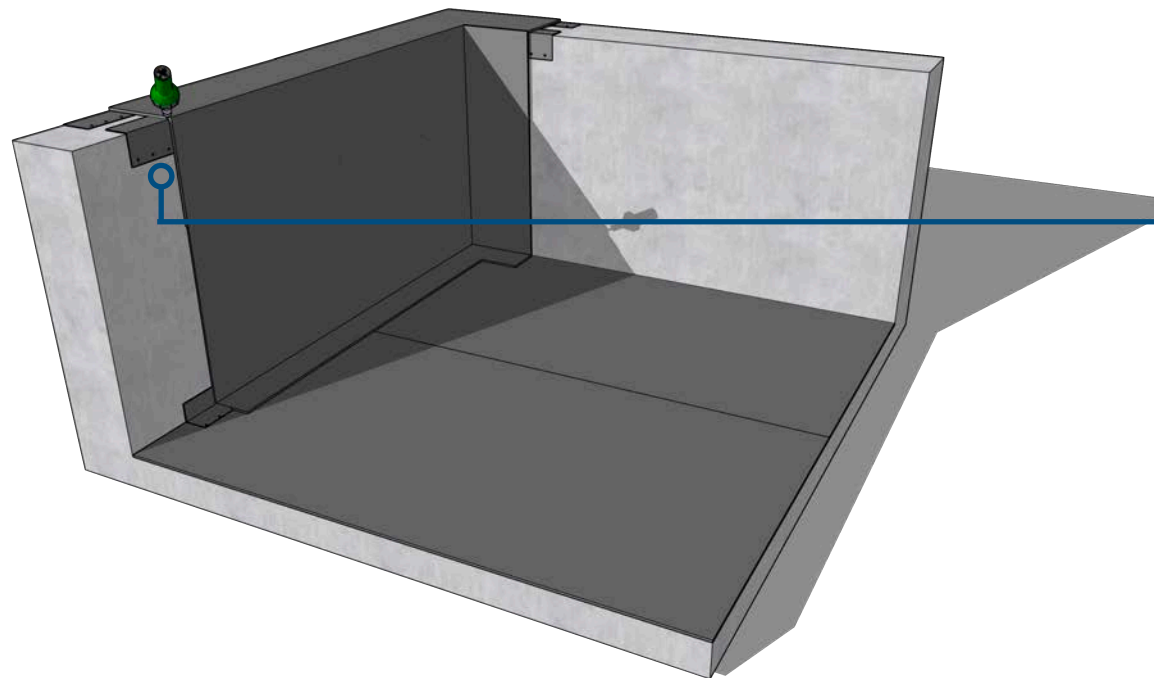
4 |

Any Fatranyl crush and fold termination angles must be sealed against the outside vertical face of the building using Fatra butyl sealing tape to air seal the termination and avoid corrosion.

Fixing of the outside vertical face or installing a ledger support angle maybe required to suitably secure the Fatranyl angle and prevent the Fatranyl angle being dislodged or damaged when exposed to high winds. Consultation with a Fatra technical representative and approved engineered is advised prior to implementing this detail.

