

Waterproofing below-ground with Proofex Engage

www.fosroc.com



constructive solutions

Our profile

Since the company's beginnings over 50 years ago, Fosroc has developed into an International leader in delivering Constructive Solutions for projects across a broad range of market segments including transport, utilities, industrial and general buildings.

Fosroc has an extensive network of offices and manufacturing locations across Europe, the Middle East, India, North and South Asia, and is further represented in other regions across the world by distributor and licensee partners. For details of your local offices, please refer to www.fosroc.com.

Selecting from the full portfolio of Fosroc products & services and integrating expert technical support, world-class customer service and innovation, Fosroc goes beyond just product selling to ensure that we partner with our customers to deliver complete constructive solutions.

- Cement Grinding Aids
- Concrete Admixtures
- Surface Treatments
- Grouts & Anchors
- Waterproofing
- Joint Sealants
- Concrete Repairs
- Surface Coatings
- Industrial Flooring

International leader in delivering Constructive Solutions



FOSROC quality is appreciated worldwide in the most demanding of construction applications; the result of decades of experience delivering solutions to many iconic structures.

The Burj Al Arab, one of the world's most recognised structures, is a good example of where Fosroc worked hand-in-hand with the contractors and project consultants to identify the best product systems that would provide optimal performance in the difficult construction circumstances.

Careful consideration needed to be given in the selection of concrete admixtures and other product systems to provide comprehensive solutions in key areas such as waterproofing and pile heads.

The result was >4.5 million litres of **Fosroc Conplast** admixtures and various **Fosroc Proofex** waterproofing membranes being successfully applied surpassing the stringent specifications required for the project.

how we can help you

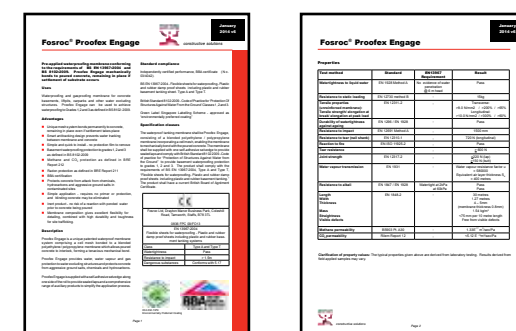
For a tailored project solution please contact your local Fosroc office where experienced staff will assist and provide you with a high level of support, including:

- Seminars
- Project specifications
- CAD details
- Site support



FOSROC's vast experience in providing waterproofing solutions to many famous structures around the world has been built on a broad range of products. These include pre-applied, loose-laid, liquid-applied, cementitious, drainage, self-adhesive, torch-on and spray-applied membranes; along with PVC, swellable, composite PVC/swellable and injection hose waterstops.

Fosroc offers the most comprehensive range of below-ground waterproofing product systems, manufactured to the highest quality standards backed by independent test certificates. Our wealth of experienced technical experts and specification managers will help you find the best system solution for your project.



successful over
a long number
of years

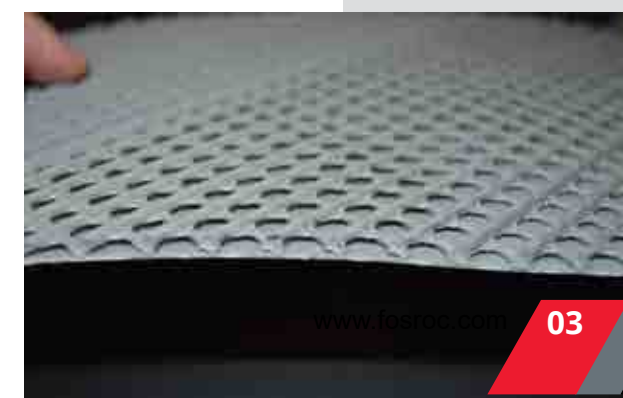


Proofex Engage waterproofing

The **Proofex Engage** system is a proven technology and has successfully waterproofed millions of sqm of below-ground structures since its launch. It can be found in projects in many countries around the world and is quite simply one of the best performing cost-effective below-ground waterproofing solutions available today.

