



Technical Specification

Below Ground OSD Tank PVC Membrane System

SPECIFICATION | Content

PAGE 3 | Proposed System

PAGE 4 | Metal Ancillaries

PAGE 5 | Accessories

PAGE 6 | System Benefits & Accreditations

PAGE 7 | Preparation and Storage

PAGE 8 | Installation Procedures

PAGE 20 | Hot Air Fusion Welding

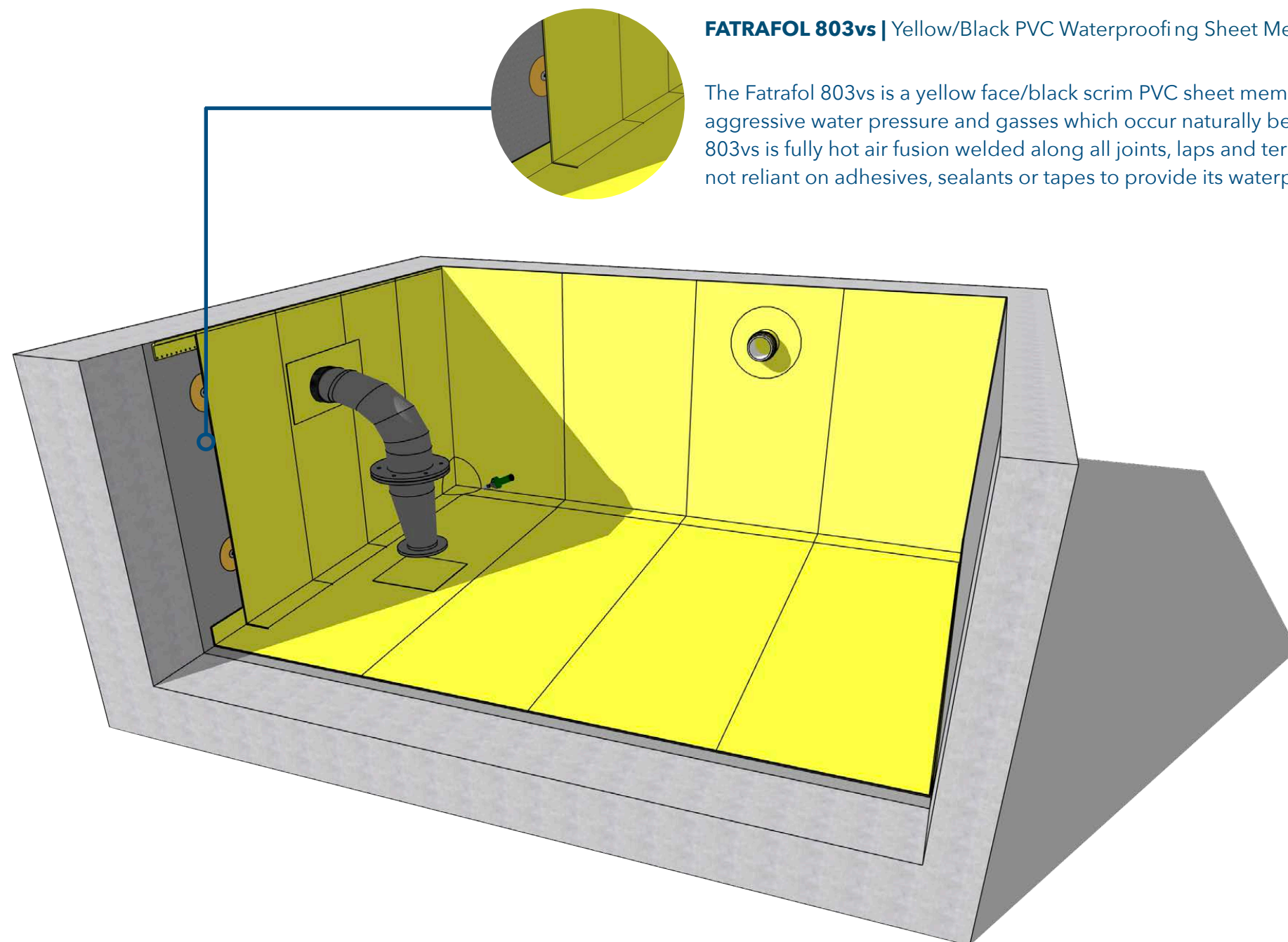
PAGE 21 | Testing Procedures

PROPOSED | System

The Fatra retention tank system provides unrivalled performance when installed in a water storage tank environment. The Fatrafol 803vs is designed to create a full bladder system and can withstand continuous stagnant water without failing or delaminating prematurely.

The Fatrafol 803vs is designed to withstand aggressive water pressure, hydrostatic pressure and creates a radon barrier to prevent the natural gases that are present below ground from entering the building foundations. The Fatrafol 803vs is made with a black scrim below and a top yellow signal layer to enable contractors to easily identify any breaches in the membrane. If the yellow top layer is damaged the black scrim layer below shows through making any defects easy to spot and patch repair prior to filling the retention tank.

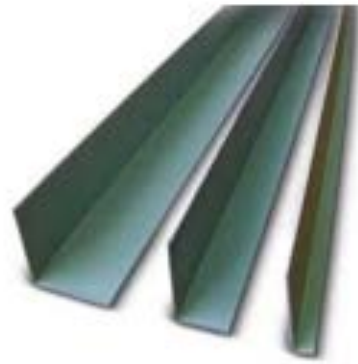
The Fatrafol retention tank system is completely hot air fusion welded which doesn't rely on tapes or sealants to prevent water ingress. The membrane can be mechanically fixed or bonded using the relevant Fatrabond contact adhesive and can be installed over almost any substrate with minimal preparation and does not require any priming to enable the system to operate efficiently.



FATRAFOL 803vs | Yellow/Black PVC Waterproofing Sheet Membrane

The Fatrafol 803vs is a yellow face/black scrim PVC sheet membrane which is resistant to aggressive water pressure and gasses which occur naturally below ground. The Fatrafol 803vs is fully hot air fusion welded along all joints, laps and terminations meaning it is not reliant on adhesives, sealants or tapes to provide its waterproofing integrity.

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 | 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 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.



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.



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.



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.