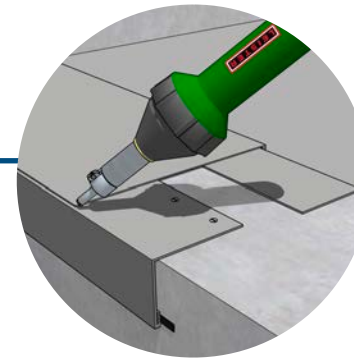


# PERIMETER HOB TERMINATION | PVC MEMBRANE STRAP

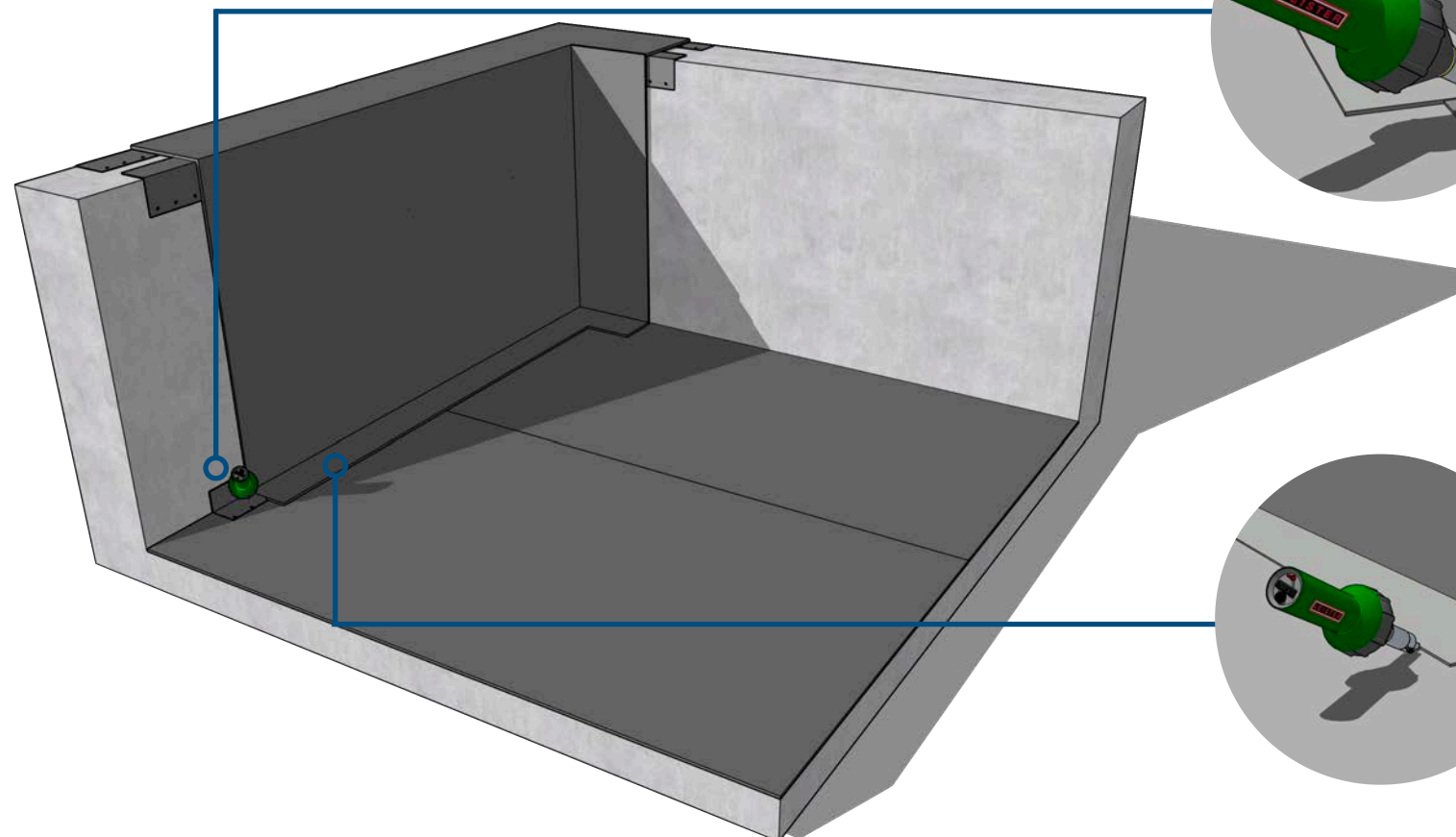


1 |

Once the Fatranyl crush & fold termination angles have been installed a Fatrafol 810v reinforced membrane strap is installed to encapsulate the perimeter hob.

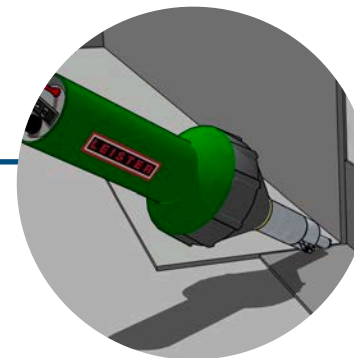


Where the Fatranyl angle has been implemented a Fatrafol 810v PVC strap is to be hot air fusion welded approximately 1mm from the outside edge of the Fatranyl PVC coated crush & fold termination angle achieving a continuous minimum weld width of 40mm along the entire length of the Fatranyl angle



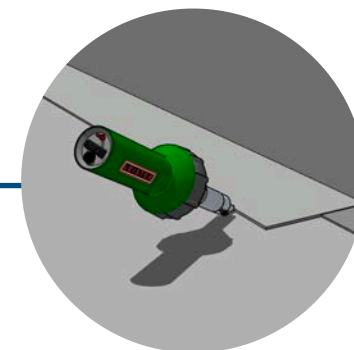
2 |

The Fatrafol PVC membrane strap will come across the top horizontal surface of the hob and down the inside vertical face, lapping over the Fatranyl internally coated PVC coated angle and 100mm onto the Fatrafol PVC field sheet membrane. A continuous weld is to be installed in the full width and length of the horizontal section of the Fatranyl internally coated PVC angle to ensure tenting of the vertical upturn membrane strap does not occur.

