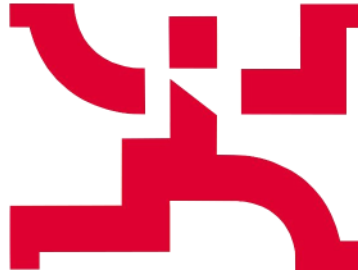


FOSROC



Constructive Solutions

“Latest Trends & Technologies In Waterproofing”

BS Nagaraj – Sr. Manager Waterproofing, sealant & Anchoring system

Important information

- **Please switch your microphone & mobile to mute**
- **Do not use video webcam**, only use Audio (to protect good bandwidth)
- **Please unmute** in case you need any clarification/ to ask questions while the training is being delivered
- **At the end of the secession we can have exclusive Q/A secession if further clarification required**



BS Nagaraj – Sr. Manager Waterproofing, sealant & Anchoring system





Specialists in

Constructive Solutions

Fosroc is a world leader in the delivery of tailored Constructive Solutions for virtually any type of construction project, combining high quality products, expert technical support, customer service and innovation.

At the cutting edge of chemical technology, Fosroc specialise in sealants, waterproofing, concrete repair, grouts and anchors, concrete admixtures and protective coatings.

With a comprehensive range of products and a highly developed global network, Fosroc offers a high quality solution for virtually any job, whatever the scale.

Why Fosroc



Products

Fosroc has an extensive range of products to meet the ever increasing challenges of the construction industry, specializing in bespoke package solutions.

Quality

We operate to strict quality standards to ensure that our customers are constantly provided with the high performance products that they expect from **Fosroc**

Technology

Fosroc invests significantly in the development of new products and innovative solutions. **Fosroc** aims to lead the market in application friendly solutions

Knowhow

Fosroc provide support throughout the lifecycle of a construction project with dedicated technical and specification teams that ensure high performance, sustainable and cost saving solutions.



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With our in-house expertise and specialist technology partners, we're well positioned to respond to the specific requirements of our clients. By being involved early in the process at the design and specification stage, we can spot opportunities to optimise efficiencies, manage risks and minimise costs across the project. All supported by ongoing training and development to ensure we achieve the world-class quality we're known for delivering.



1

Fully equipped Technology Centre in Bangalore, India and KL, Malaysia

2

Product Application experts in our operating companies

3

Broad product range supported by local and global specialists

4

Innovative tailored solutions that boost the efficiency and durability of a building and infrastructure.

Our Accreditations

Our superior product standard is reflected through our attention to meeting industry standards and gaining certification via accreditations.



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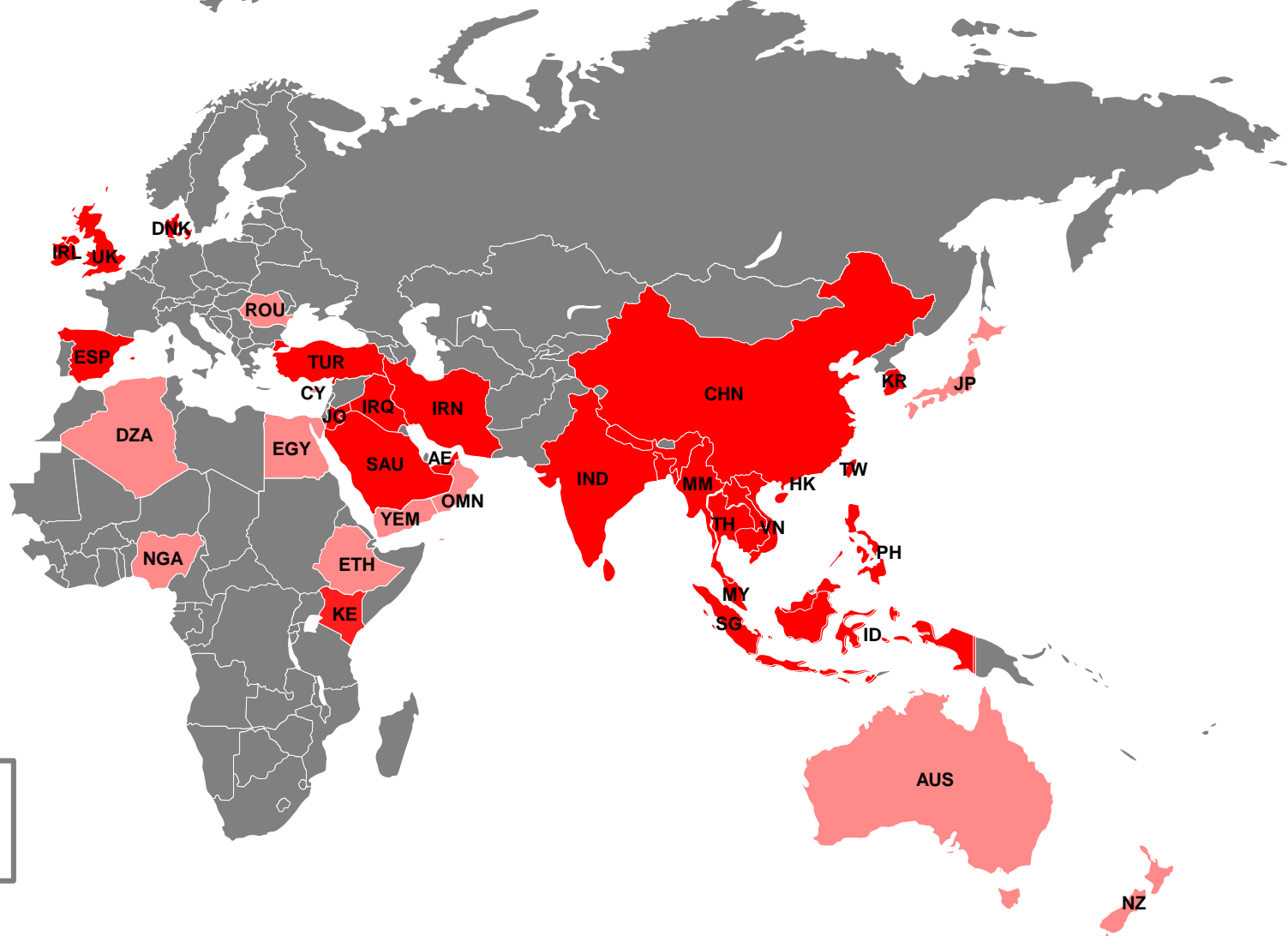
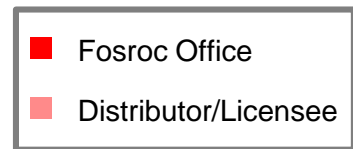
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International Presence



Fosroc today:

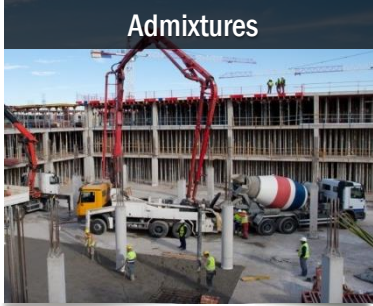
- Fosroc Global Trading serves our Seventy export markets
- Operations in 20 countries (18 Manufacturing and two trading companies)
- Manufacturing Licensees in 5 countries
- Over 1,900 employees worldwide

Our Solutions

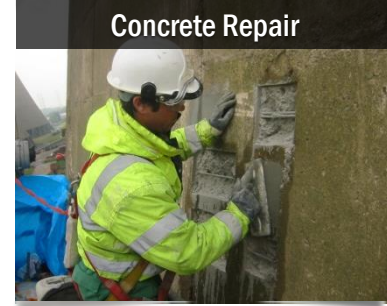
Adhesives



Admixtures



Concrete Repair



Joint Sealants



Waterproofing



Grouts & Anchors



Cement Additives



Protective Coatings



Industrial Flooring



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Objectives of today's Webinar

- Objective is to get clear understanding:
 - Requirement of waterproofing for below ground & above ground RCC structures
 - Latest Trends & Technologies In Waterproofing offered by Fosroc for each of these area
 - Application methodology for each of these system
 - Case histories