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:-

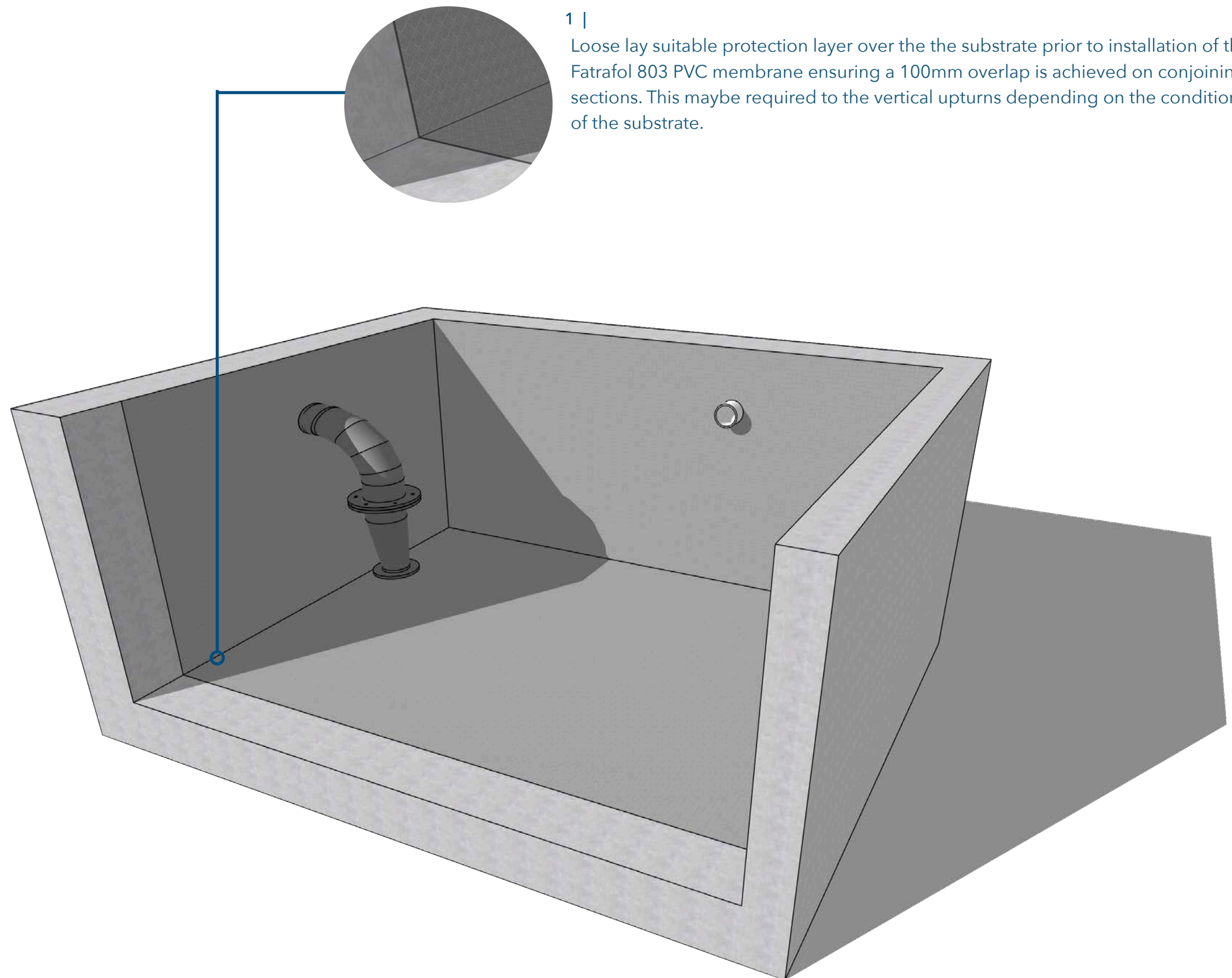
- A. Removal of existing membrane if existing membrane is deemed unsuitable to install directly over.
- B. Removal of defected sections of existing membrane such as vulcanised laps, bubbling and or delaminating membranes, corner fillets, cast in reglets and outlets.
- C. Removal of cappings, flashing, 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.

FATRATEX | PROTECTION LAYER



1 |

Loose lay suitable protection layer over the the substrate prior to installation of the Fatrafol 803 PVC membrane ensuring a 100mm overlap is achieved on conjoining sections. This maybe required to the vertical upturns depending on the condition of the substrate.

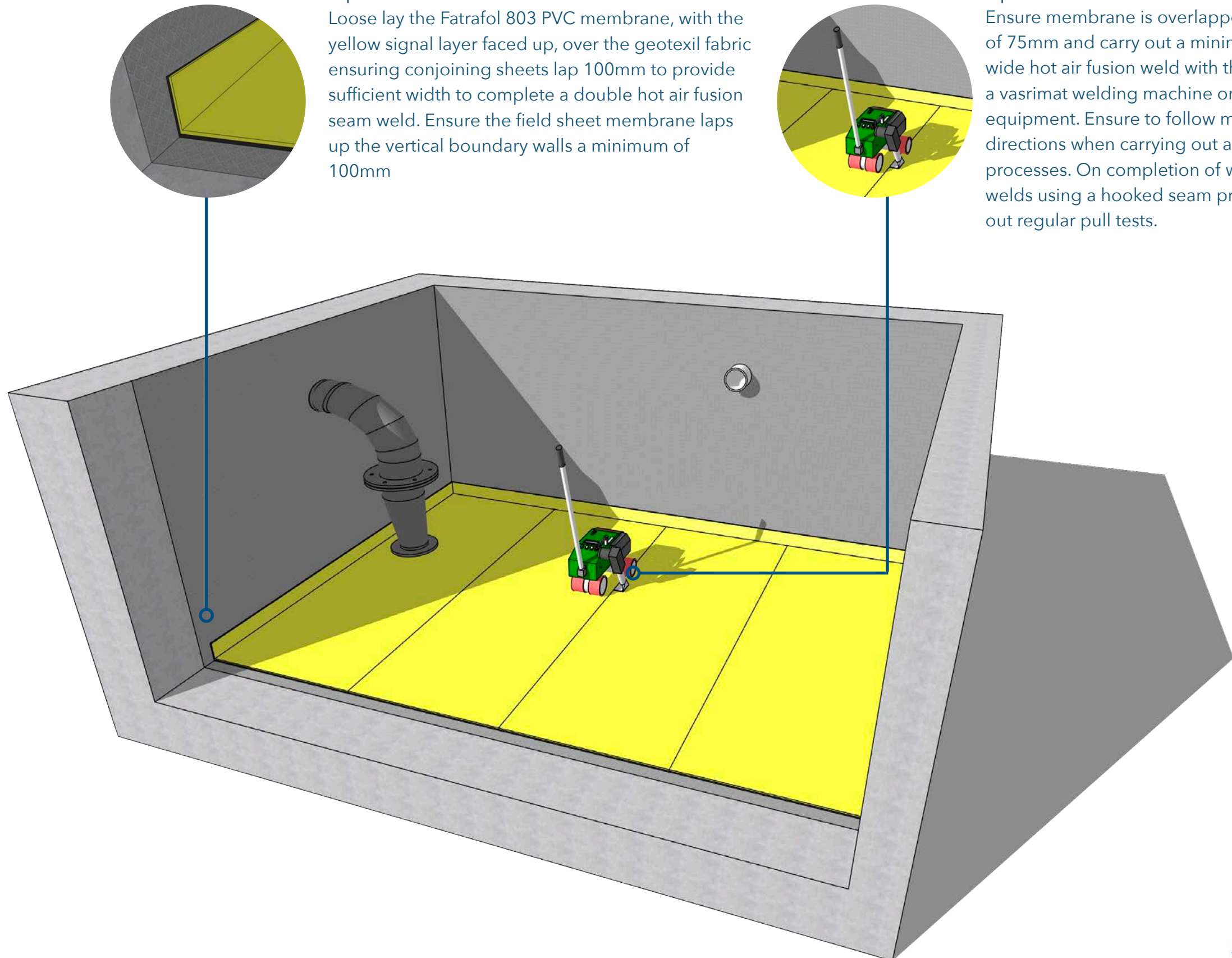
FATRAFOL 803vs | PVC MEMBRANE

1 |

Loose lay the Fatrafol 803 PVC membrane, with the yellow signal layer faced up, over the geotextil fabric ensuring conjoining sheets lap 100mm to provide sufficient width to complete a double hot air fusion seam weld. Ensure the field sheet membrane laps up the vertical boundary walls a minimum of 100mm

2 |

Ensure membrane is overlapped a minimum of 75mm and carry out a minimum 40mm wide hot air fusion weld with the use of either a vasrimat welding machine or hand welding equipment. Ensure to follow manufacturers directions when carrying out any welding processes. On completion of welding test all welds using a hooked seam probe and carry out regular pull tests.