Brochure contents

- Innovative technology
- BS8102:2009
- The benefits of using Proofex Engage
- Typical applications
- A system-based solution





Proofex Engage

Innovative anti-tracking, pre-applied waterproofing system

The solution that stands the test of time



Walls



Floors



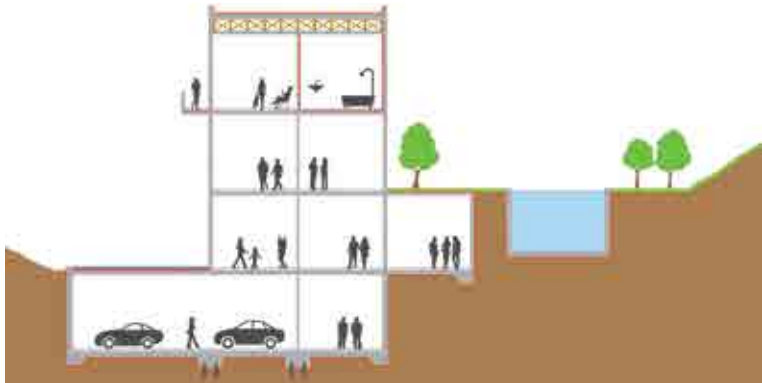
Precast concrete

Below-ground waterproofing

For below-ground structures where the exterior face of the structural concrete is inaccessible, the waterproofing must be applied prior to pouring the concrete. Conventional systems are either loose-laid or self-adhering to the substrate not the structural concrete, this means there is no seal between the waterproofing and the structural concrete which can lead to water travelling between the waterproofing and the structure from any leakages that may occur. BS8102:2009 highlights this problem and recommends that a fully-bonded pre-applied waterproofing system be used to mitigate this risk. A similar problem occurs where ground settlement takes place.

Fosroc have developed an innovative system, **Proofex Engage**, which incorporates a unique cell mesh which mechanically bonds to freshly placed concrete giving a tenacious waterproof seal, preventing water migration even if ground settlement occurs. It is installed rapidly with no need for blinding concrete, priming or protection and can be trafficked immediately after application. It is also gas resistant and highly durable and is unaffected by contaminants within the ground. Quality is assured through BBA and EN13967:2004 and the system is suitable for use in accordance with BS8102:2009 Grades 1, 2 and 3.

- Rapid installation – no blinding concrete or protection required.
- Assured watertight integrity even in the event of ground settlement.
- No water-tracking.
- Easy jointing and compatible full range of ancillaries.
- Integrity assured at pile caps.
- Excellent solution for precast concrete.
- Protects structure against ground contaminants.
- Long-term watertight durability.



Proofex Engage – saves time and money



Proofex Engage pre-applied premium waterproofing system

- Structural concrete
- Steel reinforcement
- Proofex Engage membrane



Self-adhesive / Torch-on waterproofing system

- Structural concrete
- Steel reinforcement
- Screed or board protection
- Self-adhesive / Torch-on membrane
- Blinding concrete



PVC waterproofing system

- Structural concrete
- Steel reinforcement
- Screed or board protection
- Geotextile
- PVC membrane
- Geotextile
- Blinding concrete

BS8102:2009

The recently revised BS8102:2009 standard for waterproofing below-ground structures, gives recommendations and provides guidance on methods of dealing with and preventing the entry of water from surrounding ground into a structure below ground level. Designers are encouraged to follow a process chart, to ensure that the correct waterproofing system will be selected. Some of the recommendations are highlighted below:

- To help mitigate risk, specify a combination of various types of compatible protection sourced from the same manufacturer.
- Where a waterproofing barrier is required for a structure supported on piled foundations, special consideration should be given to the detailing so that structural continuity is not compromised.
- Strategies for dealing with groundwater, soil gases and contaminants should be considered from the earliest stages of the planning and design processes.
- Products that are both water and gasproof are more cost-effective.
- Where waterproofing admixtures are used, these should be in conjunction with other waterproofing components supplied by the same manufacturer, e.g. waterstops, membranes and sealants.
- Fully bonded systems allow potential defects to be located and made good more easily.
- Each project structure should be designed to its particular grade.

Grade	Example of use of structure	Performance level
1	Car parking; Plant rooms (excluding electrical equipment); Workshops.	Some seepage and damp areas tolerable, dependent on the intended use. Local drainage might be necessary to deal with seepage.
2	Plant rooms and Workshops requiring a drier environment (than grade 1); Storage areas.	No water penetration acceptable. Damp areas tolerable; ventilation might be required.
3	Ventilated residential and commercial areas, including offices, restaurants etc; Leisure centres.	No water penetration acceptable. Ventilation, dehumidification or air conditioning necessary, appropriate to the intended use.

