

General method statement

Proofex Engage Pre-applied Fully-bonded membrane

Section A : General Comments

Application

Fosroc Waterproofing systems must be applied by qualified and certified applicators.

- The applicator must ensure that they have sufficient knowledge and experience in underground construction practices and waterproofing applications.
- The applicator must ensure satisfactory capabilities in terms of equipment, human resources, skillful workmanship, PPE and health and safety.

Coordination

- Waterproofing works are part of the construction sequence, therefore proper scheduling and coordination between all the involved parties must be maintained throughout the work. This includes material delivery schedule, application procedures, sequence of applications and others.
- Drawings and detailing should be prepared prior to the commencement of the work.
- All parties involved in the site must be aware to ensure proper handling of waterproofing materials before, during and after the installation works.
- Any damage before, during and after the installation work must be reported and communicated to the relevant parties, and it must be rectified accordingly.

Material and Equipment

It is suggested that the following list of equipment is adopted as a minimum requirement:

Protective clothing:	Protective overalls Helmet, Good quality gloves, goggles	
Application equipment:	Cutter & Scissors, Broom, Rollers Chalk line and meter scale Waterstops Welding knife and jigs Polyurea WCS Manual/Pneumatic Gun and Static mixers	
Materials:	Proofex Engage membrane Accessories: - Proofex L-section - Proofex Corner Pieces INT/EXT - Proofex Detail Strip	
Others:	Conbextra HF: Conbextra EP150: Supercast PVC Waterstop: Supercast SW: Hydrocell XL: Nitoseal MS600: Nitoseal MS60:	Non-shrink Grout Waterproof Epoxy Grout PVC joints waterstops Hydrophilic swellable joints Waterstop Non-absorbent Joint Filler Joint Sealant Joint Sealant
Material Storage:	Proofex 3000/3000MR: Post-applied self-adhesive membranes Proofex Primer: Primer Proofex Protection Board: Protection Board Proofex Sheetdrain: Drainage and protection membrane	
	All Materials must be stored in shaded areas Materials should be stored as stated in their respective datasheets	

Section B : Application Method

1. Surface Preparation

The blinding concrete surface must be clean and free of sharp edges and protrusions.

The surface should be dry and free of running water. Water leakages should be treated by injection of Nitofill injection system or by Renderoc Plug plugging mortar prior to the application of the membrane.

Measure and calculate the dimensions of the area you are applying the waterproofing. Plan your works such that the required quantities are available and accessible.

2. Membrane Application

2.1 Horizontal Application

Proofex Engage Membrane is supplied in rolls 30m long and 1.27m wide with a selvedge on one side to provide 75mm self-adhered laps between adjacent rolls.

Roll out Proofex Engage with the grid surface upper most. Carefully align adjacent rolls and overlapping the previous sheet by 75mm along the adhesive selvedge. There should be a staggered of half a roll length to avoid build-up of end joints in one area.

Once the sheets are aligned, remove the release tape and firmly roll all joints to ensure the bond seals.

For optimum performance in hot conditions the membrane can be spot welded along the selvedge using welding strip or hot air gun.

Roll-end laps should be butt-jointed using Proofex Detail Strip tape maintaining 100mm lap at both rolls, and then sealed from the top using Polyurea WCS sealer membrane maintaining 25mm at both rolls. End laps should be staggered to avoid build-up of end joints in one area.

2.2 Vertical Application

Proofex Engage membrane is a pre-applied membrane and must therefore be applied prior to concrete pouring.

On the vertical application, there are two conditions:

2.2.1 Non-working space condition (single-sided formwork)

2.2.2 With-working space condition (double-sided formwork)

Depending on the construction and excavation method one or both of the above two methods may be in use.

2.2.1 Non-working space condition (single-sided formwork)

Ensure that the surface of the wall is uniform, clean and dry, and free of cavities and protrusions.

Apply strips of Proofex Detail Strip double-sided adhesive tape, and apply Proofex Engage membrane by adhering it to the pre-applied strips of Proofex Detail Strip.

Whenever required, mechanical fixation on the top may be used to ensure that Proofex Engage is secured in place. The mechanical fixation shall be at a minimum distance of 300mm above the level of the concrete which will be poured at a later stage.

2.2.2 With-working space condition (double-sided formwork)

Apply Proofex Engage membrane at the external side of the formwork before or after it is erected. It shall be applied on the formwork using strips of double-sided adhesive, Proofex Detail Strip.

Once concrete is poured and the formwork is stripped off, Proofex Engage will have already bonded to the concrete structure.

Fill the tie-rod holes with Conbextra GP non-shrink grout, and then apply double patch of Proofex Detail Strip.