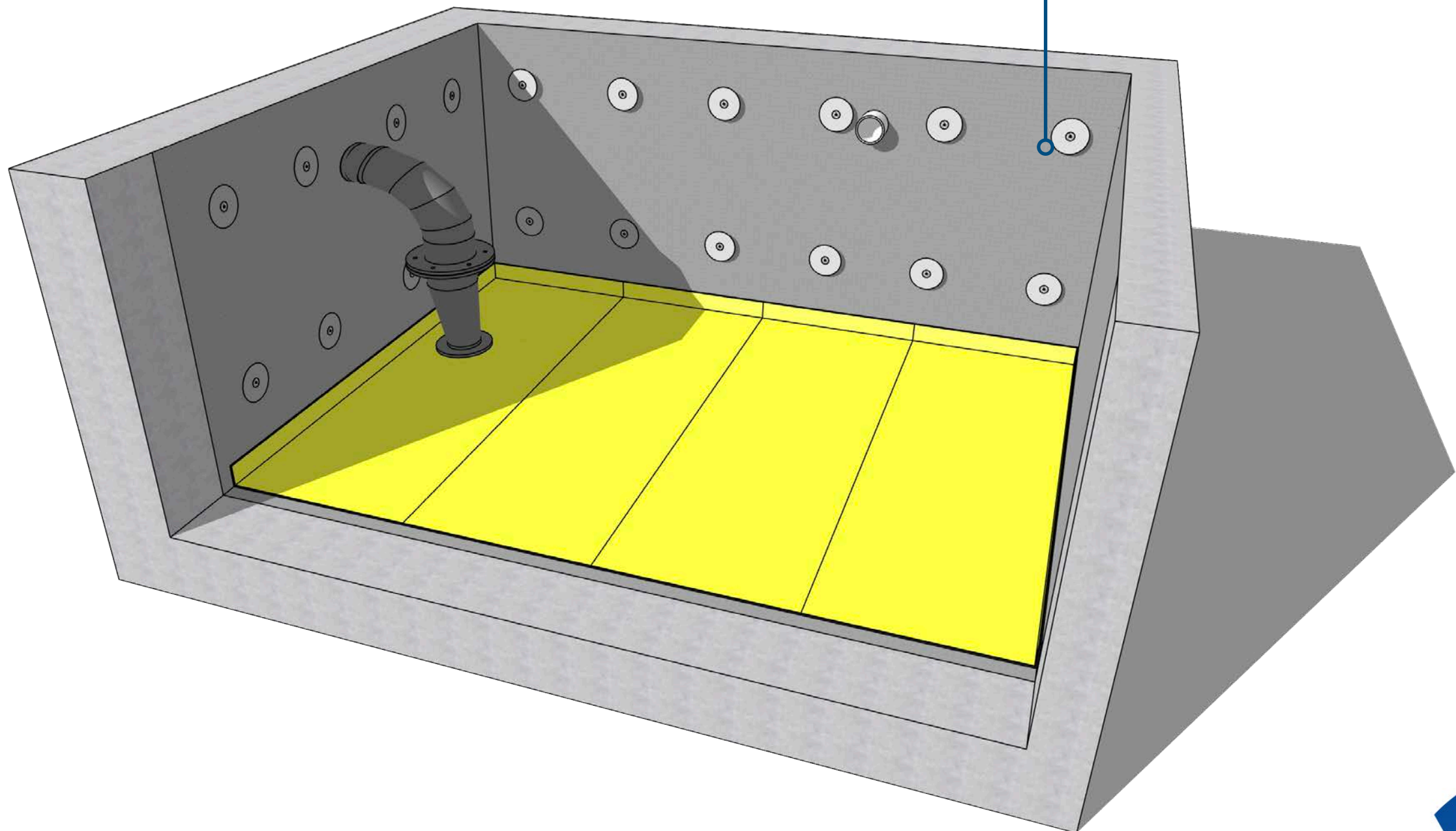


VERTICAL WALL | MEMBRANE FIXING

1 |

Fix Fatra pressure plates using specified fixings along with Fatra PVC disks at approximately 500mm to the vertical wall. The PVC disk fixing system will be used to solvent weld the membrane to the fixing system to hold into place prior to welding. Fixings centres may vary depending on site specific parameters.

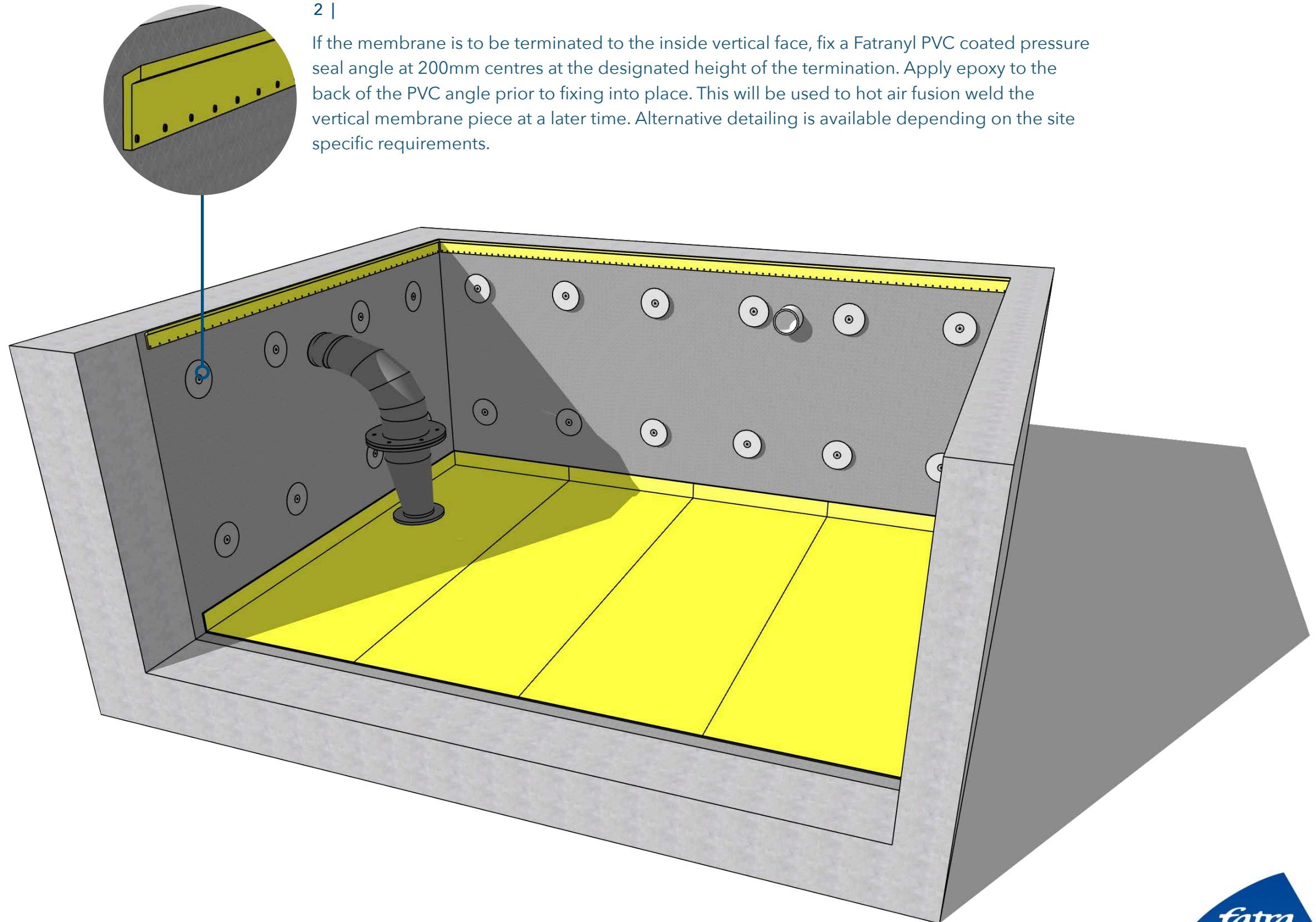
Fatrafol 803 is a non UV stable membrane and is not to be exposed to direct sunlight. Installation methods, detailing and methods will depend on site specific detailing and objectives. Consult with a Fatra Technical Representative prior to proposing specific detailing. All detailing and methods of installation are to be used as guidance only.