One, or a combination of the following types of waterproofing protection should be selected:

Type A – (barrier) protection

Protection against water ingress which is dependent on a separate barrier system applied to the structure.

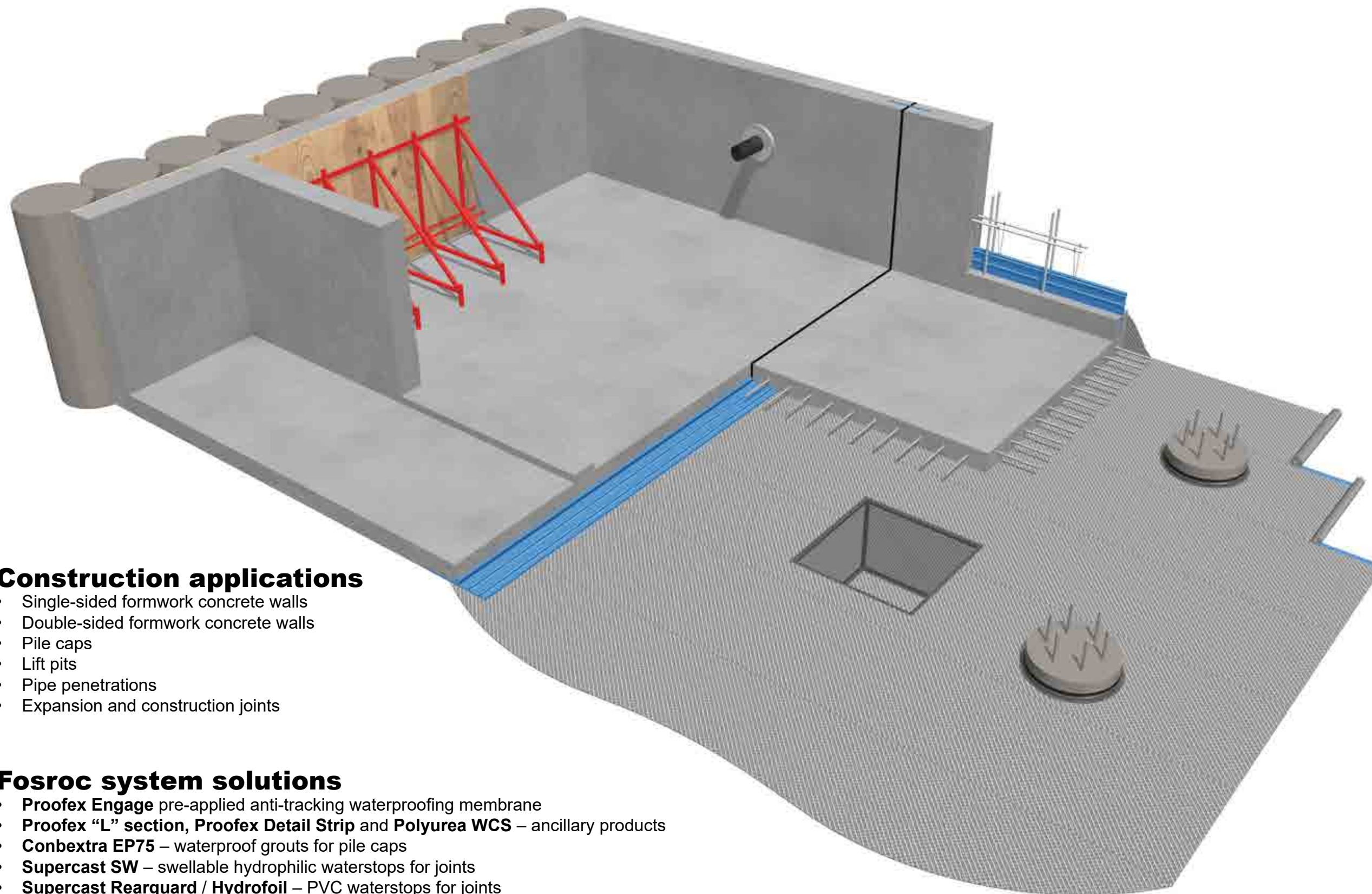
Type B – (structural integral) protection

Protection against water ingress which is provided by the structure.