Waterproofing - Various Solutions

Torch on



Spray applied



Liquid applied



Self Adhesive



Pre applied



Loose Laid



Roofing Membranes



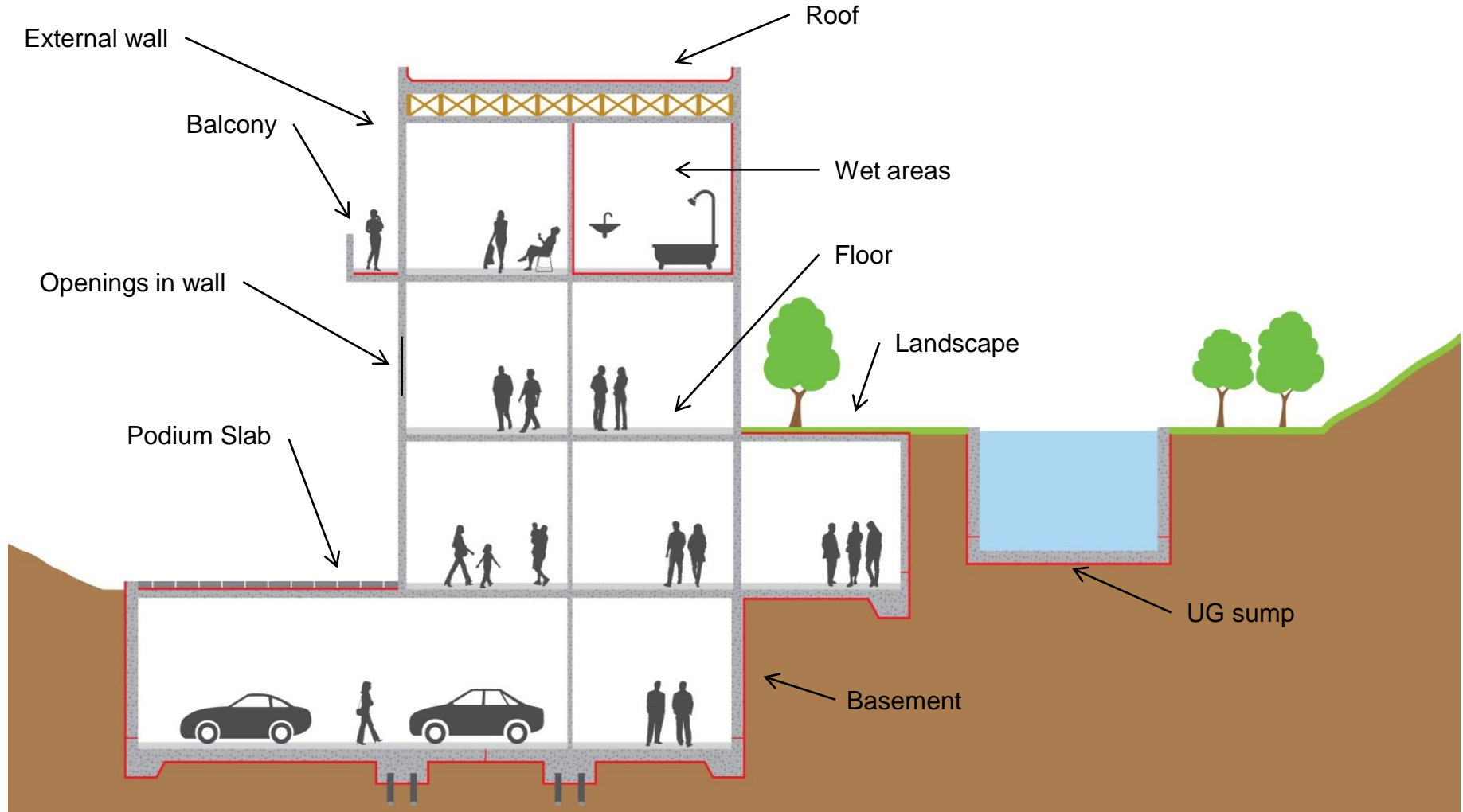
Re injectable hose



Swell bars



Typical area's in a Building which needs waterproofing



Constructive solutions to building segment

- Below ground applications
- Above ground applications

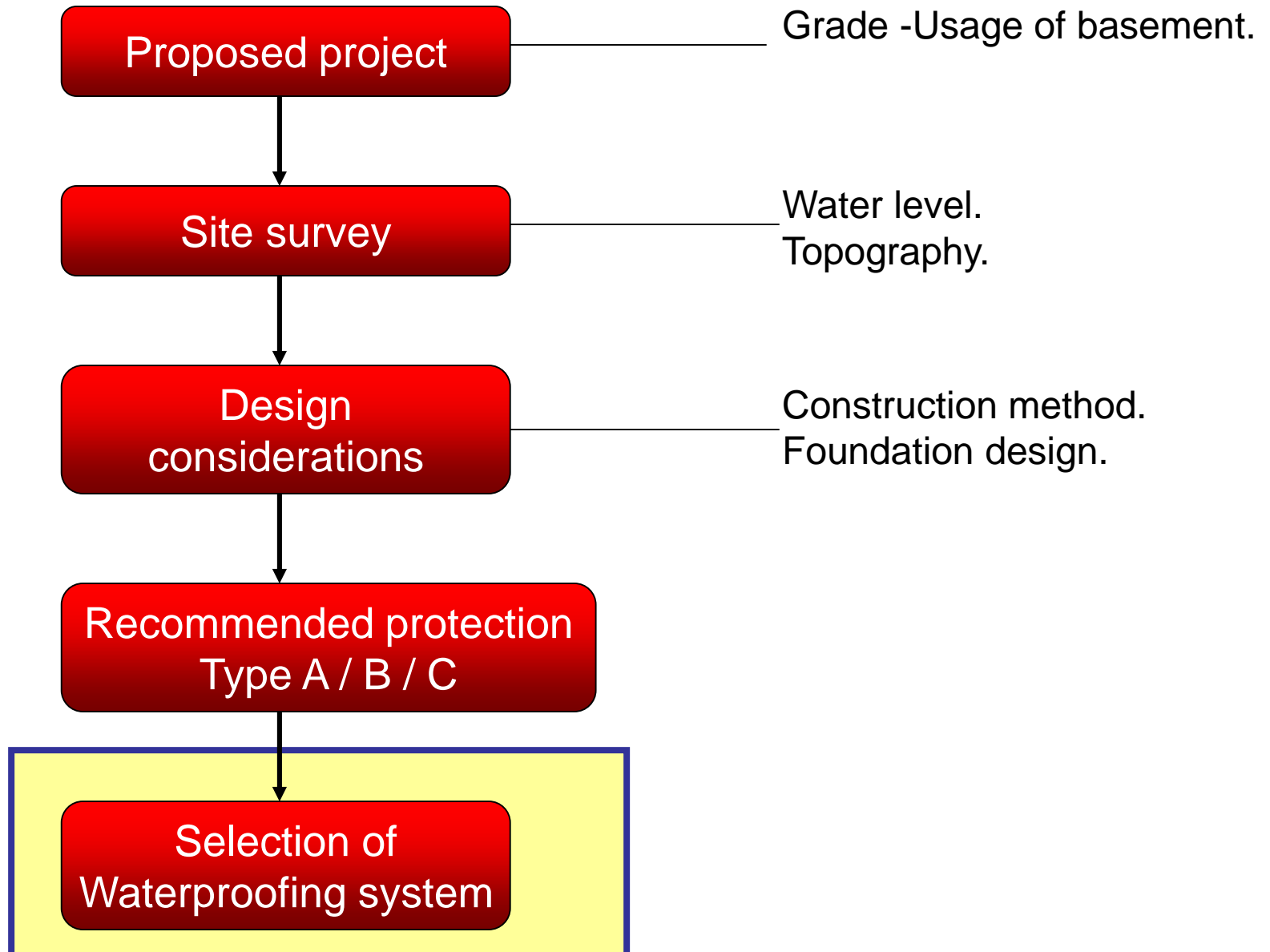


Below Ground - BS8102/IS 16471 Guidelines




- Selection of waterproofing system



constructive solutions



BS8102:2009 Grades

Grade	Use of structure	Performance level
1	 <ul style="list-style-type: none"> • Car parking • Plant rooms (exc electrical) • Workshops 	<ul style="list-style-type: none"> • Some seepage and damp areas tolerable • Local drainage might be necessary
2	 <ul style="list-style-type: none"> • Plant rooms and workshops requiring a drier environment than Grade 1 • Storage areas 	<ul style="list-style-type: none"> • No water penetration acceptable • Damp areas tolerable; ventilation might be required
3	 <ul style="list-style-type: none"> • Ventilated residential and commercial areas including offices, restaurants etc • Leisure centres 	<ul style="list-style-type: none"> • No water penetration acceptable • Ventilation, dehumidification or air conditioning necessary

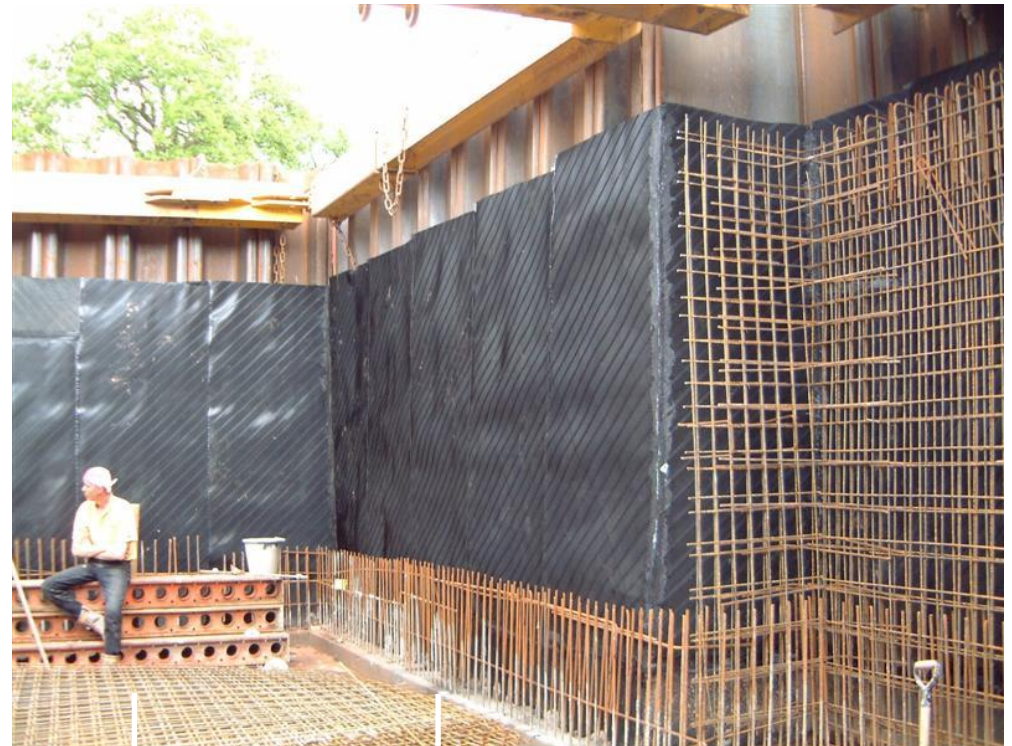


BS8102 / CIRIA 139 – main considerations



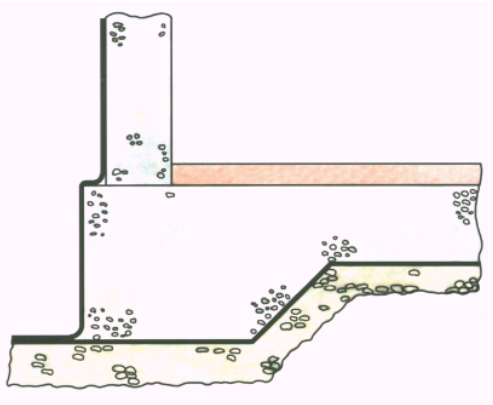
constructive solutions

- Almost all basement structures are likely to be subjected to water pressure at some period of their life
- Provision for at least 1m of hydrostatic pressure
- 3 main generic waterproofing system options

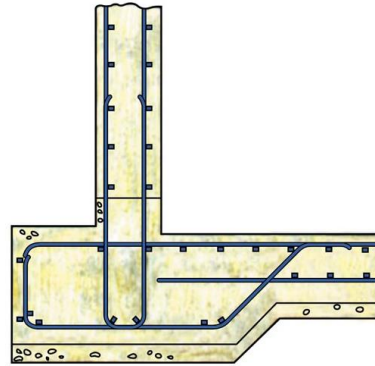


Generic waterproofing options

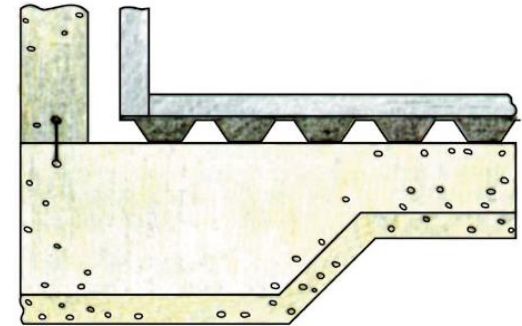
Type A: Tanked



Type B: Integral

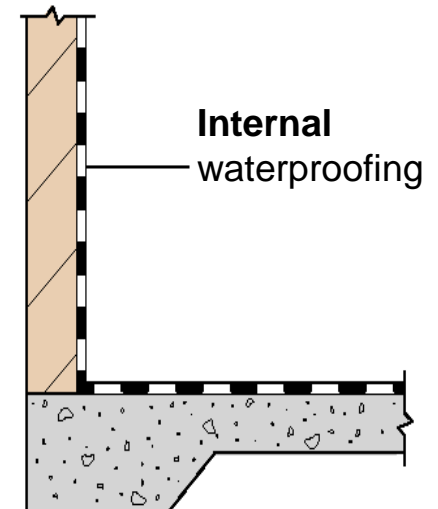
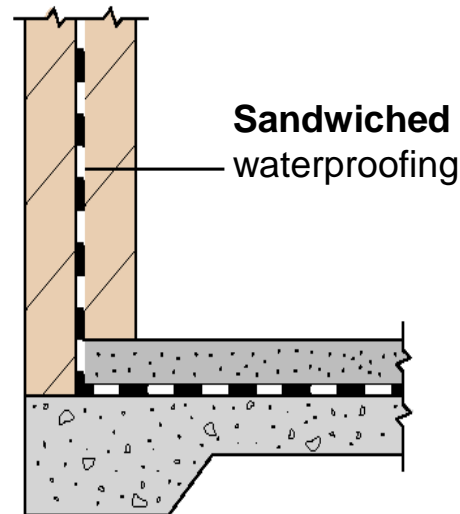
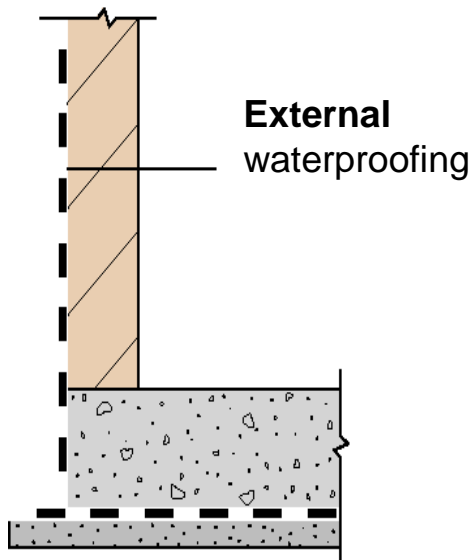