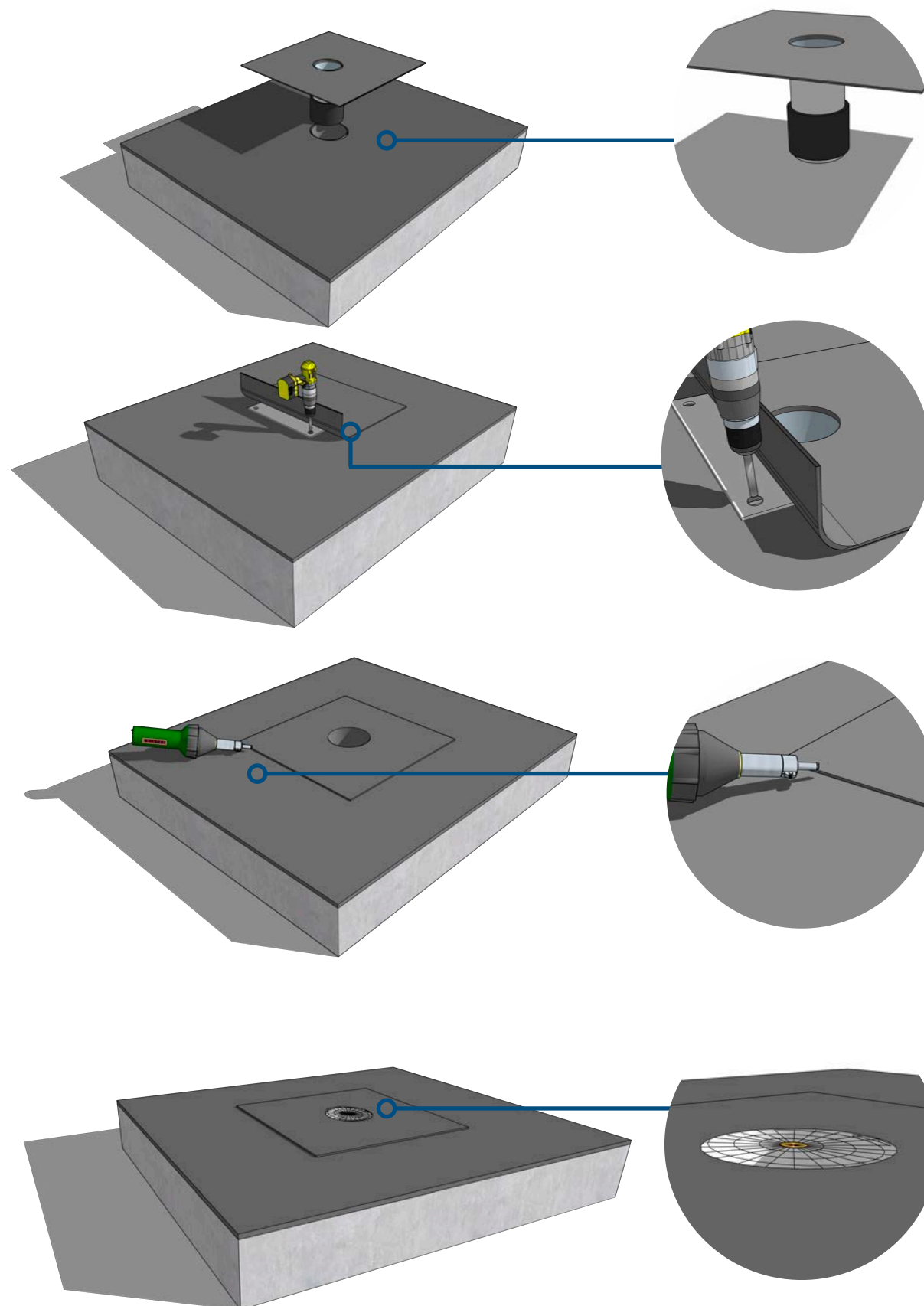


3 |

The Fatrafol 810v PVC membrane strap is then hot air fusion welded to the Fatrafol PVC field sheet membrane achieving a minimum weld width of 40mm, fully concealing the vertical upturn detail and providing a waterproofed finish. Once the welding process has been completed, ensure all welds are fully probed for any welding defects.



# RAINWATER | FLOOR OUTLET DETAILING



1 |

Fatra prefabricated rainwater outlets come in various different outlet diameters.

Each outlet comes with a backflow flange to prevent water getting behind the integrated PVC pipe and under the waterproofing membrane system. Using the correct diameter of rainwater outlet, insert the into the drain. Ensure the outlet is recessed slightly so the Fatra ancillary does not protrude above the finish floor level and prevent full drainage into the outlet.

2 |

The Fatra rainwater outlet is fixed in all four corners using Fatra approved fixings to secure into place. Fixing of the outlet prevents the ancillary becoming dislodged or damaged in the event of severe pressure from back flowing.