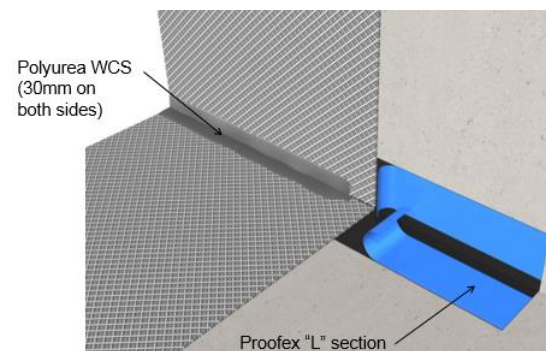
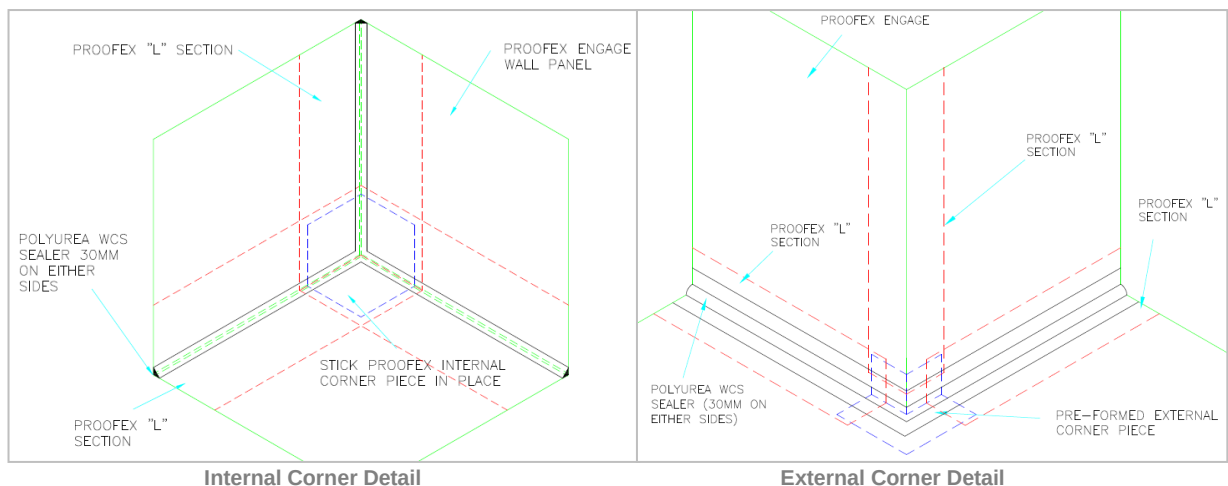
Backfilling can then be made. Proofex Engage doesn't require protection unless the backfill material is aggregate; in which case the membrane shall be protected with Proofex Protection Board.

2.3 Corners and Angles

The connection between the horizontal roll and the vertical rolls should be made by using Proofex L-section. Tack the Proofex L-section in place and then install Proofex Corner Piece Internal/External at the respective corners. Roll to ensure joints are well bonded.

Apply Proofex Engage rolls horizontally ensuring overlapping with the Proofex L-section before removing the release tape. Ensure the back surface of the membrane is clean and free of dust and dirt. Remove the release tape of the Proofex L-section, and fix the non-grid side of the Proofex Engage to surface of the L-section ensuring that the membrane fits into the corners and rolling firmly to ensure adhesion.

Vertically, apply Proofex Engage so that it is overlapped with the Proofex L-section. All corners and angles should then be sealed with 60mm bead of Polyurea WCS fast-setting sealer.



2.4 Pipe Penetration

Place Proofex Tophat over the pipe, apply Proofex Total Tape at the edges of the tophat and remove the release film. Depending on the dimensions of the pipe, use the appropriate Proofex Tophat diameter.

Cut a hole in the Proofex Engage membrane to fit around in the pipe entry, and then place in position and stick it to the Proofex Tophat using Proofex Total Tape or Proofex Detail Strip, rolling down the edges.

Place a cable-tie over the pipe and Proofex Tophat and seal with Nitoseal MS60 sealant to seal around the pipe, and secure in position by tightening the cable tie.

Apply Supercast SW30 swellable waterstop around the pipe ensuring that the concrete cover from both sides it at least 100mm.

2.5 Pile Heat Treatment

Pile tops and edges shall be re-profiled as appropriate using cementitious non-shrink grout Conbextra HF or Conbextra GP.

Cut the Fosroc Proofex Engage tight around the pile top. Create formwork that is at least 100mm larger in diameter than the pile diameter.