Type C: Drained



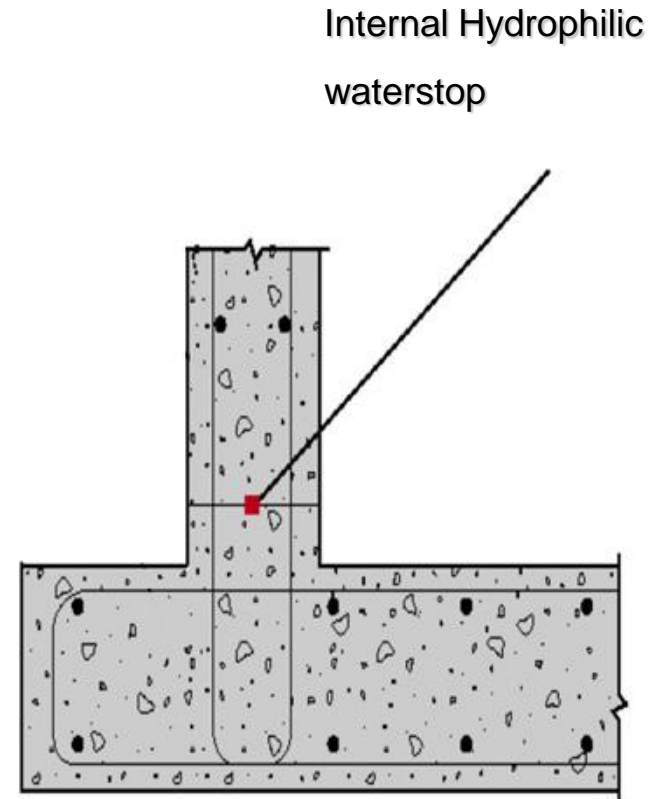
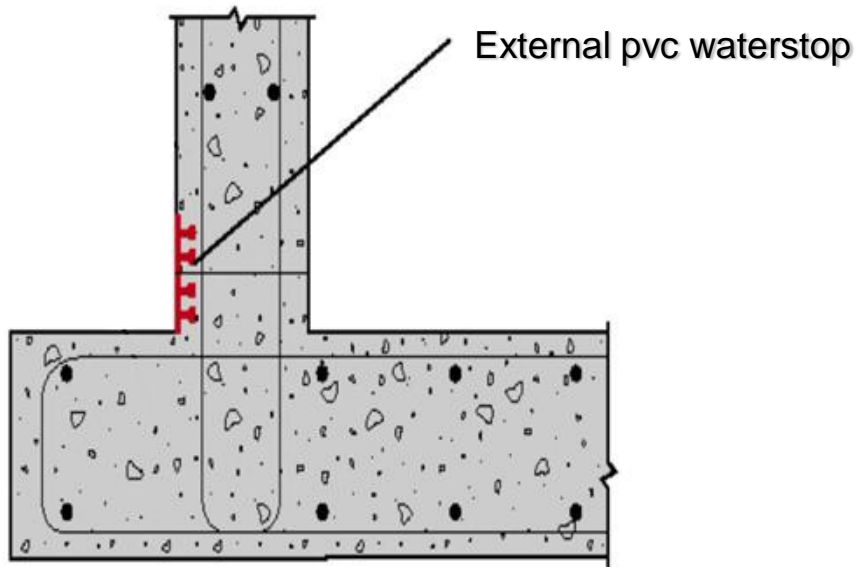
Type A : Tanked

- Protection is totally dependant on a continuous barrier system applied to the structure



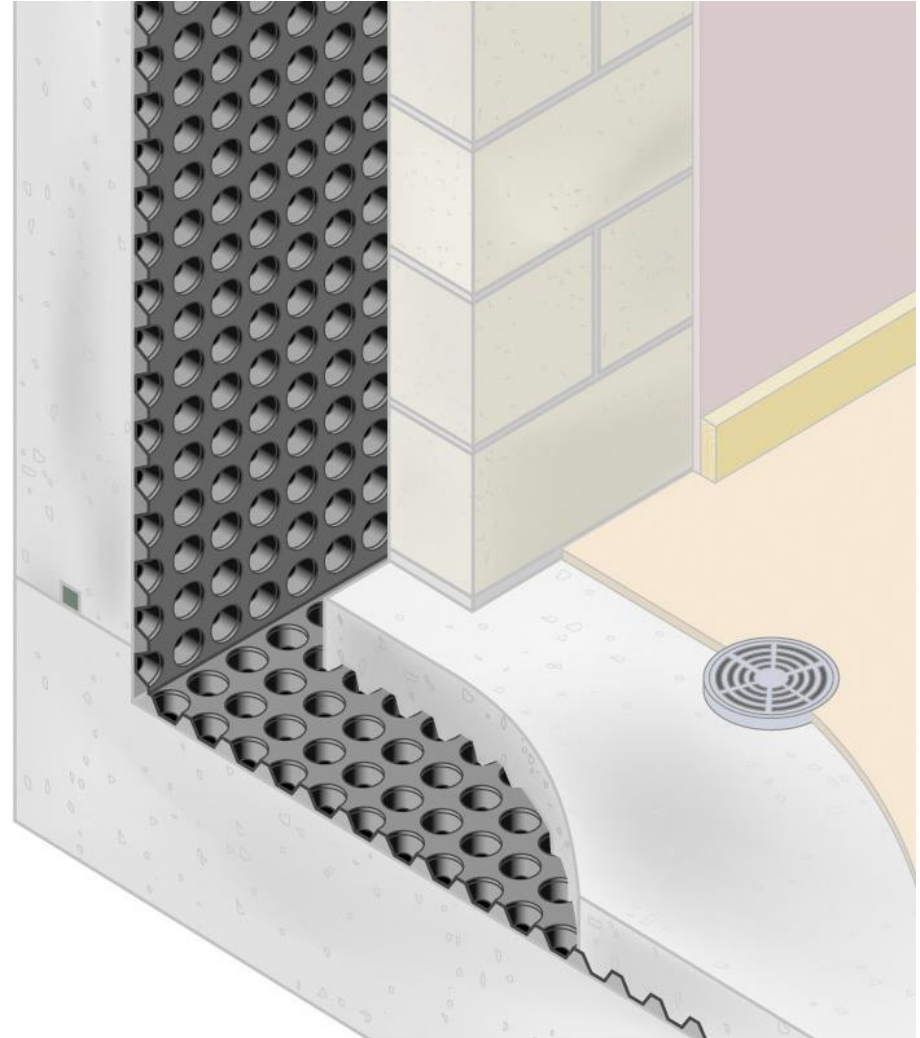
Type B : Integral

- Protection is provided by the structure
 - Reinforced concrete designed with minimal cracking
 - Waterstops at every joint



Type C : Drained

- Reinforced concrete design to minimise water penetration
- Seepage collected and discharged within the cavity



Below ground waterproofing



Summary of Requirements

- Resistance to high water table
- Resistance to aggressive ground salts & chemicals
- Confirming to BS 8102
- Compatible for application in wet area
- Resistance to roots
- Easy & quick to install
- Withstand differential settlement
- Protection screed not mandatory
- Crack bridging
- Durable



Below ground waterproofing – Product range



- ▶ **Pre-applied mechanically bonded membrane
Proofex Engage (BBA Approved)**
- ▶ **Pre-applied pressure sensitive membrane
Fosroc Membrane HDPE P**
- ▶ **Loose laid PVC membrane
Proofex PGP**
- ▶ **SBS Cross laminated HDPE Self adhesive
membrane
Proofex 3000**