VERTICAL WALL | MEMBRANE FIXING

2 |

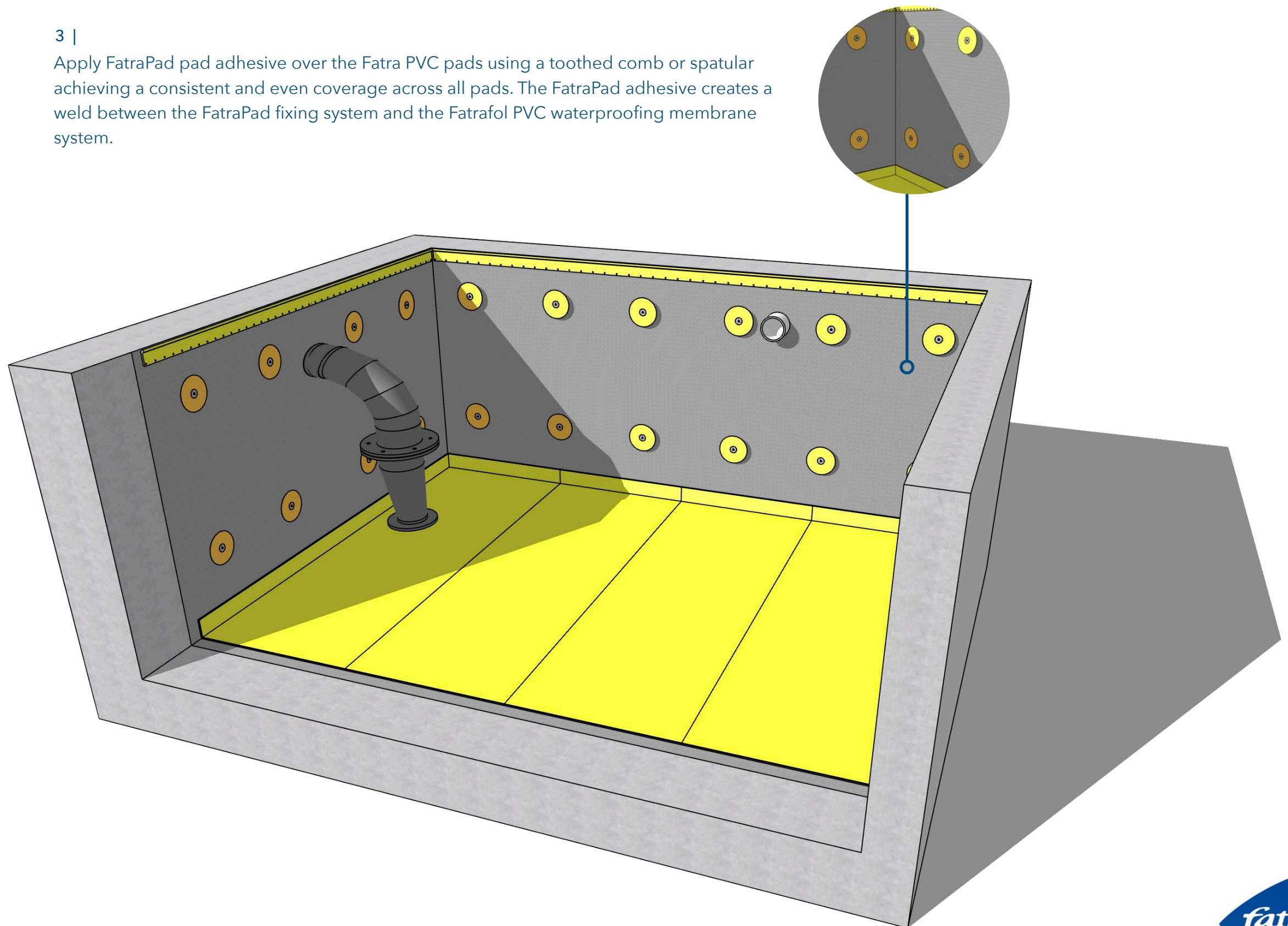
If the membrane is to be terminated to the inside vertical face, fix a Fatranyl PVC coated pressure seal angle at 200mm centres at the designated height of the termination. Apply epoxy to the back of the PVC angle prior to fixing into place. This will be used to hot air fusion weld the vertical membrane piece at a later time. Alternative detailing is available depending on the site specific requirements.