Type C – (drained) protection

Protection against water ingress into usable spaces which is provided by the incorporation of an appropriate internal water management system.

Proofex Engage is an excellent choice for fully bonded Type A barrier protection for below-ground structures for basement Grades 1, 2 and 3. It is fully compatible with the Fosroc Proofex Cavitydrain internal drainage systems and Conplast WP grades of waterproof concrete admixtures assuring best system performance sourced from the one supplier.



Construction applications

- Single-sided formwork concrete walls
- Double-sided formwork concrete walls
- Pile caps
- Lift pits
- Pipe penetrations
- Expansion and construction joints

Fosroc system solutions

- **Proofex Engage** pre-applied anti-tracking waterproofing membrane
- **Proofex “L” section**, **Proofex Detail Strip** and **Polyurea WCS** – ancillary products
- **Conbextra EP75** – waterproof grouts for pile caps
- **Supercast SW** – swellable hydrophilic waterstops for joints
- **Supercast Rearguard / Hydrofoil** – PVC waterstops for joints
- **Supercast Predimax** – injection hose waterstop for joints
- **Hydrocell XL** – rot-proof non-absorbent filler board for joints
- **Conplast** and **Structuro** – concrete admixtures

Non water-tracking

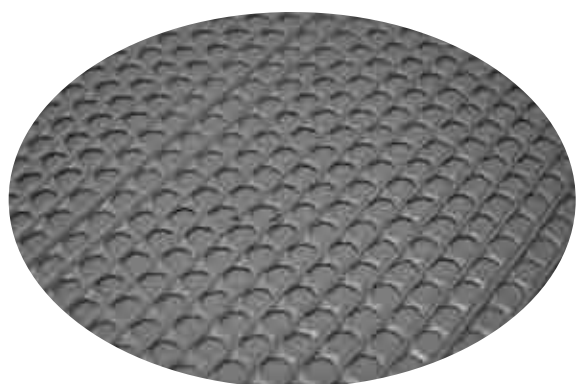


In the unlikely event of damage to the membrane during installation, the smart anti-tracking mesh design of Proofex Engage will prevent water tracking between the membrane and the concrete.

Proofex Engage has been tested to ASTM D5385 and shows no lateral water migration when tested at 100m hydrostatic water pressure.

This high performance means that unlike loose-laid membrane systems, there is no requirement for expensive PVC waterstop and injection compartment systems.

Strong mechanical bond

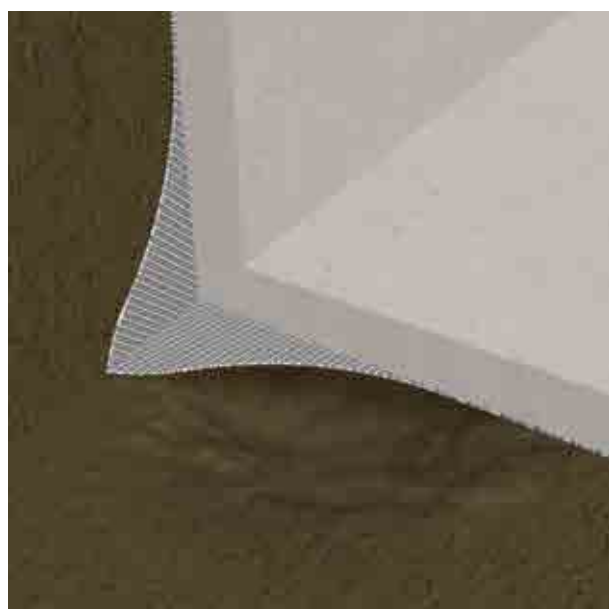


The unique mesh design of Proofex Engage gives a permanent tenacious mechanical bond to freshly placed concrete.

This bond is not dependent on any chemical reaction and can be assured each time concrete is cast.

The heavy-duty mesh design and properties result in a robust, proven membrane which is ideally suitable for project conditions.

Permanently bonds to structural concrete



PVC membranes, self-adhesive and torch-on membranes can collapse where ground settlement takes place.

This can lead to stretching and tearing of the membrane and can result in leakages.