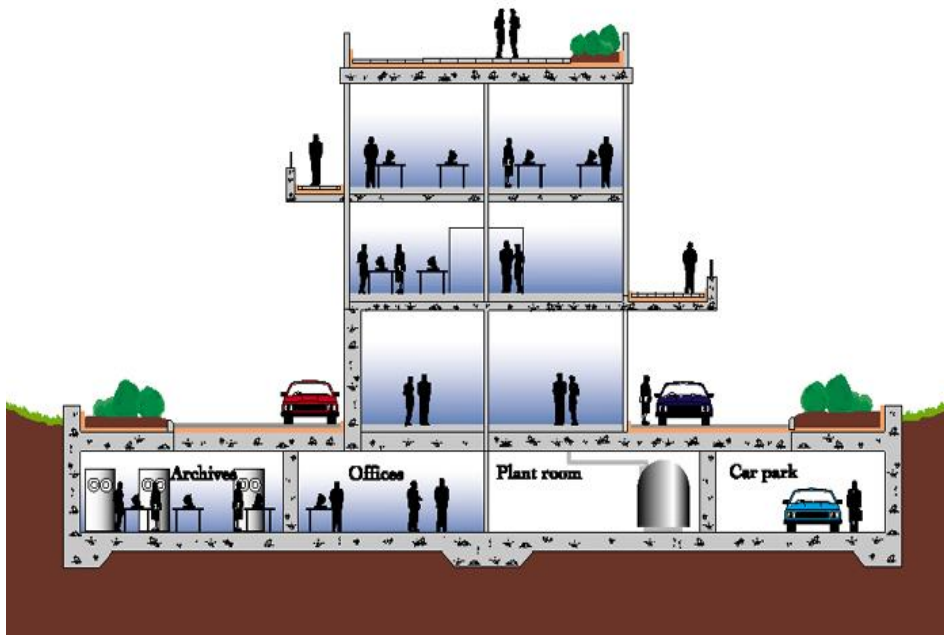


Below Ground Waterproofing

Pre-applied mechanically bonded membrane

Belowground construction

■ Without working space

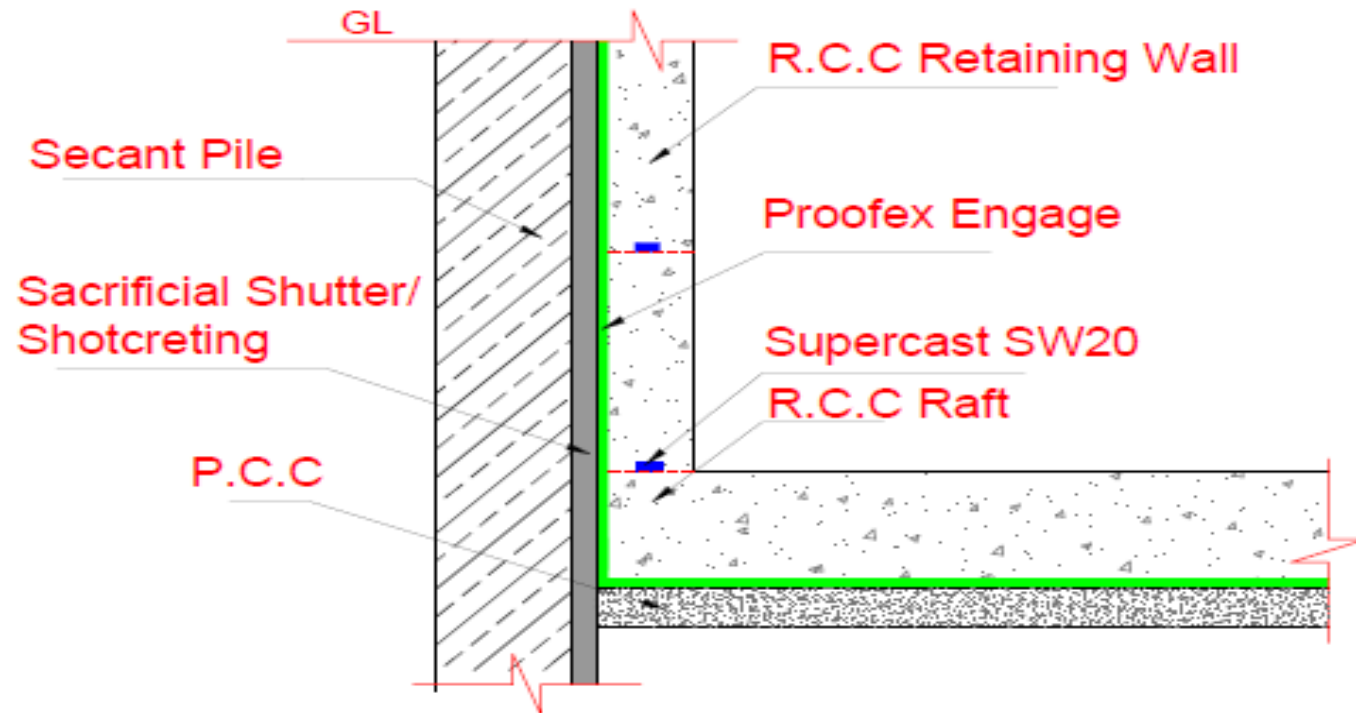


■ With working space



System Build up (Without working space)

Proofex Engage for Confined Area



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FAX: +91 8022281510
WEB SITE: www.fosroc.com

Drawing Name:

Waterproofing Detail for Proofex Engage



Date: 08/01/2020
Prepared by: Vinay



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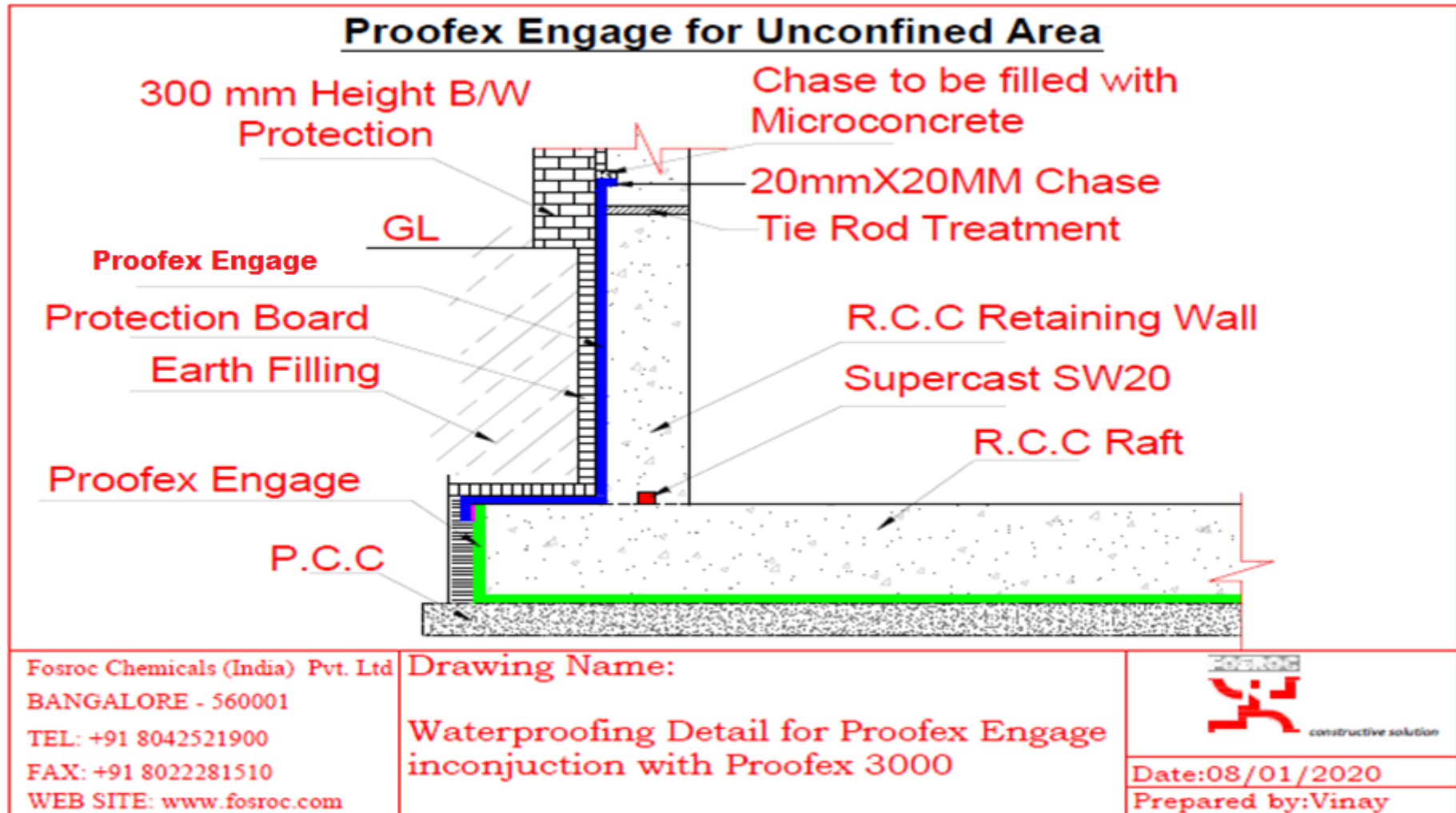
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System Build up (With working space)



Mechanically bonded system - Value Proposition

1

**Available in Rolls of
1.15mt X 33.1mt X 4mm**



- Pre formed membranes - Factory manufactured – Ensures quality & uniform thickness
- Faster rate of application – Can easily cover 500 to 1000 sqmt/day
- Saves time – Large area can be covered in short span, time saved is money saved
- All placing of re bars immediately after unrolling the membrane – Allow other activity to start quickly

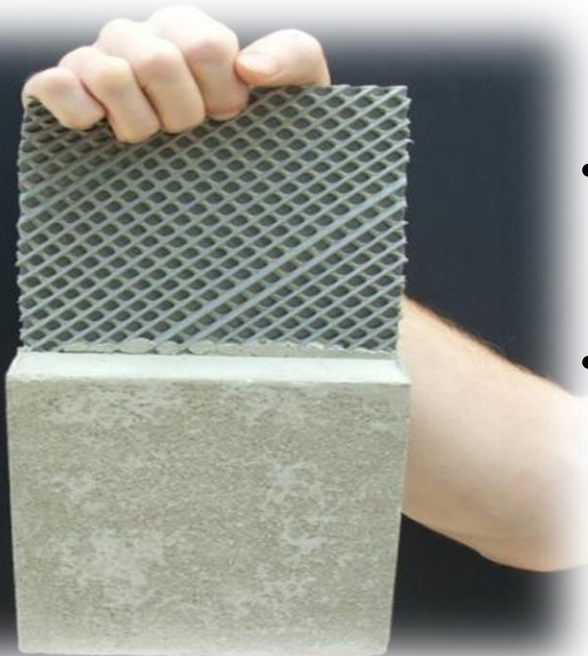


Mechanically bonded system - Value Proposition

1

2

Fully Bonded System



- Fully bonded – Prevent lateral migration of water
- Resistant to aggressive ground salts & chemicals – Enhance durability of the system



Mechanically bonded system - Value Proposition

1

2

3

Non Water Tracking

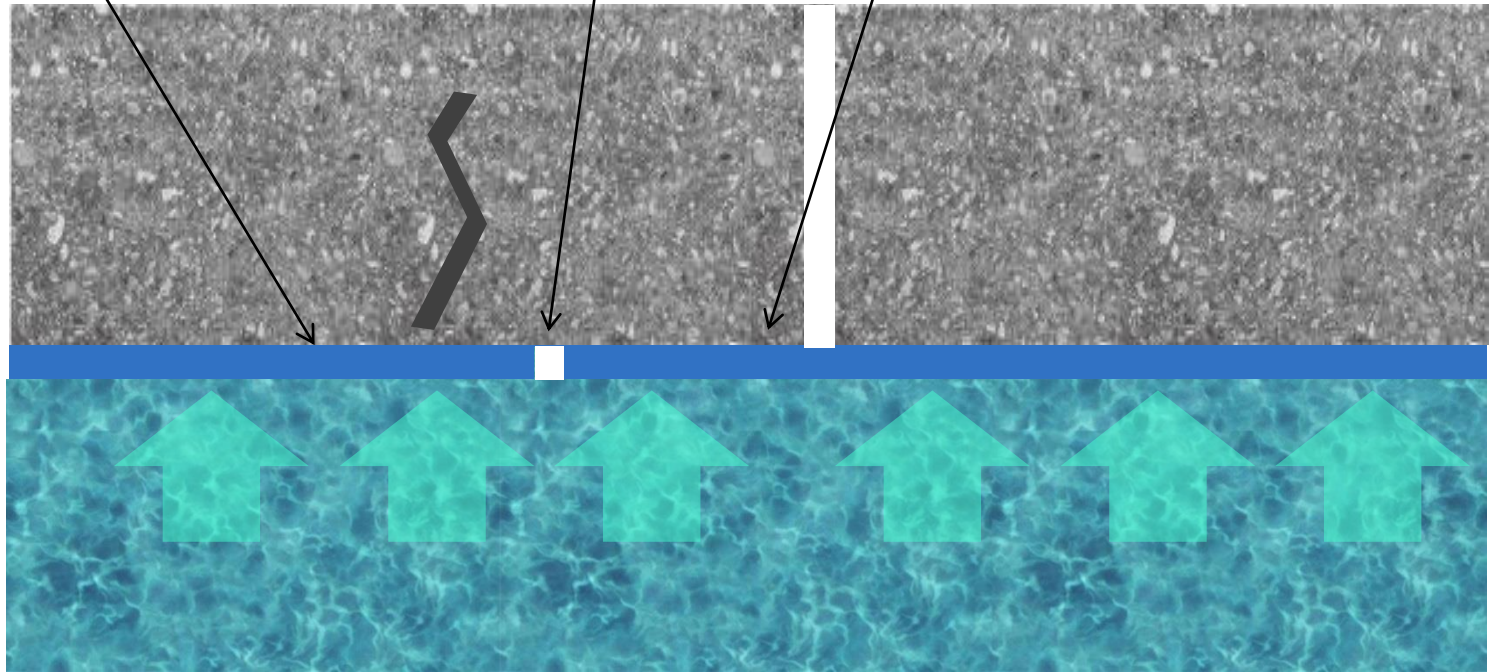
Proofex Engage
(adhered to
structure)