VERTICAL WALL | FATRA PAD ADHESIVE

3 |

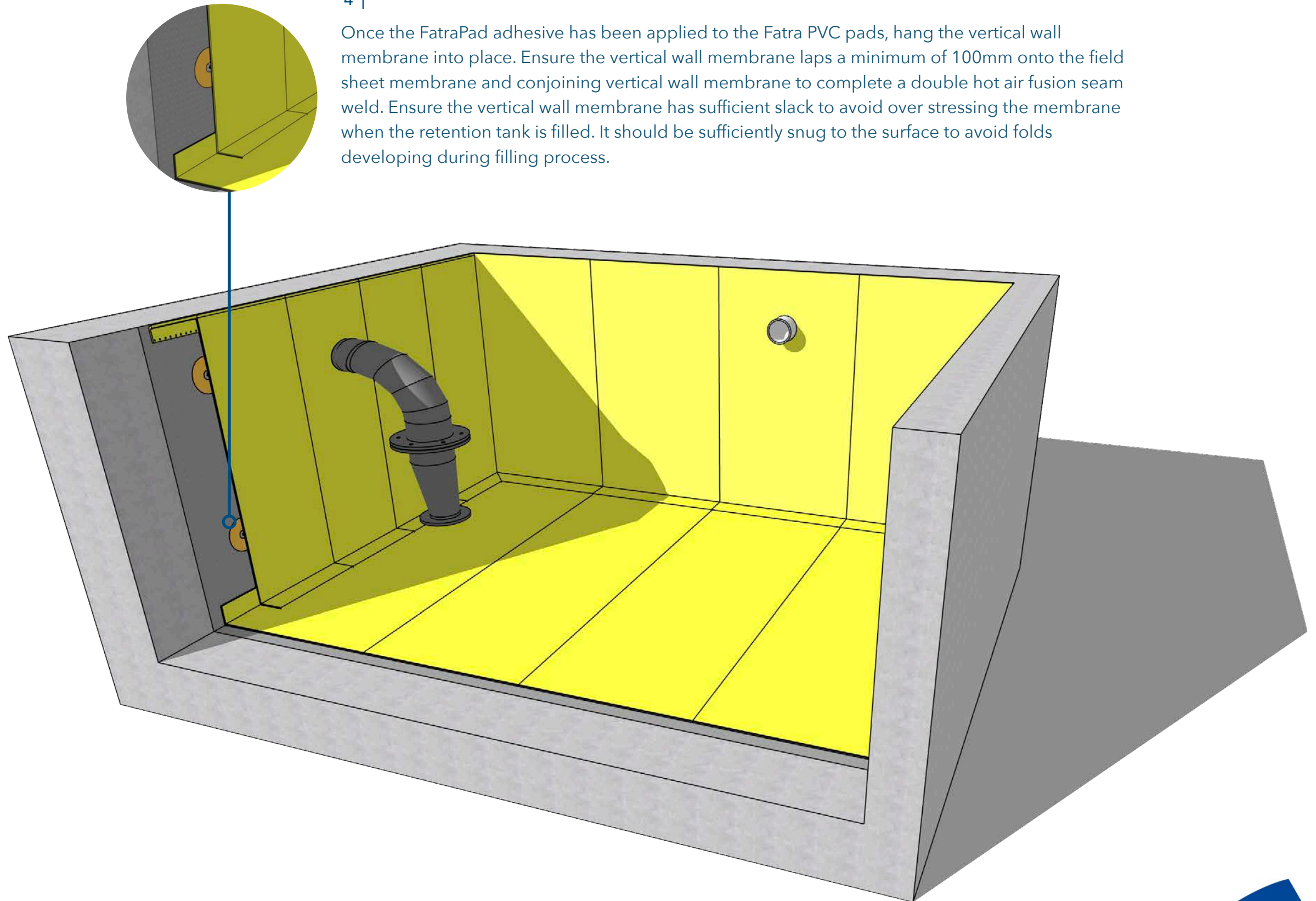
Apply FatraPad pad adhesive over the Fatra PVC pads using a toothed comb or spatular achieving a consistent and even coverage across all pads. The FatraPad adhesive creates a weld between the FatraPad fixing system and the Fatrafol PVC waterproofing membrane system.



VERTICAL WALL | FATRAFOL 803vs PVC MEMBRANE

4 |

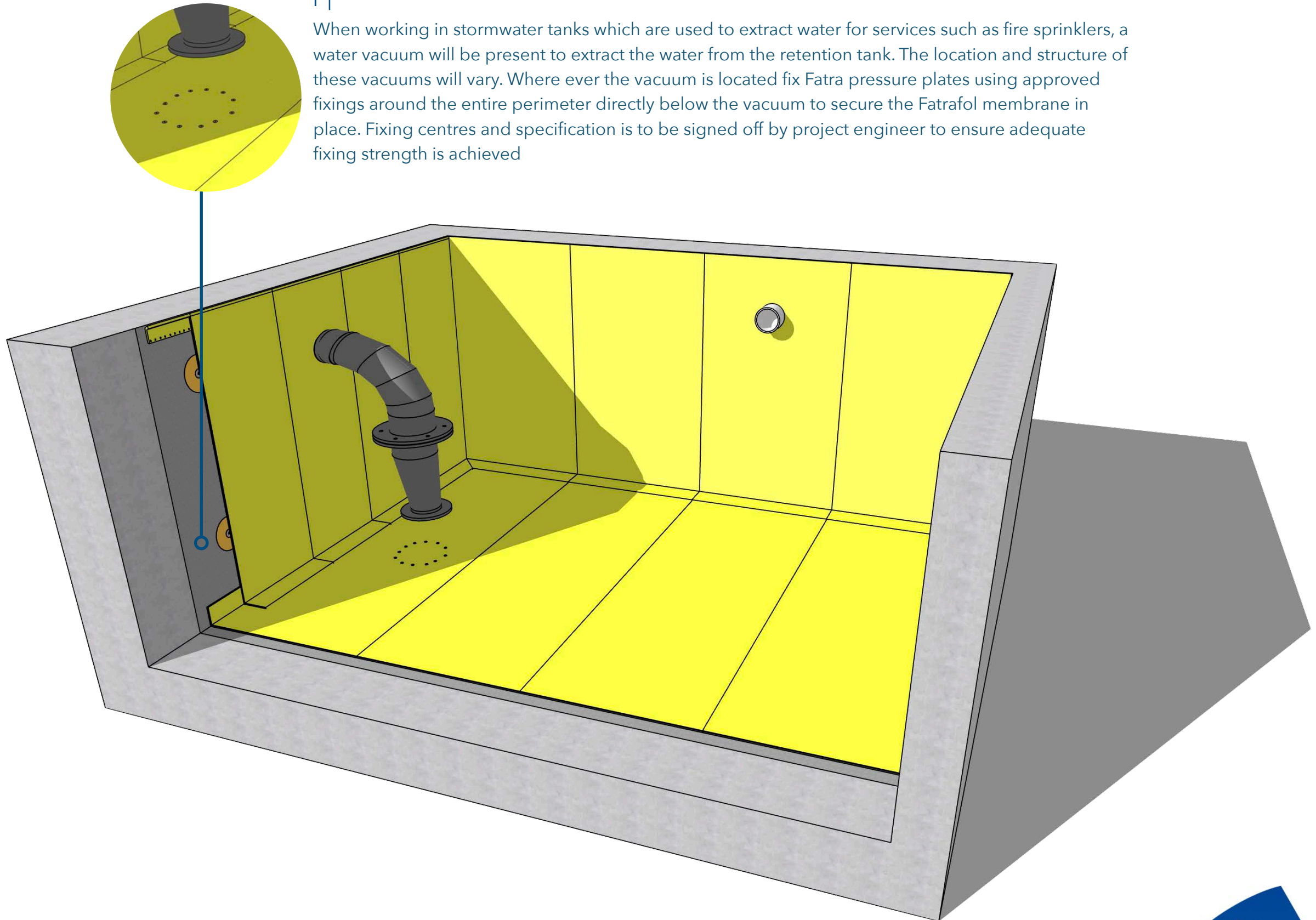
Once the FatraPad adhesive has been applied to the Fatra PVC pads, hang the vertical wall membrane into place. Ensure the vertical wall membrane laps a minimum of 100mm onto the field sheet membrane and conjoining vertical wall membrane to complete a double hot air fusion seam weld. Ensure the vertical wall membrane has sufficient slack to avoid over stressing the membrane when the retention tank is filled. It should be sufficiently snug to the surface to avoid folds developing during filling process.