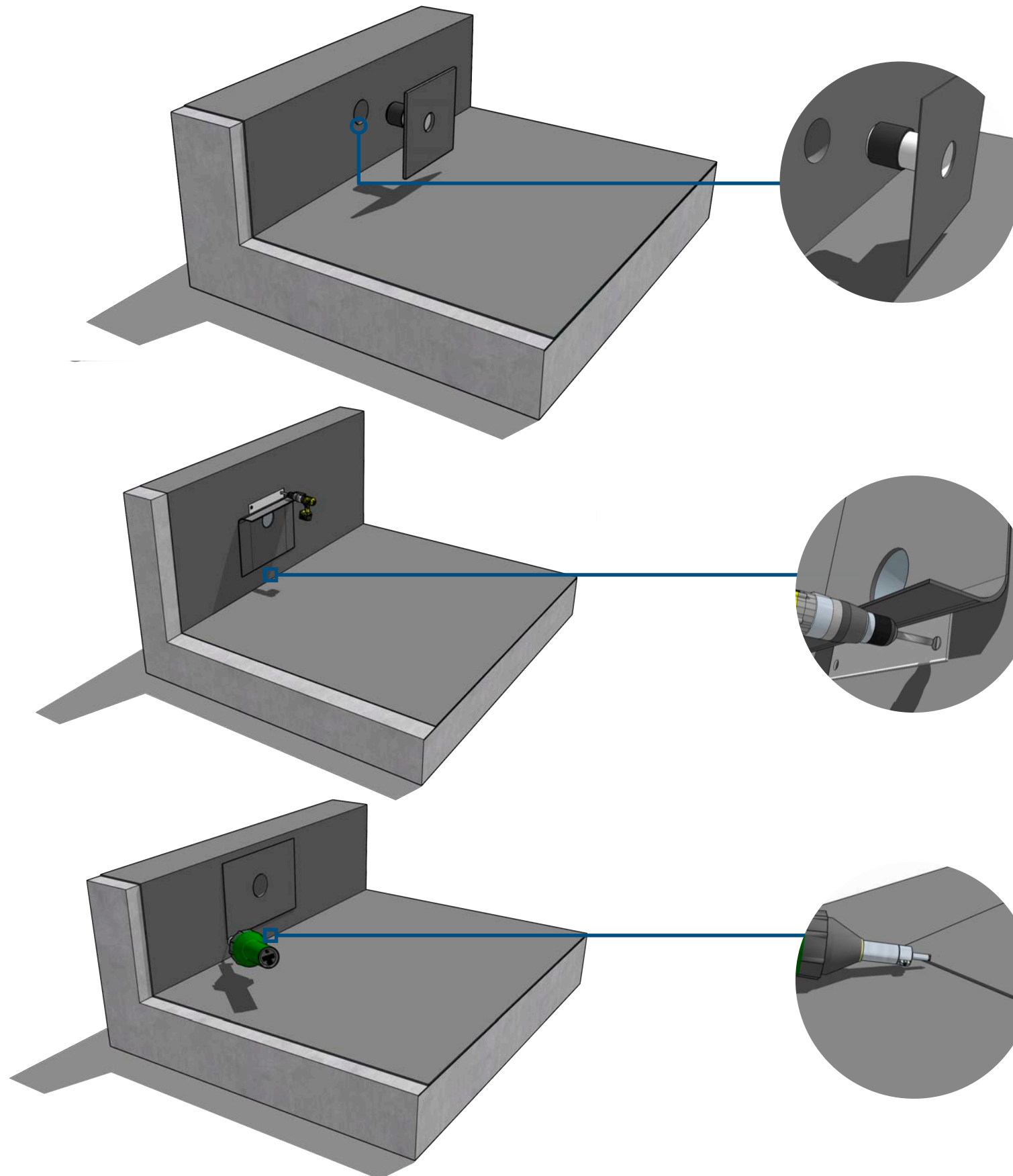
3 |

Once fixed into place the integrated PVC membrane flange is hot air fusion welded around the entire perimeter of the outlet to the Fatrafol PVC field sheet membrane archiving a minimum weld width of 40mm. Once the welding has been completed, adjustable leaf guards can simply be slotted into the outlet and adjusted to attach to the prefabricated rainwater outlet and secured into place.

4 |

Insert Fatra leaf guard into outlet and ensure to install as per manufacturers directions.

# RAINWATER | OVERFLOW DETAILING



1 |

Fatra prefabricated rainwater overflows come in various different outlet diameters.

Each outlet comes with a backflow flange to prevent water getting behind the integrated PVC pipe and under the waterproofing membrane system. Using the correct diameter of rainwater overflow, insert the into the wall overflow.

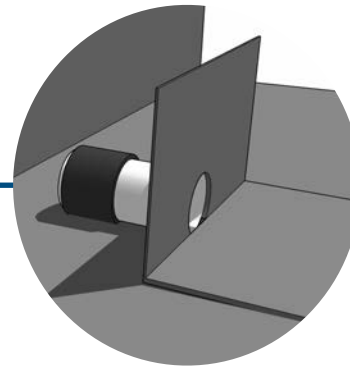
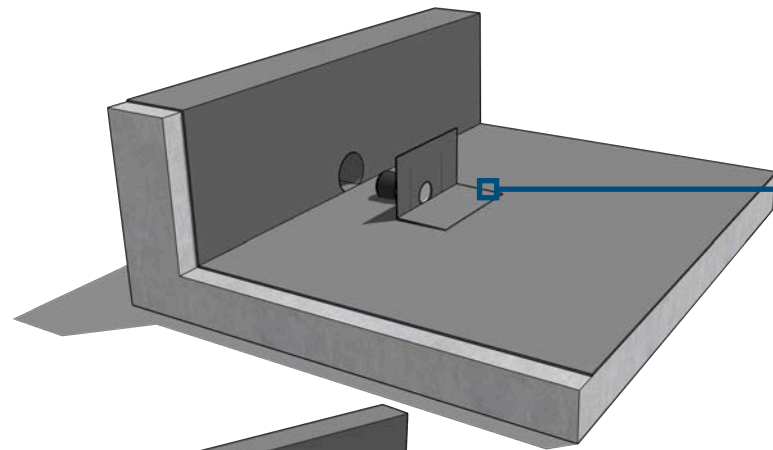
2 |

The Fatra rainwater overflow is fixed in all four corners using Fatra approved fixings to secure into place. Fixing of the overflow prevents the ancillary becoming dislodged or damaged in the event of severe pressure.