Structural
Slab

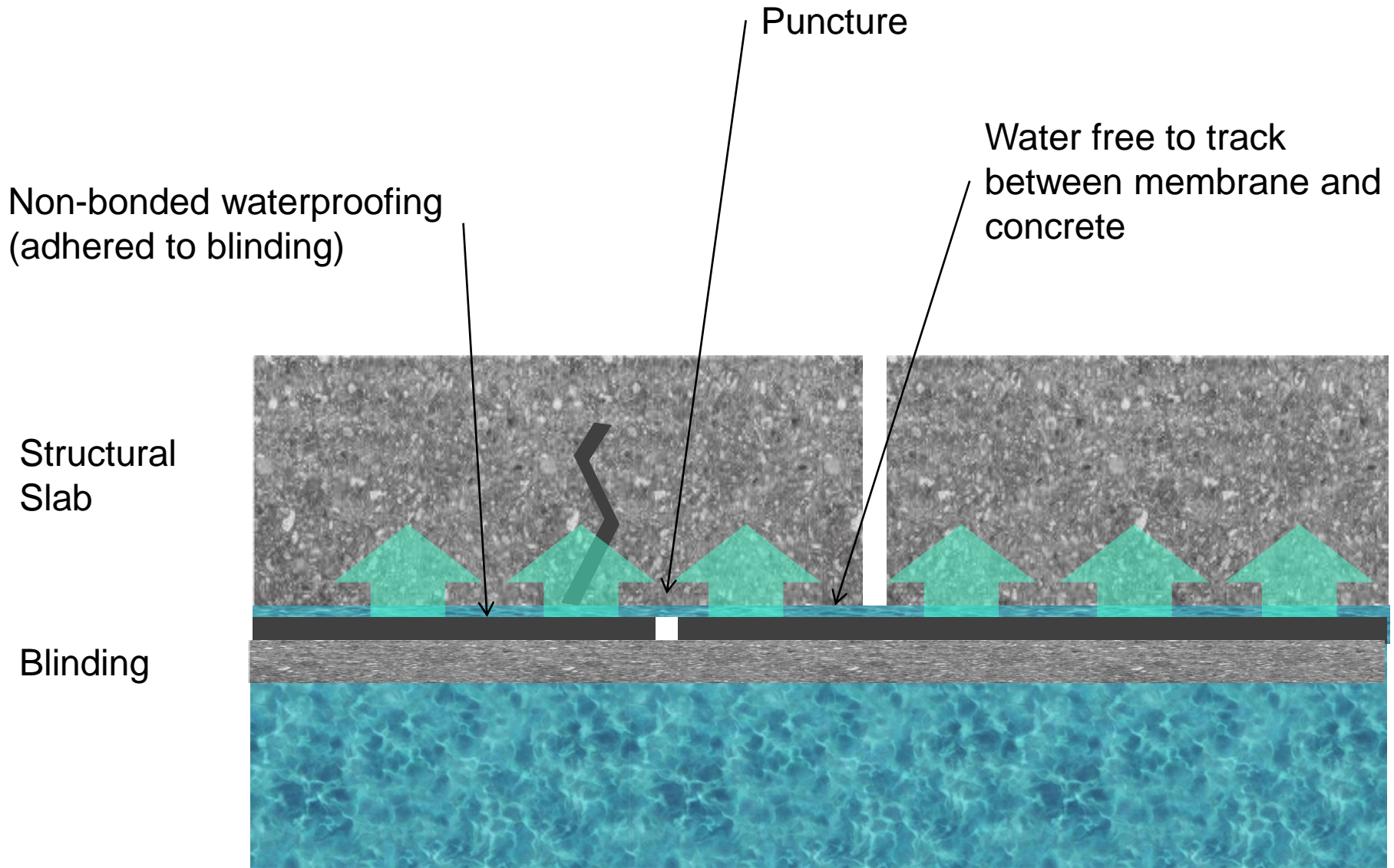
Blinding

Puncture

Water does not track
between membrane and
concrete



Mechanically bonded system - Value Proposition



Mechanically bonded system - Value Proposition

1

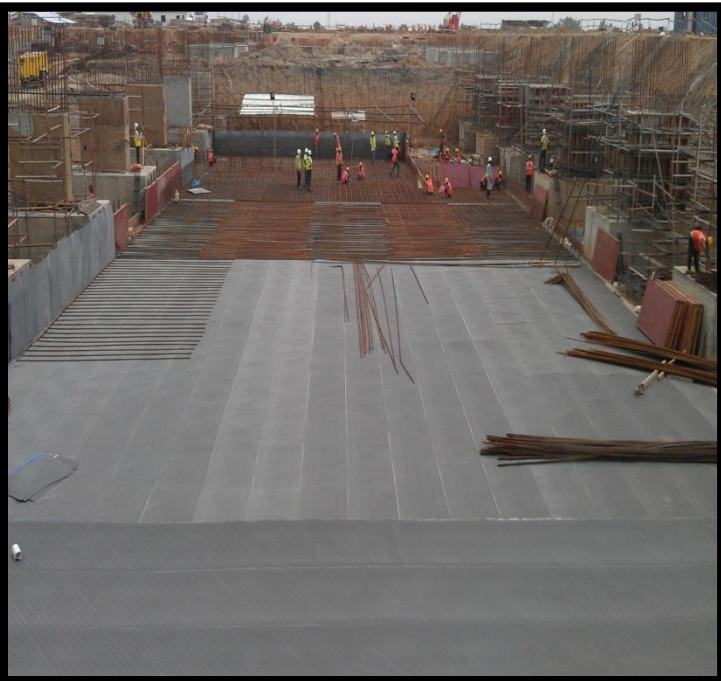
2

3

4

**Eliminate Protection
screed**

- Allow re-bars to be place directly on the membrane – Cost saving & time saving
- Vey high puncture resistance- With stand abuses during installation & execution



Mechanically bonded system - Value Proposition

1

2

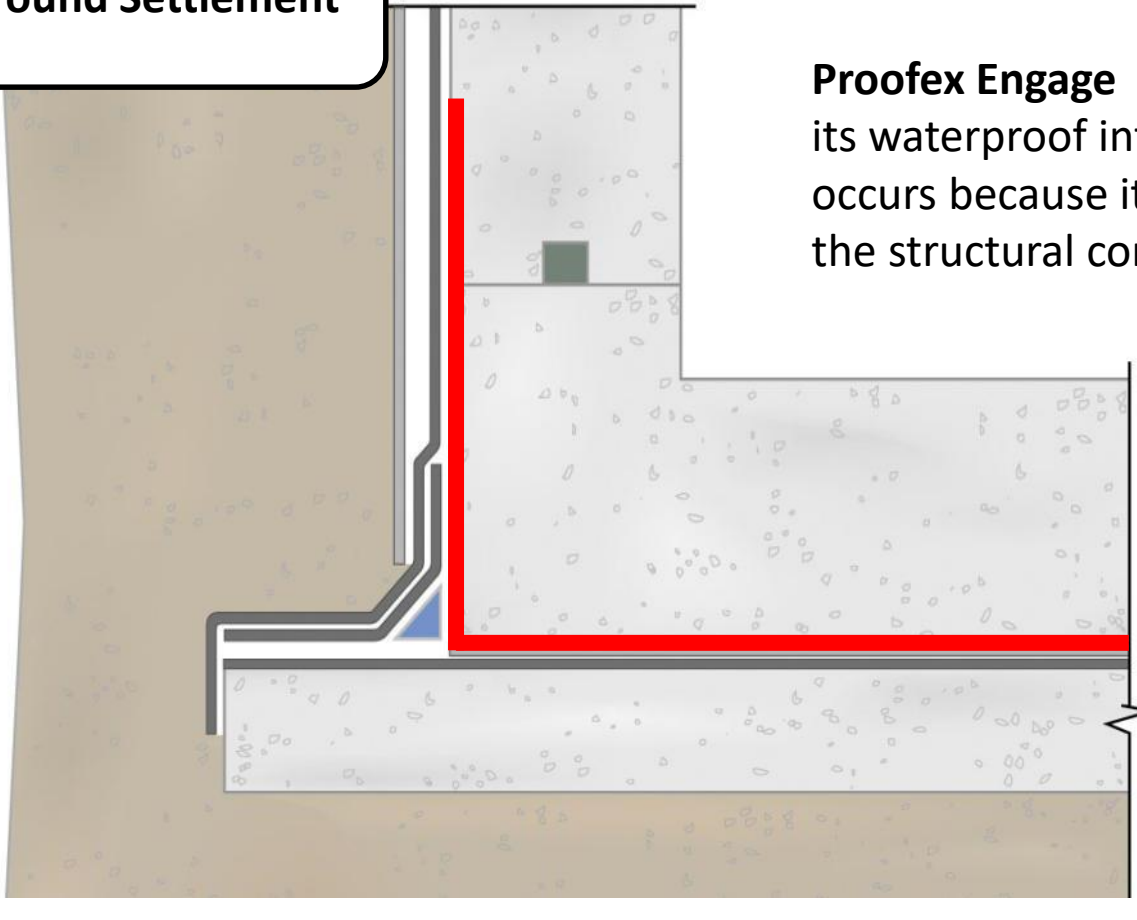
3

4

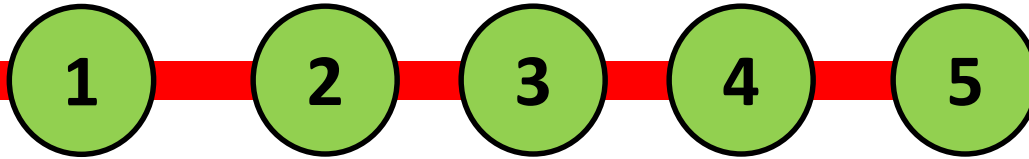
Ground Settlement

Proofex Engage maintains its waterproof integrity even if settlement occurs because it is chemically bonded to the structural concrete.....

voids due to ground settlement



Mechanically bonded system - Value Proposition

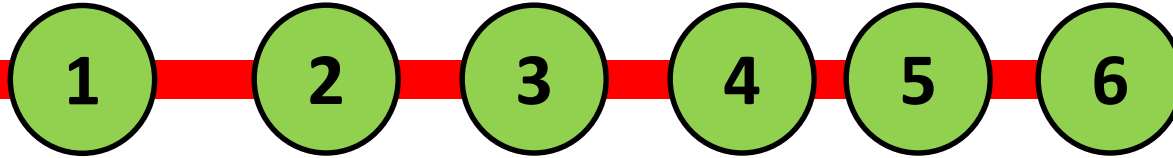


Green Product

- Zero VOC - Green product, no damage to the environment
- Credit Rating – Enable to claim green points in case opting for green building certification