WATER VACUUM FIXING

1 |

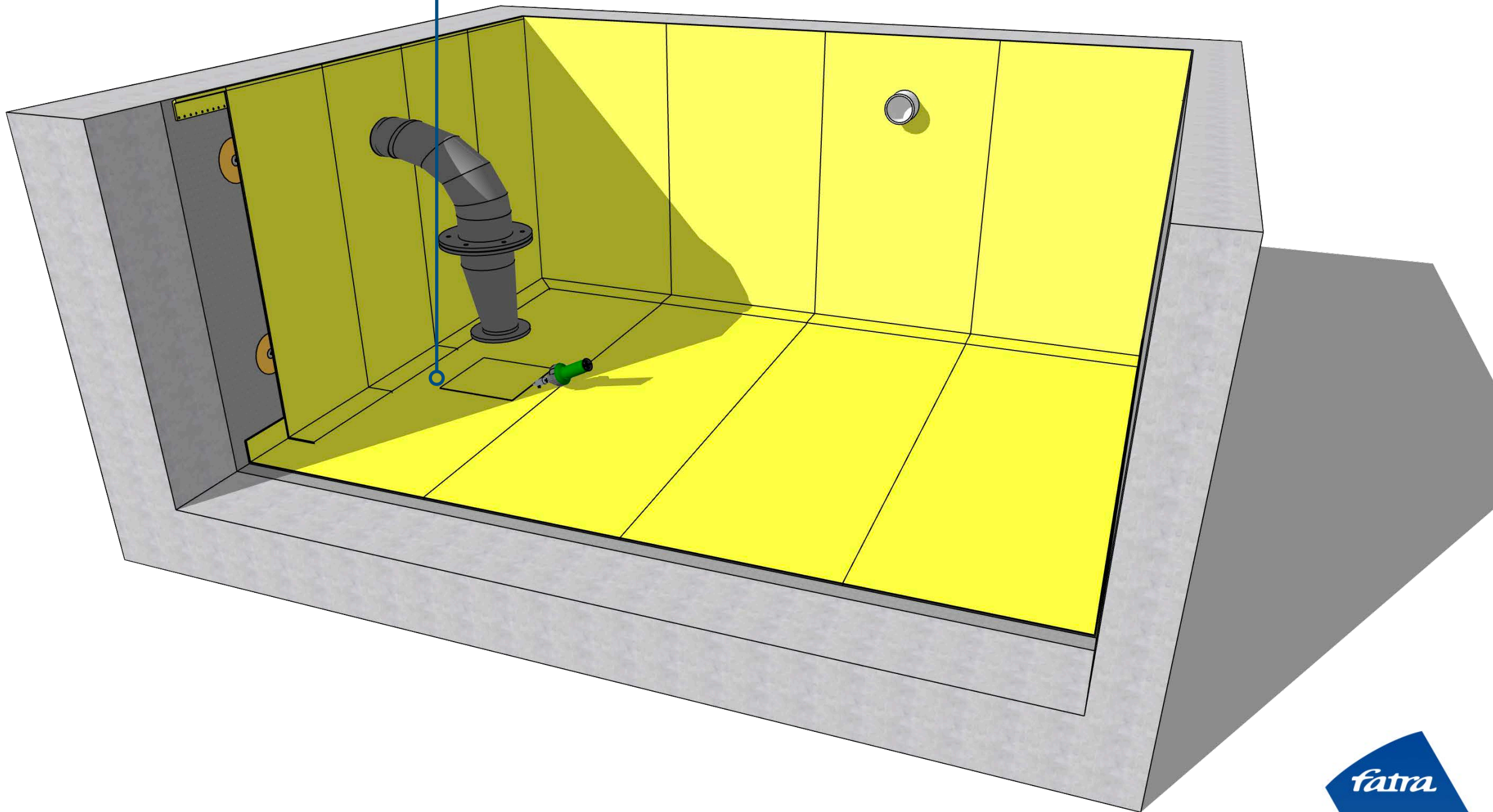
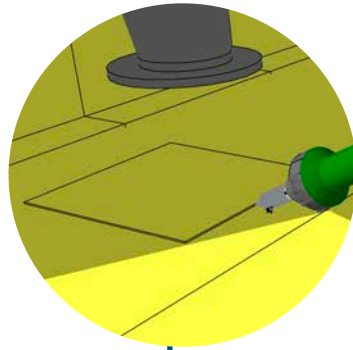
When working in stormwater tanks which are used to extract water for services such as fire sprinklers, a water vacuum will be present to extract the water from the retention tank. The location and structure of these vacuums will vary. Where ever the vacuum is located fix Fatra pressure plates using approved fixings around the entire perimeter directly below the vacuum to secure the Fatrafol membrane in place. Fixing centres and specification is to be signed off by project engineer to ensure adequate fixing strength is achieved



2 |

Once the fixings have been completed over the field

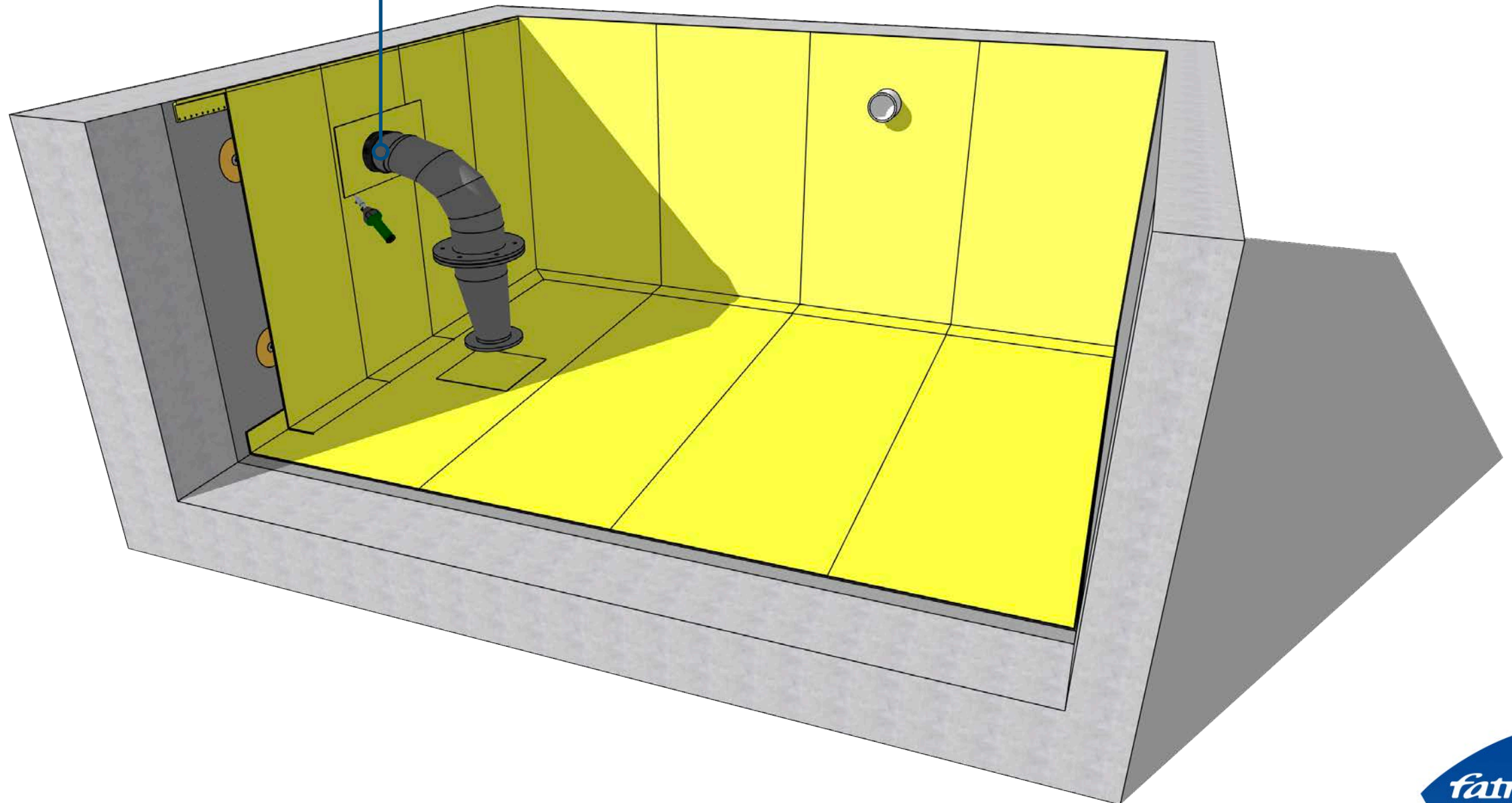
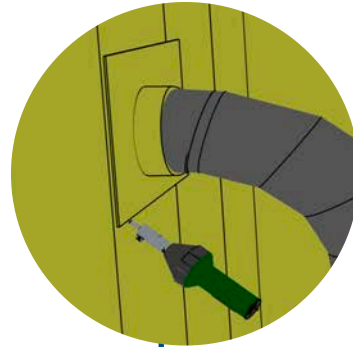
sheet membrane, hot air fusion weld a PVC membrane cover strap over the fixing system to completely conceal the fixings. The Fatrafol PVC membrane strap is to be fully hot air fusion welded around the entire perimeter achieving a minimum of a 50mm weld.