3 |

Once fixed into place the integrated PVC membrane flange is hot air fusion welded around the entire perimeter of the outlet to the Fatrafol PVC sheet membrane archiving a minimum weld width of 40mm.

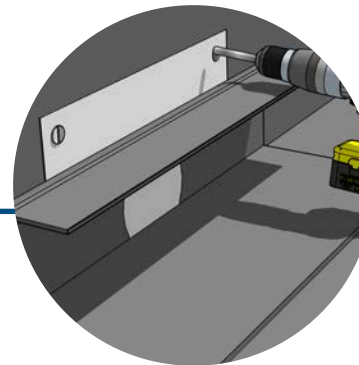
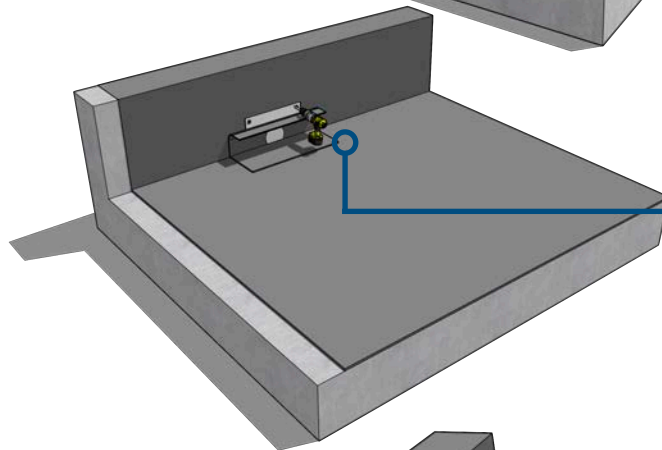
# RAINWATER | WALL OUTLET



1 |

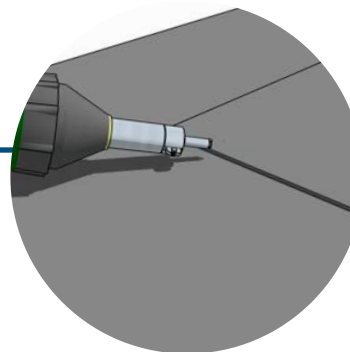
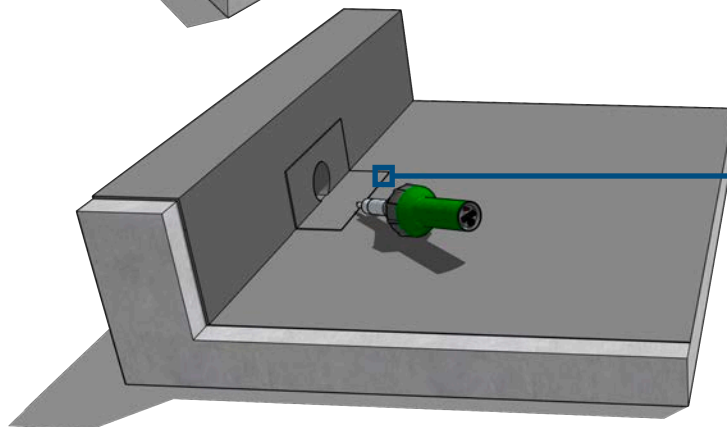
Fatra prefabricated rainwater outlet come in various different outlet diameters.

Each outlet comes with a backflow flange to prevent water getting behind the integrated PVC pipe and under the waterproofing membrane system. Using the correct diameter of rainwater outlet, insert the into the wall outlet.