Mechanically bonded system - Value Proposition



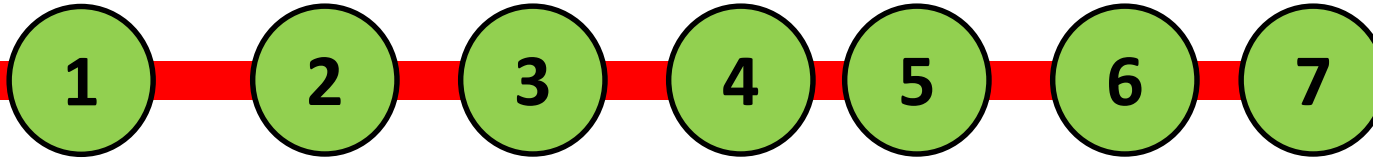
Crack bridging



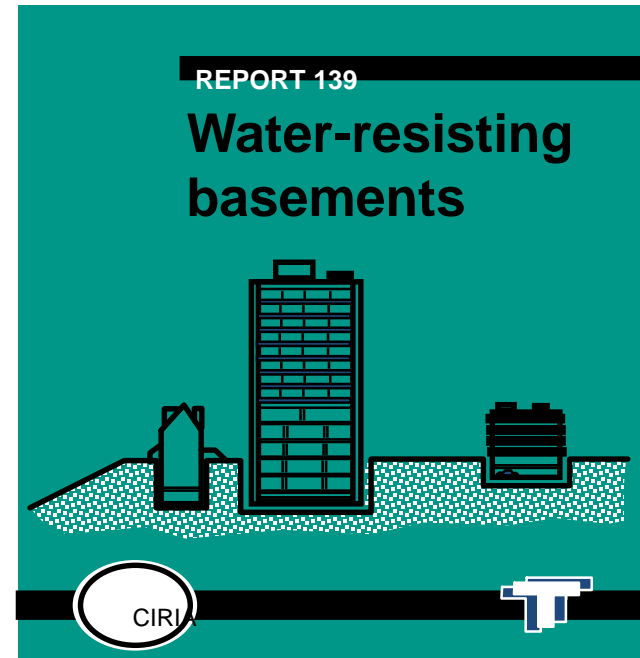
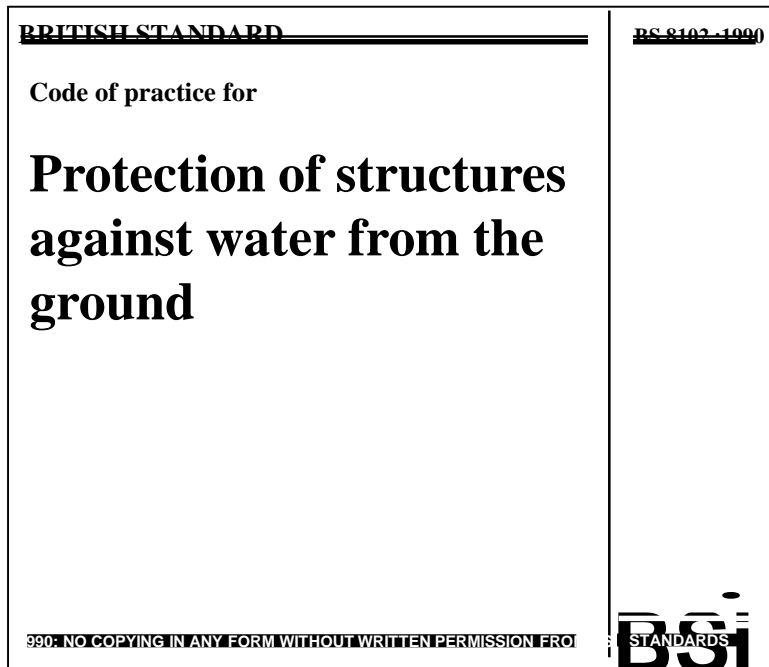
- Accommodates cracks $> 3\text{mm}$ – Minimize chances of product failure & ensure water tightness
- Enhance Durability & sustainability of the structure



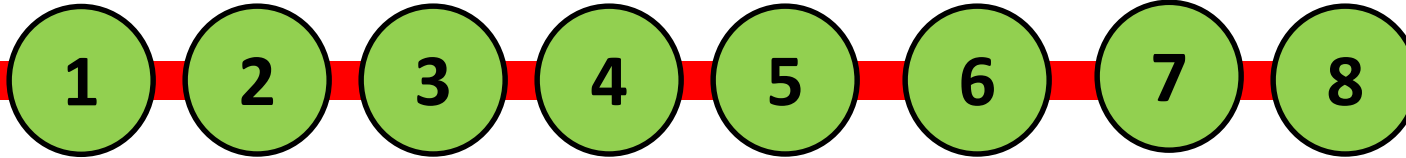
Mechanically bonded system - Value Proposition



Certifications



Mechanically bonded system - Value Proposition



Certifications

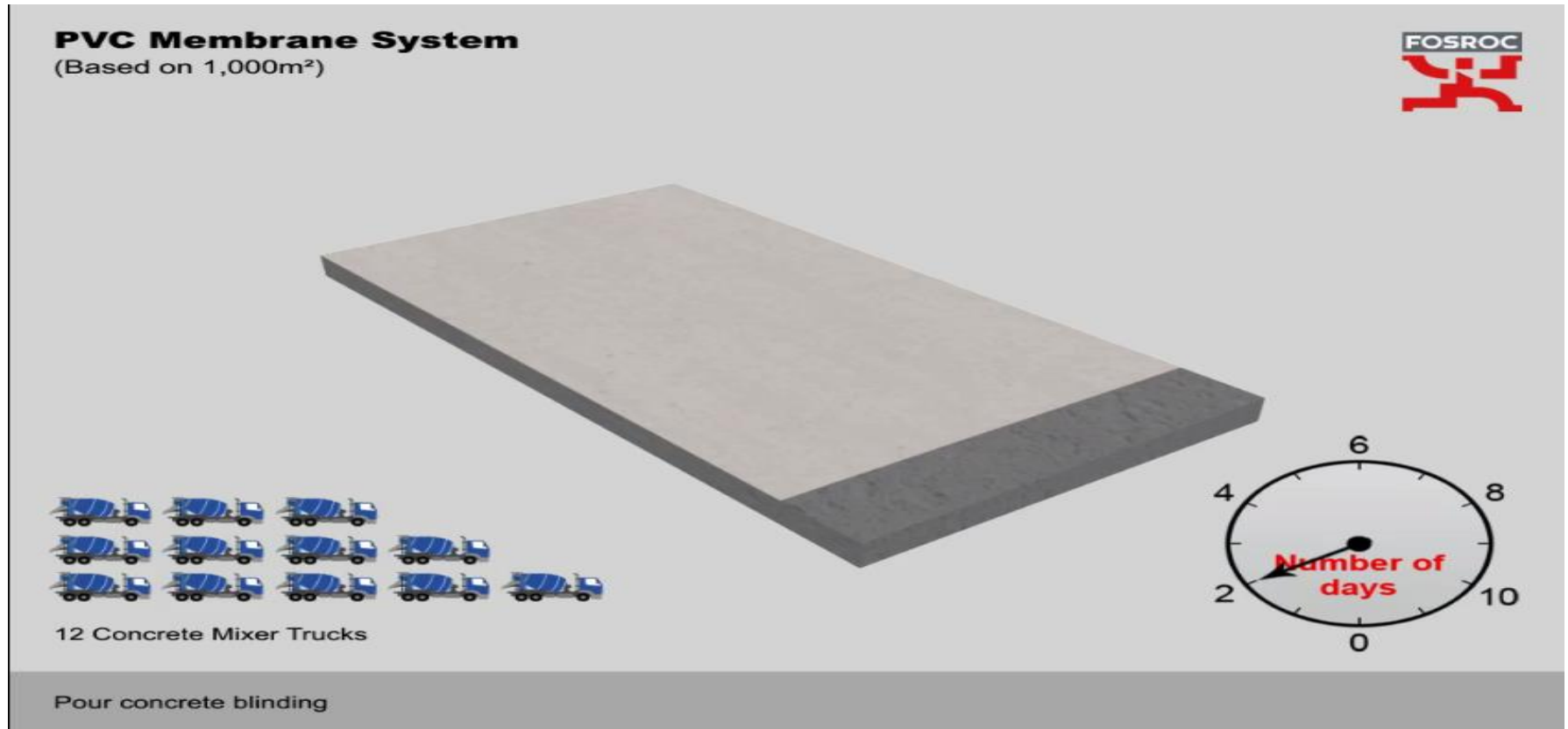
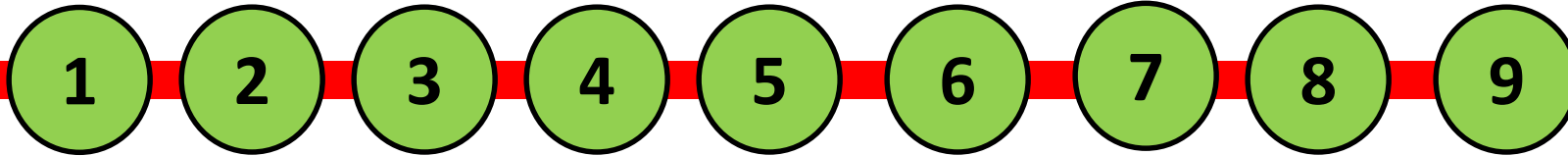


**Durability test confirming
to Service life of 125 Year
BS EN 13251:2016 and BS
EN 13252:2016**

S



Mechanically bonded system - Comparison with PVC Membrane System



Proofex Engage at Ford India, Sanand - Gujarat



Proofex Engage at BVR Mall - Vijayawada



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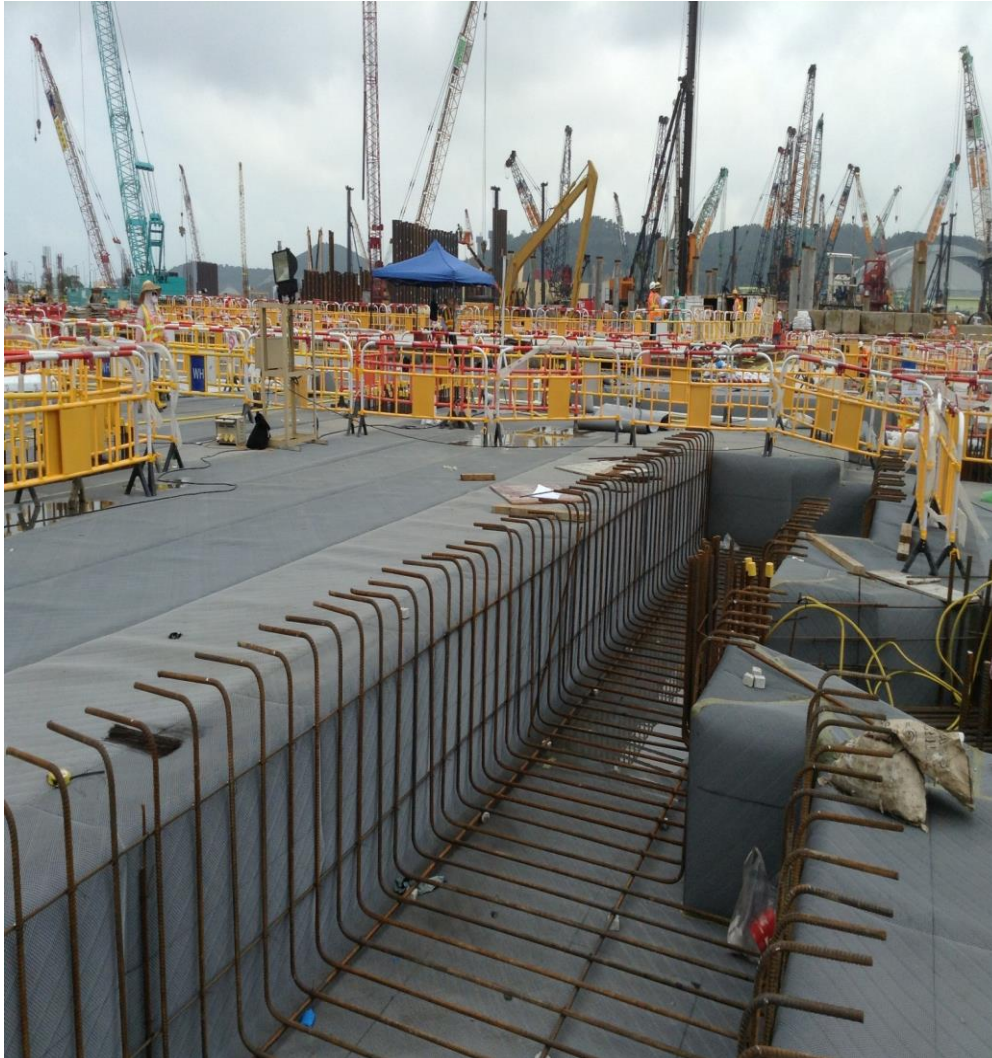
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Job reference – Winn Macau Hong Cong