Proofex Engage however, will remain in place fully bonded to the structural concrete assuring complete waterproof integrity even if ground settlement occurs.

**solutions
through
innovation**

No blinding concrete required



Blinding concrete is preferred, however Proofex Engage can be placed directly on top of a well compacted smooth granular fill substrate. A broadcast of damp sand on top of the granular material is useful.

Removal of the blinding concrete means less concrete and less labour time but also means less concrete truck movements which not only saves time and money but is more environment friendly.

No membrane protection required



Proofex Engage is a robust, heavy duty membrane with millions of sqm in projects throughout the world.

The structural steel reinforcement is laid directly on top of the membrane ready for the structural concrete placement.

There is no requirement for screed protection which saves valuable time and money.

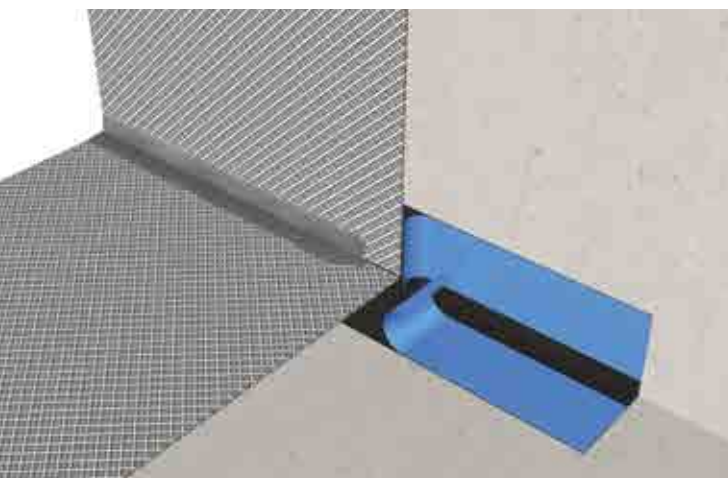
Benefits to owners / designers

An ever increasing level of importance is being placed by owners and designers with regard to structural integrity, cost-effectiveness and durability. Fosroc recognises this, and Proofex Engage with its proven history, excellent holistic cost benefits and independent certification offers an unparalleled system solution for below-ground structures to combat these demands. It provides owners, clients and designers with a high performance system backed by excellent customer/technical service delivered through a comprehensive international network.

Benefits to contractors / installers

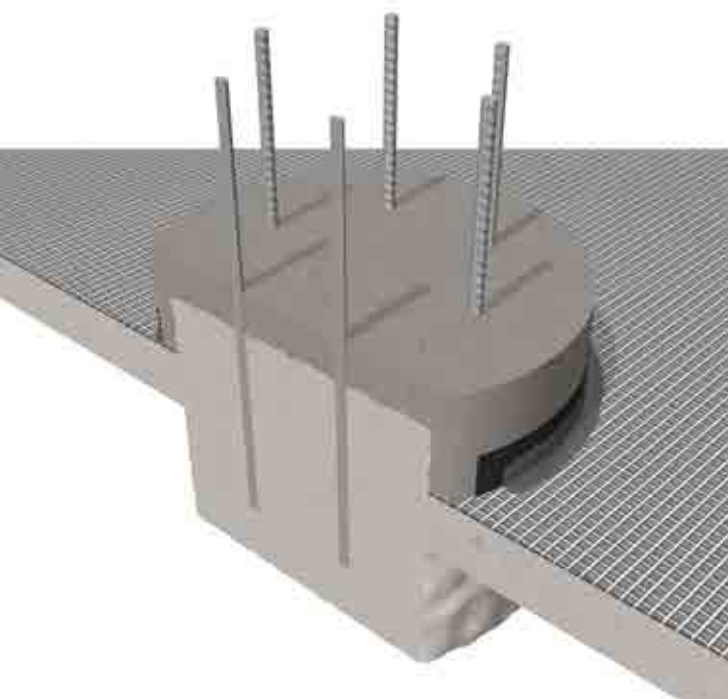
Proofex Engage is designed for typical site conditions. It is heavy duty, robust and can be rapidly installed with easy to apply jointing ancillaries which are system-compatible. The system has a long track record, however Fosroc can offer on-site training assistance for specific projects, delivered through teams of local experts. Contact your local Fosroc office for more details.