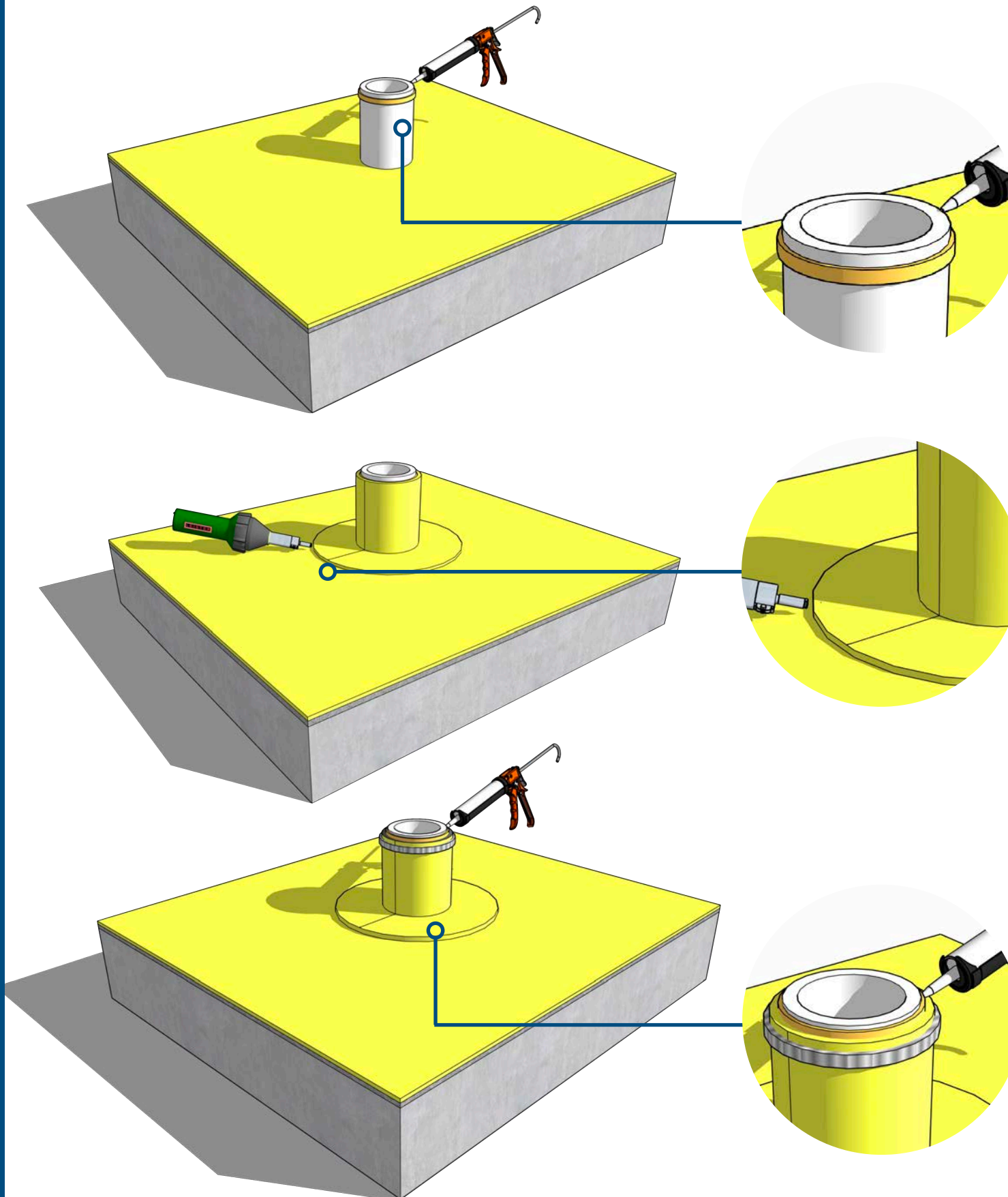
3 |

Where water vacuum pipe is present, detail using Fatrafol

803 PVC membrane. Apply a submersible grade of epoxy to the pipes prior to detailing with the Fatrafol membrane. Hot air fusion weld the PVC membrane base flange to the field sheet membrane. Using a 3 clamp pressure seal detail, apply stainless steel clamping rings to the top of the pipes and apply final bead of epoxy to the top of the PVC membrane collar to fully seal.



PIPE/POST | DETAILING



1 |

Where there are pipes, posts, balustrades and similar penetrations present, Fatra prefabricated pipe collars are to be used to waterproof these details. Once the Fatra PVC field sheet membrane has been installed, install a bead of approved sealant around the penetration approximately 5mm below the highest point where the pipe collar will finish.

2 |

Wrap the Fatra pipe collar around the penetration. The prefabricated Fatra PVC membrane pipe collar is hot air fusion welded down the vertical and horizontal overlapping section of the PVC pipe collar to secure into place.

The Fatra PVC pipe collar base flange is then hot air fusion welded to the Fatrafol PVC field sheet membrane achieving a continuous 40mm weld around the diameter of the flange.