110,000m² of Proofex Engage with Polyurea WCS, Supercast PVC and Proofex 3000MR



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SBS Cross laminated HDPE Self
adhesive membrane

SBS Cross laminated HDPE Self adhesive membrane Value Proposition

1

Fully Bonded System



- Fully bonded – Prevent lateral migration of water
- Resistant to aggressive ground salts & chemicals – Enhance durability of the system



SBS Cross laminated HDPE Self adhesive membrane

Value Proposition

1

2

**Available in Rolls of
1.0mt X 20.0mt X 1.5mm**



- Pre formed membranes - Factory manufactured – Ensures quality & uniform thickness
- Faster rate of application – Can easily cover 500 to 1000 sqmt/day
- Saves time – Large area can be covered in short span, time saved is money saved
- All placing of re bars immediately after unrolling the membrane – Allow other activity to start quickly



SBS Cross laminated HDPE Self adhesive membrane

Value Proposition

1

2

3

Certifications



**Durability test confirming
to Service life of 125 Year
BS EN 13251:2016 and BS
EN 13252:2016**

S





Below Ground Waterproofing
Pre applied pressure sensitive fully
bonded system

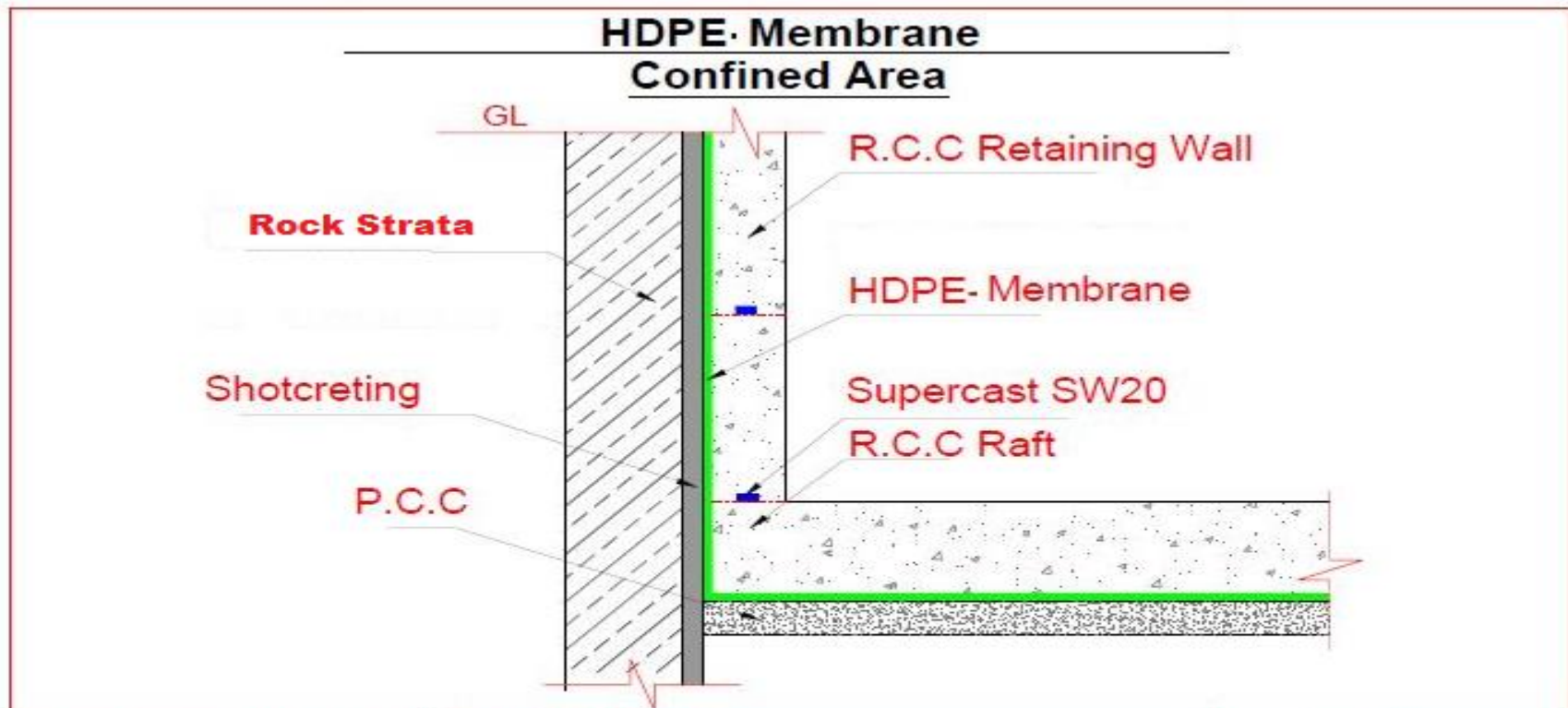
Pre applied pressure sensitive fully bonded system

- Area of waterproofing application.
 - ▶ Deep basements > than two level below ground with very high water table, resistance to ground salts
 - ▶ Very high service life



Pre applied pressure sensitive fully bonded system

■ Without working space



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FAX: +91 8022281510
WEB SITE: www.fosroc.com

Drawing Name:

Waterproofing Detail

Pre applied pressure sensitive fully bonded system

■ With working space

Fosroc Membrane HDPE-P Standard for Unconfined Area



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BANGALORE - 560001
TEL: +91 8042521900
FAX: +91 8022281510
WEB SITE: www.fosroc.com

Drawing Name:

Waterproofing Detail for Fosroc
Membrane HDPE-P Standard in
conjunction with Proofex 3000



Date: 09/12/2019
Prepared by: Vinay



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Pre applied pressure sensitive fully bonded system

1

Fully Bonded System



- Fully bonded – Prevent lateral migration of water
- Resistant to aggressive ground salts & chemicals – Enhance durability of the system
- Service life > 15 years



Re-bars placed directly Fosroc membrane HDPE P



constructive solutions



Vertical Application of Fosroc membrane HDPE P



constructive solutions



Vertical Application of Fosroc membrane HDPE S



constructive solutions

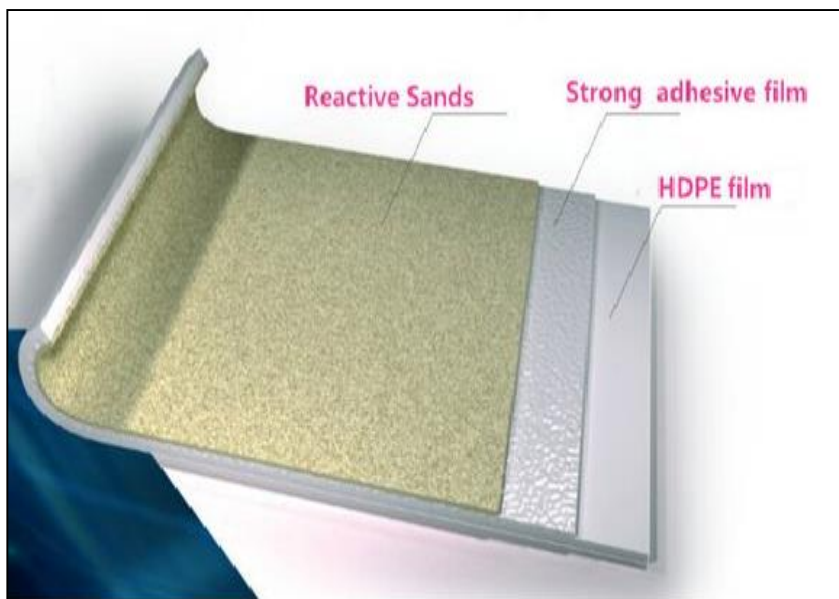


HDPE membrane & Variants – Product Positioning

Product Variants – Standard version (Tensile strength >21Mpa)	Product positioning (Building Segment)
Fosroc membrane HDPE P 1.2 mm thick (Sanded)	Below ground > 2 basement> & no aggressive ground water chemicals
Fosroc membrane HDPE P 1.5 mm thick (Sanded)	Below ground/>3 basement/ no aggressive ground water chemicals
Fosroc membrane HDPE P (Smooth)RF 1.2 mm thick	Below ground > 2 basement> & no aggressive ground water chemicals
Fosroc membrane HDPE PP (Smooth)RF 1.5 mm thick	Below ground/>3 basement/ no aggressive ground water chemicals
Fosroc membrane HDPE S 1.2 mm thick (Self adhesive for retaining wall)	Below ground > 2 basement> & no aggressive ground water chemicals
Product Variants – Premium version (Tensile Strength >27Mpa, UV & Resistant to aqueous solution)	Product positioning (Industry & Infra)
Fosroc membrane HDPE P 1.2 mm thick (Sanded)	Below ground > 2 basement> & presence of Ground water chemicals, UV resistance
Fosroc membrane HDPE P 1.5 mm thick (Sanded/)	Below ground > 3 basement> & presence of Ground water chemicals, UV resistance

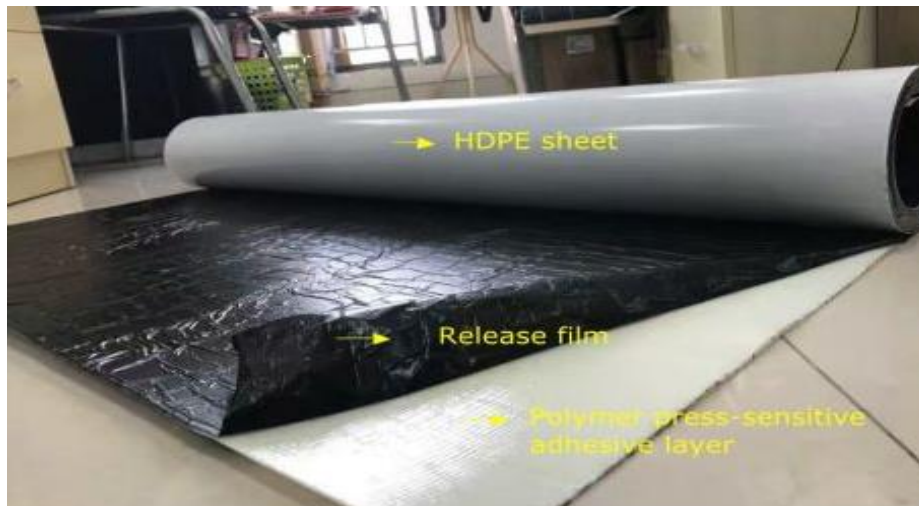


Fosroc membrane HDPE Variants



Fosroc membrane HDPE P

Fosroc membrane HDPE P (Smooth) RF



Fosroc membrane HDPE P

Major Projects Won

Project Name	Quantity	Executed in
Agartala Airport, Agartala	25000 M ²	2018
IBIS Hotel, Bangalore	4830 M ²	2018
Primvavera, Goa	2000 M ²	2018
St.Xavier University, Bhubaneshwar	5915 M ²	2018
Rajhans Developers, Surat	3000 M ²	2018
Pentagon Mall, Patna	3000 M ²	2018
Sagar Developers, Pune	3000 M ²	2018
Ambience valley project	3000 M ²	2018
Muthoot Hospital, Dwarka	6000 M ²	2019
Jharkhand Bhavan, Delhi	2000 M ²	2019
BJP Bhavan, Delhi	5000 M ²	2019
Navsena Bhavan, Delhi	7000 M ²	2019
Jharkhand Bhavan, Delhi	3000 M ²	2019
Nagpur Metro, Nagpur	2500 M ²	2019
Eldeco, Delhi	6000 M ²	2019
Mayfair Hotel, Kolkata	25000M ²	2019
Microsoft, Hyderabad	22500M ²	2019
Total	128 745 M ²	