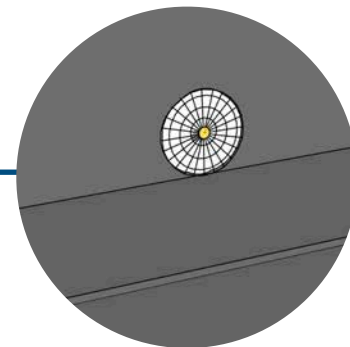
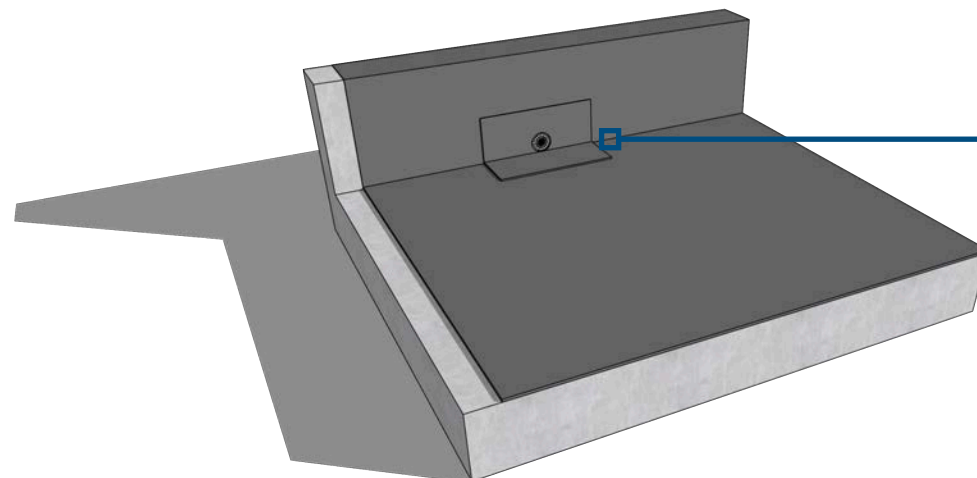
2 |

The Fatra rainwater overflow is fixed in all four corners using Fatra approved fixings to secure into place. Fixing of the overflow prevents the ancillary becoming dislodged or damaged in the event of sever pressure.



3 |

Once fixed into place the integrated PVC membrane flange is hot air fusion welded around the entire perimeter of the outlet to the Fatrafol PVC sheet membrane archiving a minimum weld width of 40mm.

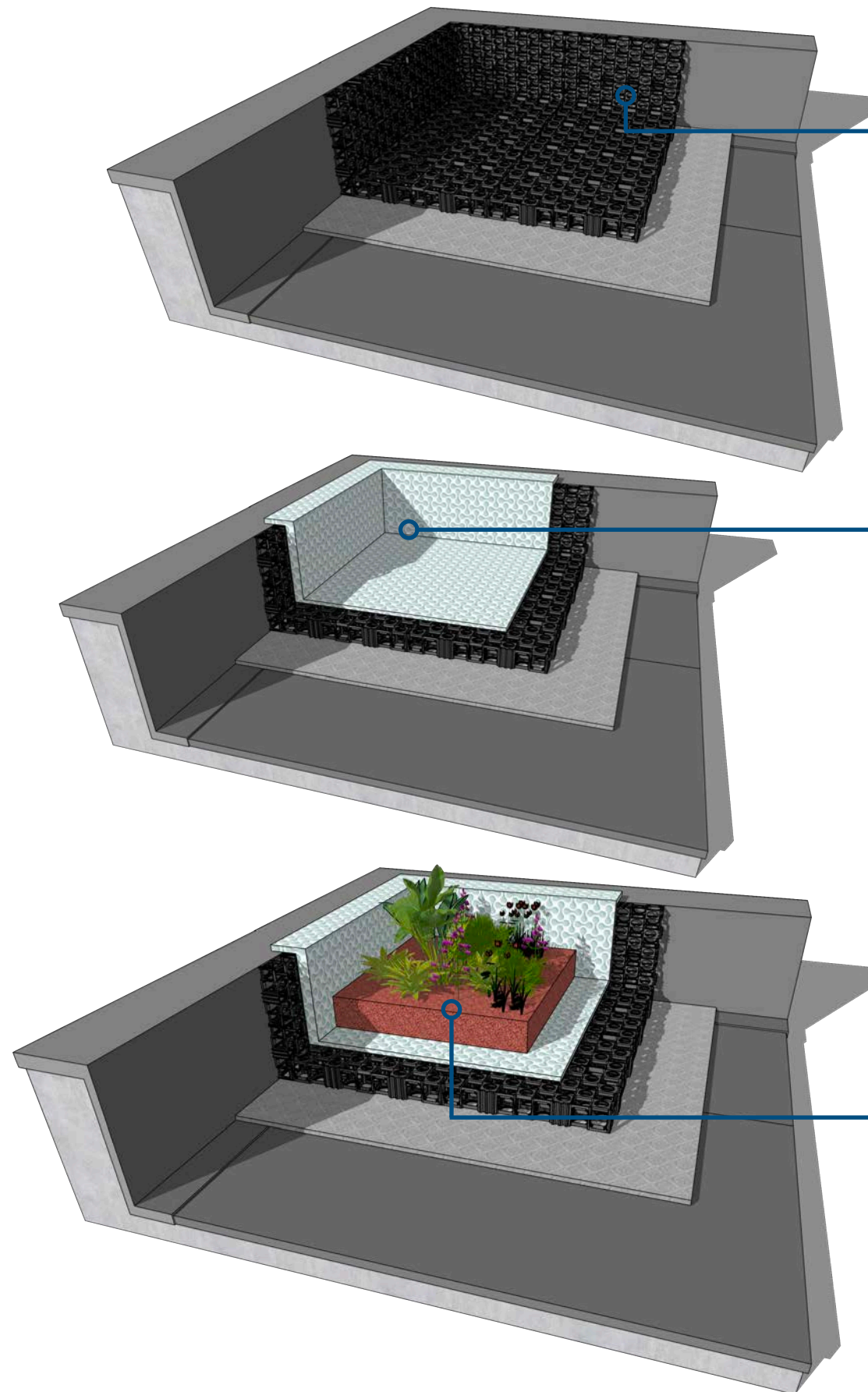


4 |

Insert Fatra leaf guard into outlet and ensure to install as per manufacturers directions.