Mix and pour the Conbextra EP150 Epoxy waterproof grout to fully encapsulate the pile top and edges. The grout thickness from the top shall be at 30 mm thickness, and on the edges it shall be 50mm to seamlessly join to the Fosroc Proofex Engage waterproofing membrane.

Adhere a strip of Fosroc Proofex Total Tape or Proofex Detail Strip to the edges Conbextra EP150 sides and apply a 2mm x 60mm seam of Fosroc Polyurea WCS all around the circumference of the pile cap.

2.6 Joints

Construction Joints:

Construction joints shall have internally-fixed Supercast Watafoil 250 PVC waterstop or swellable hydrophilic waterstop Supercast SW30, depending on site requirements. Joints shall also have Supercast Predimax Injection Hose.

Expansion Joints:

Expansion joints shall have Supercast Rearguard S250 waterstop placed externally on the top of the pre-applied Proofex Engage using strips of Proofex Detail Strip double-sided adhesive.

In addition, an internally-placed Supercast Hydrofoil 250 waterstop shall be placed in the middle of the joint. Supercast Predimax Injection Hose shall be installed at both sides of the joint. The joint shall be filled with Hydrocell XL non-absorbent cross-linked joint filler.

Continuity between all waterstops must be ensured along all the joints.

3. Inspection and Protection

Proofex Engage applications should be inspected on completion of a specific area before placing any reinforcing steel. Any puncture/scratch damage to the membrane system should be repaired with Polyurea WCS sealer. For huge damages, remove the damaged part and install a new Proofex Engage sheet ensuring butt-joint laps with the existing membrane using Proofex Detail Strip tape, and then over-seal the butt-joint using Polyurea WCS sealer.

During placing of reinforcing steel any damage should be identified and repaired while access to the membrane is relatively easy. On completion of reinforcing placement another inspection should occur and any damage made good.

All overlaps must be watertight and ensure that the waterproofing integrity of the whole area is continuous.

4. Precautions

Before placing reinforcement, ensure that the membrane application is continuous, has bonded laps, end laps taped, penetrations and pile heads are sealed. In addition, ensure that all corners, angles and other intricate details have been sealed by Polyurea WCS.

Placing of the reinforcement should be done with care to prevent damage to the membrane using spreader type spacer blocks or similar, to avoid point loadings and puncturing. Progressive removal of temporary membrane protection used for access and storage should occur as steel fixing proceeds.

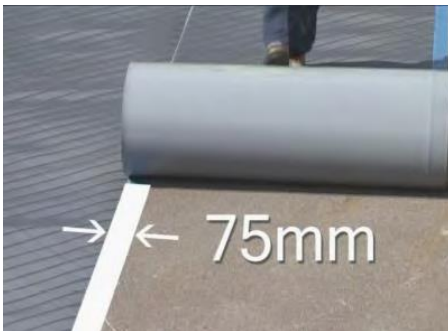
Concrete must be placed and compacted carefully to avoid damage to the membrane. Never use a sharp object to consolidate the concrete. Good concrete quality and good concrete pouring practices must be maintained.

Dewatering shall remain in operation until the whole waterproofing works have been completed successfully.

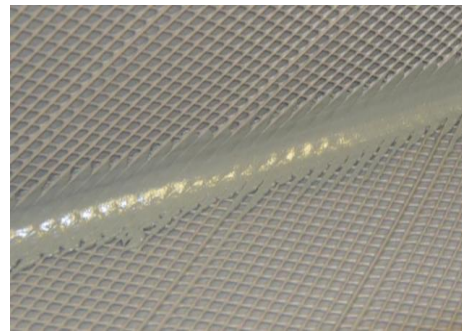
Section C : Approval and variations

This method statement is offered by Fosroc as a 'standard proposal' for the application of Proofex Engage. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to Fosroc in writing for approval prior to commencement of any work. Fosroc will not accept responsibility or liability for variations to the above method statement under any other condition.

Section D : Pictorial Installation Guide



Overlapping adjacent rolls



Sealing with Polyurea WCS



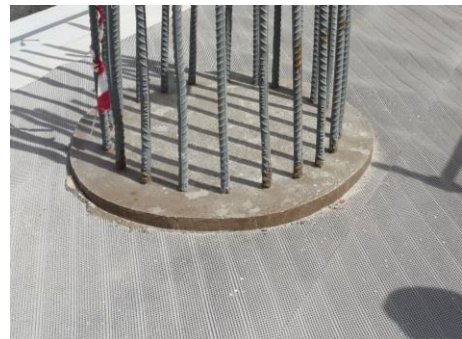
Proofex "L" section



Proofex Tophat for pipes



Proofex Corner Piece INT



Conbextra EP for Pile heads



All laps to be rolled



Supercast PVC Expansion Joints