Typical details



Floor/Wall transitions are easily achieved using Proofex “L” section rolls. The blue release film is peeled off leaving a sticky butyl adhesive on to which the Proofex Engage is attached.

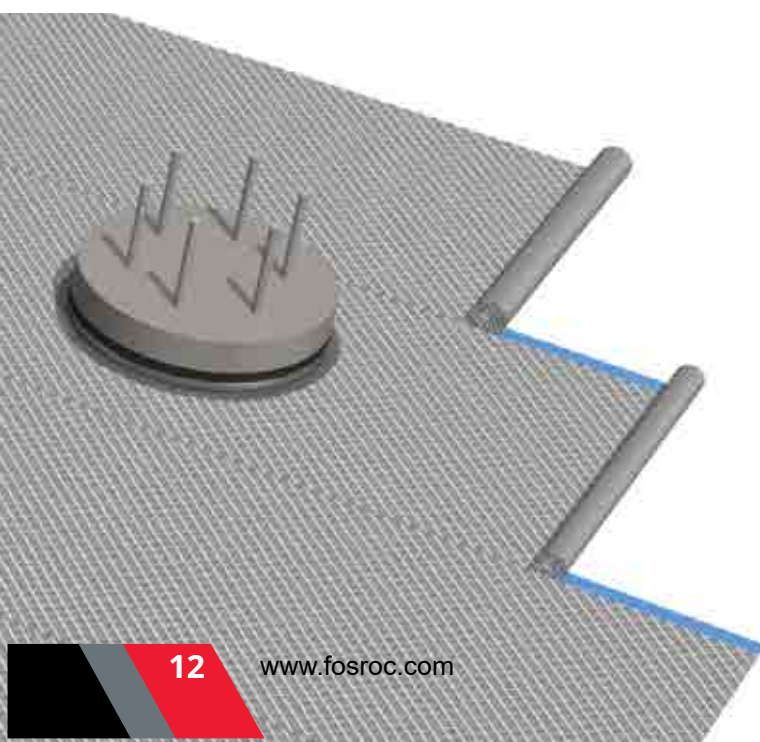
The seal is completed with a seam of Polyurea WCS Gun Grade.



Pile Cap waterproofing integrity is critical in deep basement construction and careful attention must be given to ensure that no leakages occur.

The Fosroc solution has been proven successful over a number of years where Conbextra EP75, waterproof epoxy grouts provide a connection with the Proofex Engage.

The free-flowing grout forms a secure connection with the mesh of the Proofex Engage. The seal is complete with a seam of Polyurea WCS Gun Grade.

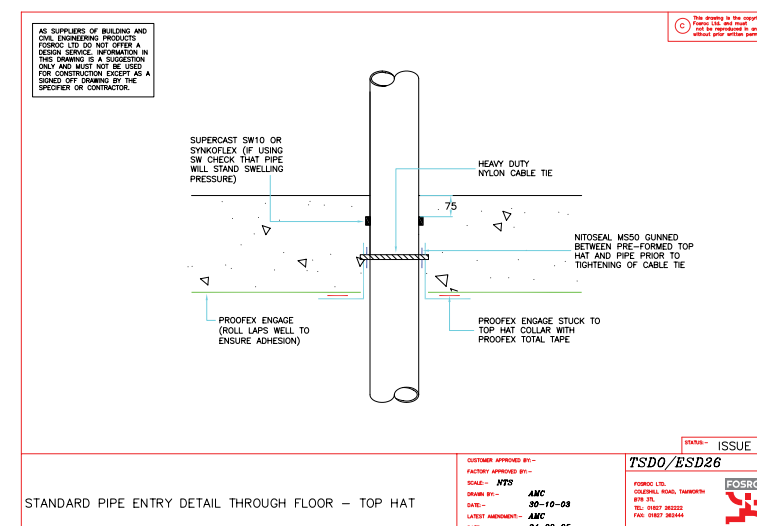


Lapping of Proofex Engage is simple. Along the length of each roll there is a selvage strip consisting of a blue release film and a sticky butyl adhesive.

The blue release film is peeled off and adjacent rolls are laid on top of the butyl adhesive.

At roll ends the Proofex Engage is butted together on a strip of Proofex Detail Strip then sealed with a seam of Polyurea WCS Gun Grade.