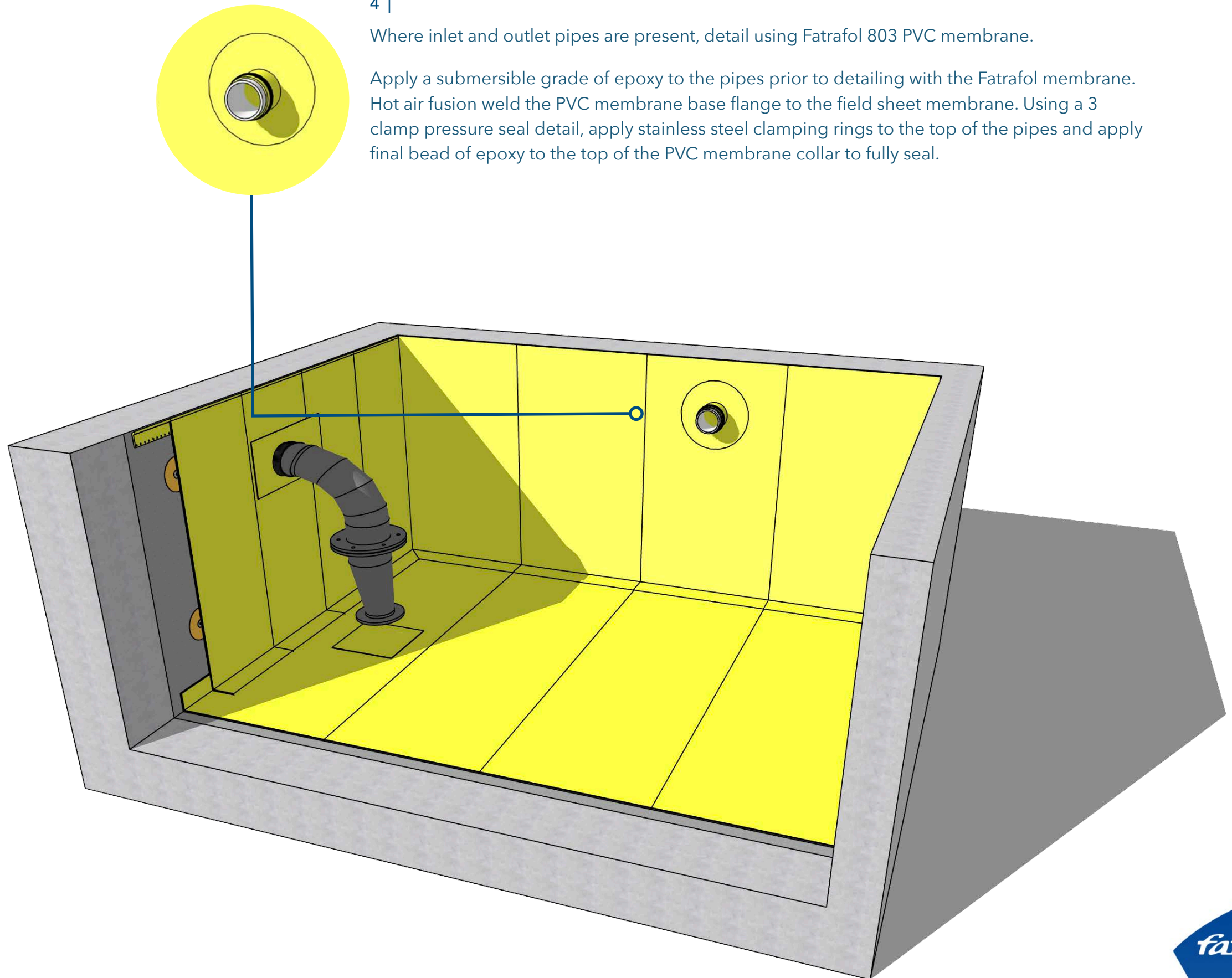
3 |

Install a pressure clamp approximately 5mm from the top of the collar and tighten to create a pressure seal. Once tightened apply a final bead of approved sealant around the top of the pipe collar to seal the detail. If the pipe is hollow, where possible install a rain cap over the pipe to reduce the risk water getting through the pipe and behind the waterproofing system.

4 |

Where inlet and outlet pipes are present, detail using Fatrafol 803 PVC membrane.

Apply a submersible grade of epoxy to the pipes prior to detailing with the Fatrafol membrane. Hot air fusion weld the PVC membrane base flange to the field sheet membrane. Using a 3 clamp pressure seal detail, apply stainless steel clamping rings to the top of the pipes and apply final bead of epoxy to the top of the PVC membrane collar to fully seal.

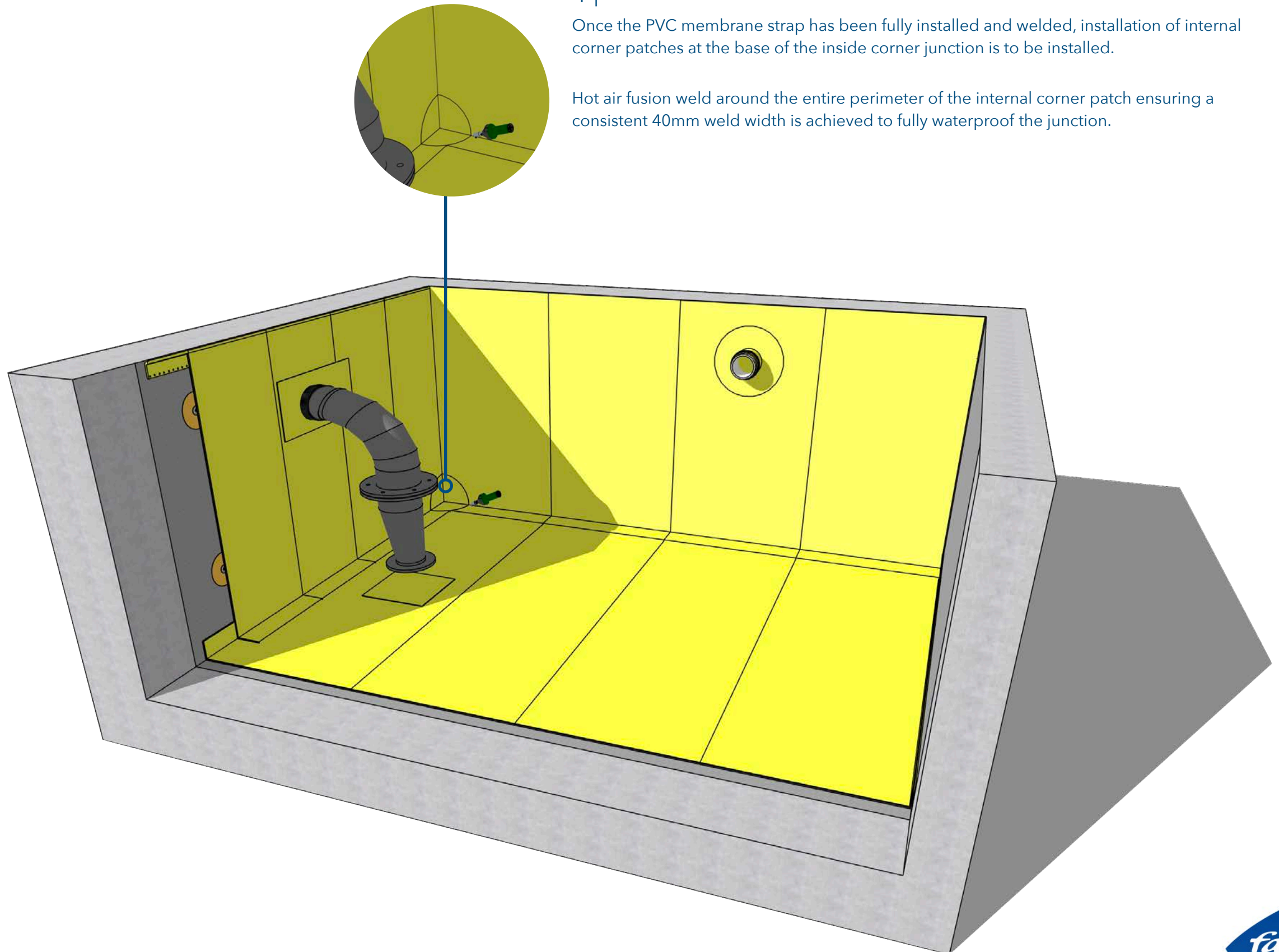


CORNER PATCHES

1 |

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.



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 ¹⁾, 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 m² 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

EMAIL | info@fatraaustralia.com.au

TELEPHONE | 0297 232 048