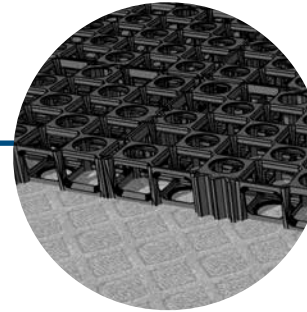
# OVERLAYING FINISHES | GREEN ROOF



1 |

Lay Fatra Armour Protection Mat over the PVC membrane to provide protection from the drainage cell. Ensure conjoining sheets lap over one another to avoid any gaps in the Fatra Armour.

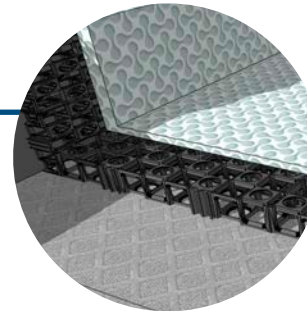
Install drainage cell over the protection layer in accordance with Fatra and architectural specifications. Ensure Drainage cell is installed to all vertical upturns in accordance with the relevant Australia Standard and suppliers recommendations.



2 |

Once the drainage cell has been completed, loose lay a filter fabric over the drainage cell ensuring a 100mm overlap on conjoining sheets. Ensure filter fabric is lapped up and over the vertical drainage cell.

This aspect maybe completed by a different contractor such as the landscaper.



3 |

Once the filter fabric has been installed, the vegetation (soil, plants etc) is installed over the top. Ensure the level of soil/plants is 100mm below the termination of the PVC membrane system.

This aspect maybe completed by a different contractor such as the landscaper.



# HOT AIR FUSION | Welding

## HAND | Welding



When installing a membrane covering, the key task is to make entirely watertight and firm joints between waterproofing membrane sheets, membranes and linear plastic-coated metal profiles at the perimeter, and between membranes and accessories (rainwater outlets, vent outlets etc) in order to create a single unit. Two technologies are available to make these structural joints:

This method is based on the so-called fusion welding, which involves heat-melting contact surfaces of membrane overlaps and their simultaneous compression. This is achieved by hot air flowing out of a slot nozzle of a welding machine with continuous temperature control. Move the welding machine gently in the direction of an open joint (with the slot nozzle projecting 3 to 5 mm over the upper membrane edge). Heated contact surfaces must be pressed down immediately behind the nozzle, using a rubber or Teflon roller.

This joining method may be used at temperatures from -5°C for PVC-P/-10°C

## AUTOMATIC | Welding



This method is similar to hot-air welding, differing only in that the welded surfaces are heated by thermal transfer from a wedge welder. Heated contact surfaces must be pressed down immediately behind the wedge welder, using a roller. This system is used only for automatic welding machines and is suitable for materials with lower thermal oxidation stability.

If a proper working process is followed, both methods can create joints with shear resistance of at least 80% of the waterproofing membrane shear resistance indicated by the manufacturer. Hot-air welding must be considered the primary method of joining FATRAFOL membranes. Membrane sheets are welded at their overlaps. If using a hand-operated welding machine, the weld must be at least 30 mm wide. Most automatic welding machines have a 40 mm wide welding nozzle.

Where membrane sheets are fastened mechanically, fixing washers must be positioned at least 10 mm from the edge of the lower fastened membrane sheet. The overlap of the upper membrane sheet behind the washer must be 10 mm greater than the weld width – see figure 7. Oval washers must always be aligned lengthwise with the joint axis. Hot-air welding may be performed using a hand-operated welding machine or an automatic welding machine <sup>1)</sup>, subject to adherence to this Instructions and applicable standards

## HAND | Tools



- Hot-air welding machine with 40 mm and 20 mm wide slot nozzle
- Hot-air mobile automatic welding machine (recommended type: LEISTER VARIMAT, HERZ – Laron etc)
- Impact drill with set of drill bits for concrete and other materials
- Water extractor
- Vacuum pump and bells for vacuum tightness test
- Cordless screwdriver
- Angle grinder with metal cutting disc
- Other electrical equipment and devices such as automatic fastening machines, sealing guns, PU adhesive applicators etc
- Electrical extension cord
- Tension meter
- Folding ruler
- Steel ruler
- Greasy chalk
- Carpenter's pencil
- Knife with hook
- Scissors
- Membrane cutting pad
- Handheld rubber and teflon rollers
- Pressing roller (if membrane is bonded to substrate)
- Brass brush for cleaning slot nozzles
- Hammer Rivet pliers
- Sealant cartridge gun
- Joint testing needle
- PE bottles with delivery tube
- Steel cutter
- Cleaning cloths
- Flat and crosshead screwdrivers
- Rubber spatulas for cleaning membrane surface
- Hacksaw
- Sponges for removing puddles
- Hand metal shears
- PE waste bags
- Broom
- Spatulas for sealant
- Dustpan