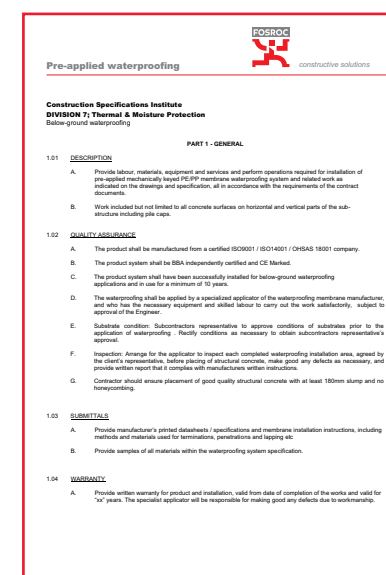
CAD drawings



Standard CAD drawings are available for the Proofex Engage system, covering the typical construction methods encountered in below-ground waterproofing projects.

Should you require bespoke CAD drawings for your project then please contact your local Fosroc office where we can put you in contact with one of our local specification managers.

Specification clauses



Full specification clauses are available for below-ground waterproofing with the Proofex Engage system, including waterstops, pile cap grouting and ancillaries.

Specification formats are; CSI and NBS

Please contact your local Fosroc office for full details.

Case studies and references

Proofex Engage has been successfully waterproofing many structures across the world since its launch in 1999.

Case studies are available along with project references, please contact your local Fosroc office for full details.

A successful, fully waterproof below-ground structure complying to the recognised standards, can only be delivered through holistic design of a complete system. Inappropriate interfaces, poor installation, and inadequate product selection can create weak points that are expensive to correct. The Fosroc systems-based approach is essential in creating and maintaining structural durability and assured internal protection against water, gases and other contaminants for below-ground structures.

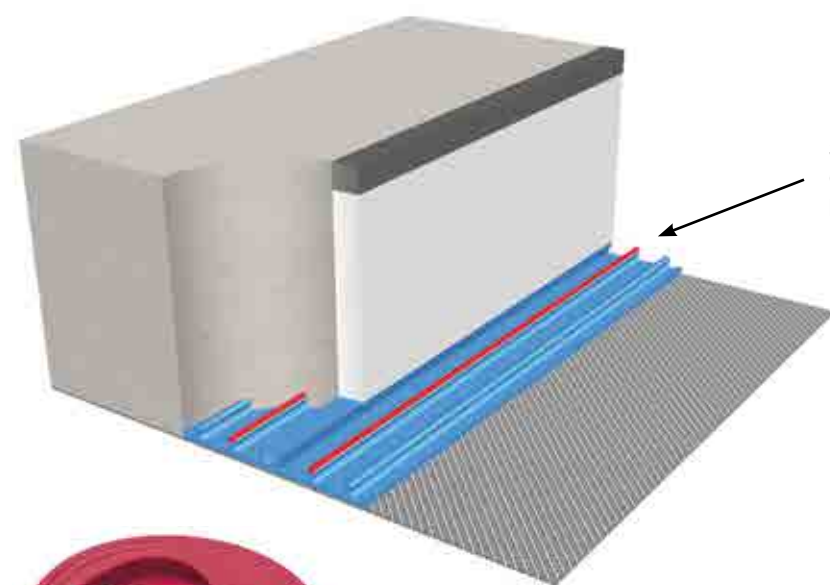
Fosroc's comprehensive range of below-ground waterproofing products are innovative, high quality and have been developed as compatible systems to help reduce the risk of basement leakages. Dedicated specification managers, fluent in the content of BS8102:2009 are available to give you technical support and to guide you through the various system options for your specific project.

Supercast waterstops

Every sizeable concrete retaining wall, basement floor slab, buried roof slab, length of tunnel or reservoir wall must have joints. These may be a mixture of construction or expansion joints but all such joints in direct contact with water or wet ground, even when shielded by a membrane, need protection by waterstops.

Waterstops can be found in the form of PVC profiles or swellable strips, both types are installed to prevent the passage of water through joints in the structure. Future cracks or leakages at joints can be resin injected by means of **Supercast Predimax** injection hose waterstops which are installed during the construction phase, ready for future sealing if required.

The Fosroc **Supercast SW** range of swellable waterstops are "basic polymer" type strips which provide class-leading wet/dry cycling and hydrostatic pressure vs time performance giving assured long term watertight integrity.

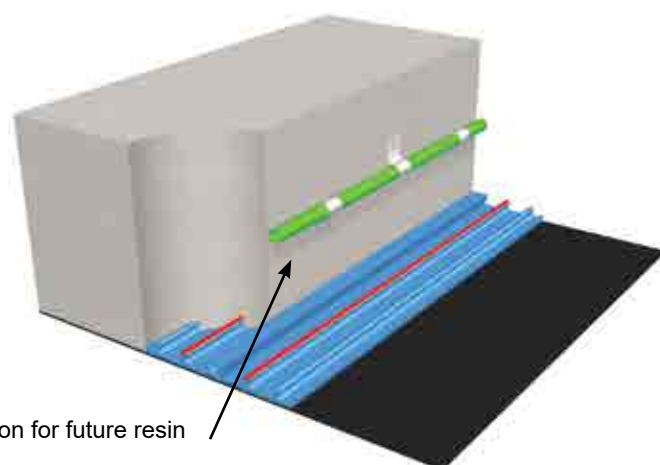


Supercast Rearguard R
Composite PVC / swellable waterstop giving an extra level of protection.

**class-leading
wet/dry cycling**



Supercast SW 10 / 20 / 30
Basic polymer swellable waterstop strips with class-leading wet/dry cycling long term performance.



Supercast Predimax
Injection hose waterstop, provision for future resin injection at joints if required.

Proofex drainage membranes

External drainage

Where sub-surface drainage is deemed necessary to lower the potential for hydrostatic pressure on the waterproofing system and lessen the risk of water ingress through defects, it can be provided by means of an externally placed HDPE geosynthetic drainage membrane. **Proofex Sheet drain 80 and 100** can provide up to 3.5L/s/m water flow capacity and are suitable for soil depths up to 20m.

- Cost effective - no need for up to 500mm thick stone drainage layer behind retaining walls.
- Easy site application.
- Reduced environmental impact - no need for vehicular removal and transportation of spoil off site and subsequent replacing with expensive stone drainage layer.
- Secondary waterproofing.
- Protection to the main waterproofing.
- Single solution for both drainage and protection.



**reduced
environmental impact**

Internal drainage

For BS8102:2009 Type C drained cavity waterproofing, the structural concrete is designed to minimise water penetration and a suitable HDPE studded drainage membrane is installed to collect groundwater seepage. The groundwater is then directed to suitable discharge points.

Proofex Cavitydrain 80 and 200 drainage membranes can provide up to 10L/s/m water flow capacity.



FOSROC OPERATIONS

- Head Office
- Plant
- ★ Regional Offices
- ▲ Branch Offices

Fosroc Chemicals (India) Pvt Limited

Head Office

Embassy Point, No. 150, 2nd Floor, Infantry Road, Bangalore - 560 001, Karnataka

Phone : +91 80 4252 1900

Fax: +91 80 2228 1510

Regional Offices

WEST	:	Thane (West) – 400 615, Maharashtra	Phone : (022) 6229 6800
NORTH	:	Noida – 201 309, Uttar Pradesh	Phone : (0120) 4270620/1/3
EAST	:	Kolkata – 700 068, West Bengal	Phone : (033) 6534 3188
SOUTH	:	Chennai – 600 028, Tamil Nadu	Phone : (044) 2489 9994

Branch Offices

Ahmedabad	-	(079)	4005 2800, 4005 2801	Nagpur	-	+91 9561001353
Bhubaneswar	-		+91 97770 49670 / +91 99370 28267	Jaipur	-	+91 9784007155
Chandigarh	-	(0172)	263 6855	Patna	-	+91 9771495335
Cochin	-	(0484)	234 7465	Pune	-	+91 8600149216
Guwahati	-	(0361)	234 2866 / +91 88110 14878	Vizag	-	+91 99594 88807 / (0891) 6635637
Hyderabad	-	(040)	6456 0505 / 4007 2529 / 6460 0407	Bangladesh	-	+88 01734 675252
Lucknow	-		+91 738808880			

Important Note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation or information given by it.

E-mail: enquiry.india@fosroc.com

CIN: U02411KA1980PTC004053



constructive solutions

www.fosroc.com