# TESTING | PROCEDURES

## PEEL | Testing

All surfaces that are being welded must be clean of any dirt, debris or moisture before welding. Before commencing the installation test samples must be carried out to determine that the temperature and speed of welding is correct. These will vary depending on the membrane types and the welders technique and skill level. A peel test must be carried out to establish the correct heat and speed of the hot air fusion welding. This consists of using two small strips of membrane that has been welded at the seam. Pull away the upper strip of membrane to test the weld strength. If the seam separates the welding method is inadequate or the membrane is not in a condition to be welded. If tearing occurs it should be outside the seam weld either within the layer of reinforcement or in the synthetic sheeting.

## SEAM | Probe Testing

Use a testing probe to check all types of welds (continuous and detail welds including T- joints) no earlier than 1 hour after welding. A testing needle used for this test is usually included in the welder's essential kit and delivered by the welding equipment manufacturer (Leister, Herz etc). Drive the needle in the direction of the weld axis and apply gentle side pressure on the joint to easily detect any non-welded or separated points in the weld. This test should be performed before securing the welds with a joint sealant for roofs with a stabilisation layer, inverted roofs, traffic roofs, green roofs and in all places where the waterproofing layer is to be covered with another layer.

## ELECTRONIC | Leak Detection

Electronic leak detection method can be used to test the membrane and establish if moisture is penetrating the membrane and grounding through the substrate. This can be completed by either a dry or wet testing method depending on the specific details on site. The test procedure is a non intrusive method of leak detection and is a highly accurate method of leak detection. Wet testing procedures is done by applying water over the membrane surface and using the water and a conductive medium where an electronic field is created to trace a beach in waterproofing system.

The test procedure is also a non intrusive or destructive method of leak detection and pin points the source of the leak without having to flood the membrane. This method is used to establish if moisture is penetrating the membrane and grounding through the substrate.

## SUBMERSION | Testing

Testing of water-tightness - may to some extent be used for this test. The use of this method is limited by roof deck specifications, in particular the permissible load of the load-bearing structure, maximum water level and the roof deck area. Typically, roof decks up to 100 m<sup>2</sup> in area are covered with a continuous water layer while larger roofs are only partly covered, e.g. in valleys between roof planes or in individual tested sectors. The maximum water column height should be determined by a structural engineer, with consideration being given to dynamic load of the roof deck.

## MAINTENANCE |

Regular cleaning and clearing of leaves and any other debris is recommended for drainage and any other outlets within the structure to avoid build up and clogging of these areas. Visual checks should also be carried out for any damage caused by excessive weather or environmental damage such as fallen branches, hail etc.

Fatra can provide annual maintenance surveys of the area and issue a full report. This will give you assurance that the system is still performing at its optimum efficiency and is a proactive way of ensuring there is no damage or potential issues that could affect the integrity of the membrane. Contact Fatra for more details on how we can provide a suitable maintenance plan for the area.

## INSPECTIONS |

A Fatra field technician is to attend at the start of the project to ensure all parties have read and understood the specification and requirements. Upon completion of the installation, a Fatra technician is to attend and carry out a project completion guide to inspect prior to issuing warranties. Once the inspection has been completed and any defects or rectifications have been completed, a final inspection will be carried out to enable the issuing of material warranties.

## WARRANTY |

Depending on what system is implemented Fatra can provide material warranties from 15 years to 25 years. A material warranty will only be issued once a Fatra field technician has inspected and passed the installation of the Fatra waterproofing system. All warranties are issued directly to the client.

## QUALITY CONTROL |

Fatra systems are ISO 9001 & ISO 14001 accredited

Fatra to provide on going support with design and installation to ensure the most efficient system is implemented based on site specific details

Fatra to provide all relevant information and documentation

Applicator must have relevant licences and insurances to carry out the works in hand

Contractor are to be an approved Fatra applicator

## SUBMISSIONS |

Fatra to attend site prior to commencing work and establish all necessary requirements

Fatra to provide technical data sheets, detail drawings of termination, specification and any other relevant documentation prior to commencing onsite.

Client to provide site specific section drawings for all details on each project to enable Fatra to provide detailing drawings for these sections.

## MATERIALS |

Materials are to be stored in a safe location and avoid being exposed to the elements or other damage such as mechanical etc.

Fatra to provide a signed document prior to delivering materials to site clarifying that all materials are fit for purpose.



FATRA AUSTRALIA | Pty Ltd

ADDRESS | 1D 10 Childs Road Chipping Norton NSW 2170

WEBSITE | [www.fatraaustralia.com.au](http://www.fatraaustralia.com.au)

EMAIL | [info@fatraaustralia.com.au](mailto:info@fatraaustralia.com.au)

TELEPHONE | 0297 232 048