Below Ground Waterproofing -One stop waterproofing solution from Fosroc

Package solution



- Fosroc Membrane HDPE P – Below the raft
- Fosroc Membrane HDPE S – Retaining wall
- Nitocote CM210- UG Sump
- Expoband One -Expansion joints
- Supercast SW20/Predimax Injection hose- Construction joints
- Thioflex 600 – Expansion/Construction Joints in drive way
- Trafficguard UR150 – Carpark deck coatings



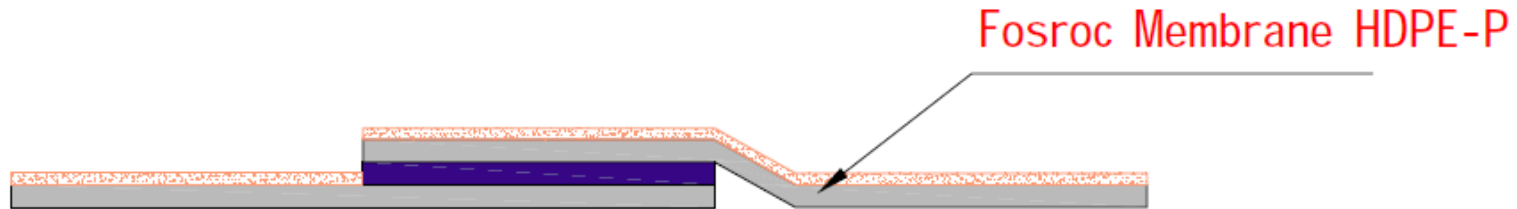
Application of the System



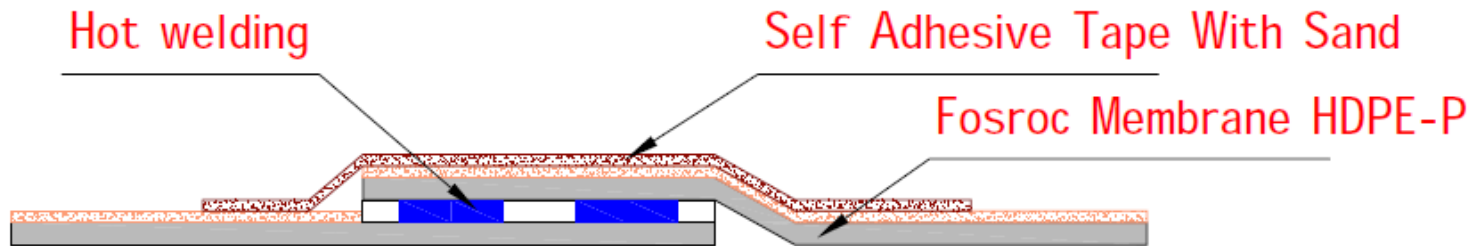
Detailing – Side laps



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Membrane Side Laps



Hot Welding Over Lapping

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SIDE LAPS

Drg: FS-HDPE-01

Date: 07-12-2017

Prepared by :
Chethan raj

PROJECT:

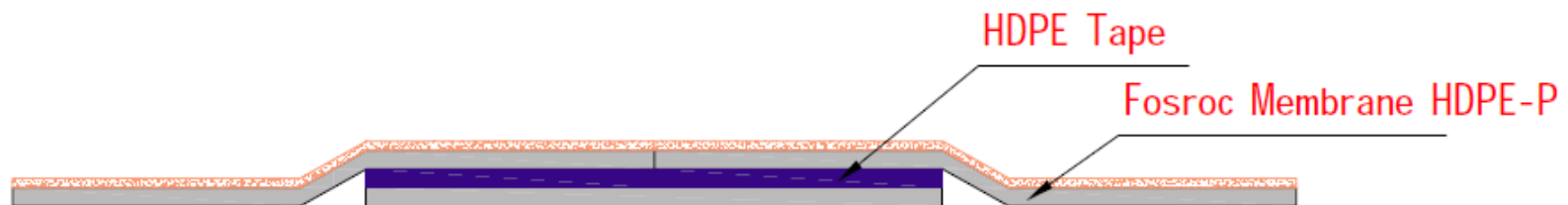
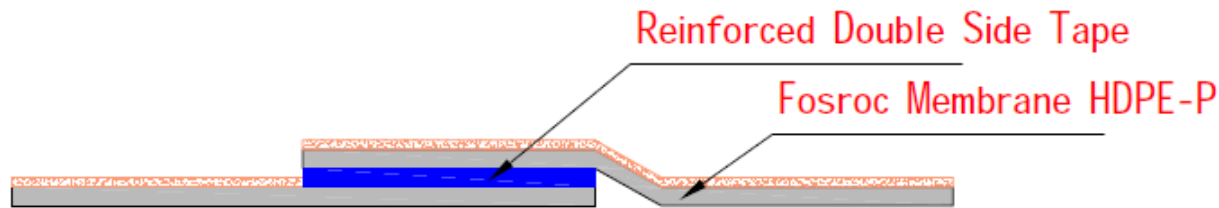
CONSULTANT:

CONTRACTOR:

Detailing – End Laps



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END LAPS

Drg: FS-HDPE-P-02

Date: 07-12-2017

Prepared by :
Chethan raj

PROJECT:

CONSULTANT:

CONTRACTOR:

Few Major References



Eldeco Commercial complex – Delhi, 10000sqmt



Muthoot Hospital, Delhi – 13000 sqmt



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Few Major References



Agartala airport – 35000 sqmt



St. Xavier University Bhubaneswar - 10000 sqmt



Cyberthum Commercial complex ,Noida– 20000 sqmt Microsoft , Hyderabad – 24000 sqmt



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Case History



Agartala Airport Waterproofing

Value of the work : Basement area 35000 sqmt & Value 160 Lakhs
Applicator ; In-house by NCC



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Pile Treatment

■ Fosroc Membrane HDPE – P

- ▶ Pile encapsulation with Supercast EPT – 1800 piles of 1mt Dia



Fosroc Membrane HDPE –P Application



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Proofex 3000 Application for retaining wall



■ Above ground Waterproofing



Waterproofing-Product range

■ Podium Slab with landscaping

- ▶ Fast setting, Hybrid Polyurea elastomeric waterproof coating

Fosroc Polyurea WH200

f

■ Roof Slab- New construction

- ▶ Modified Pitchfree Polyurtehane system

Nitoproof 600 PF

f

Podium slab with landscape – Requirement



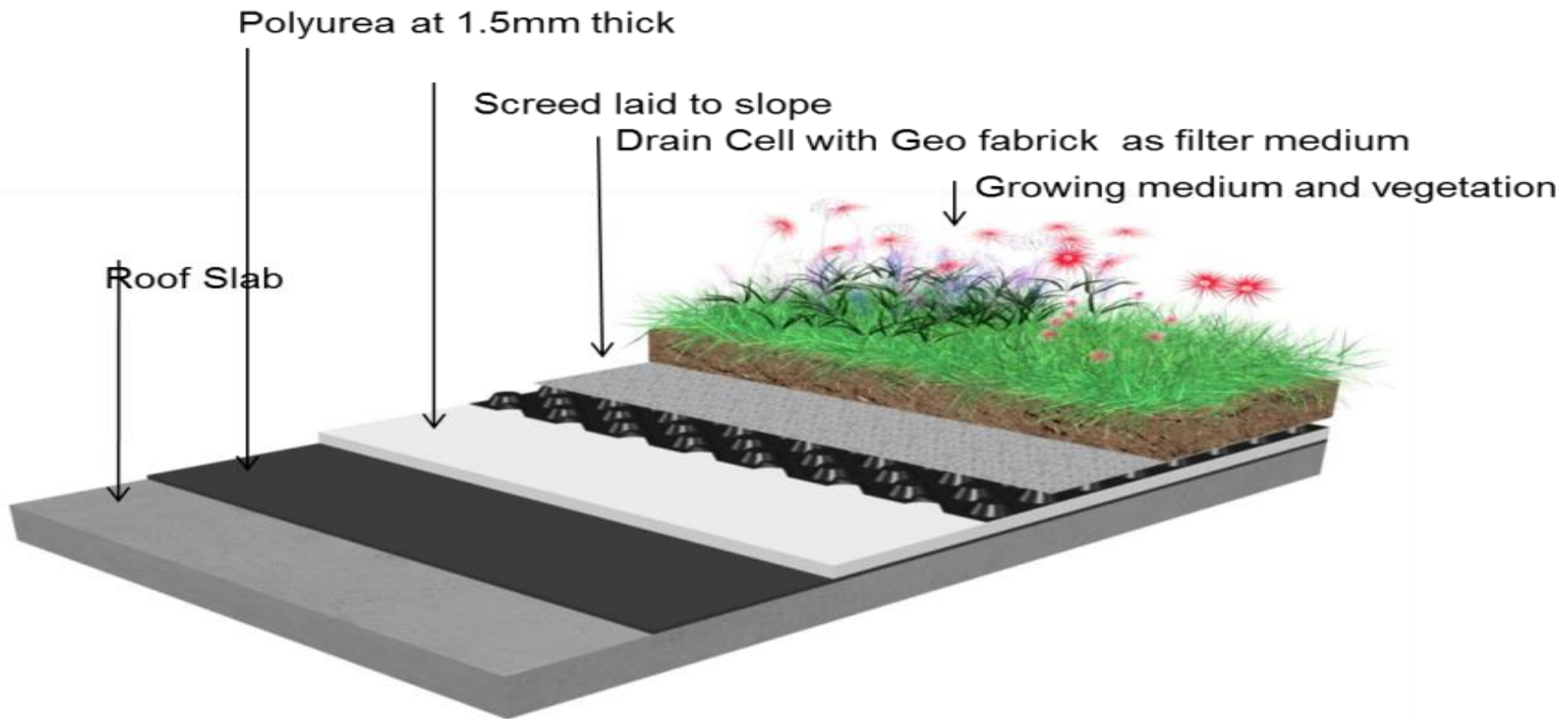
- A high performance polymer coating
- Impervious
- Has outstanding physical properties
- Do not degrade
- Durable & life long



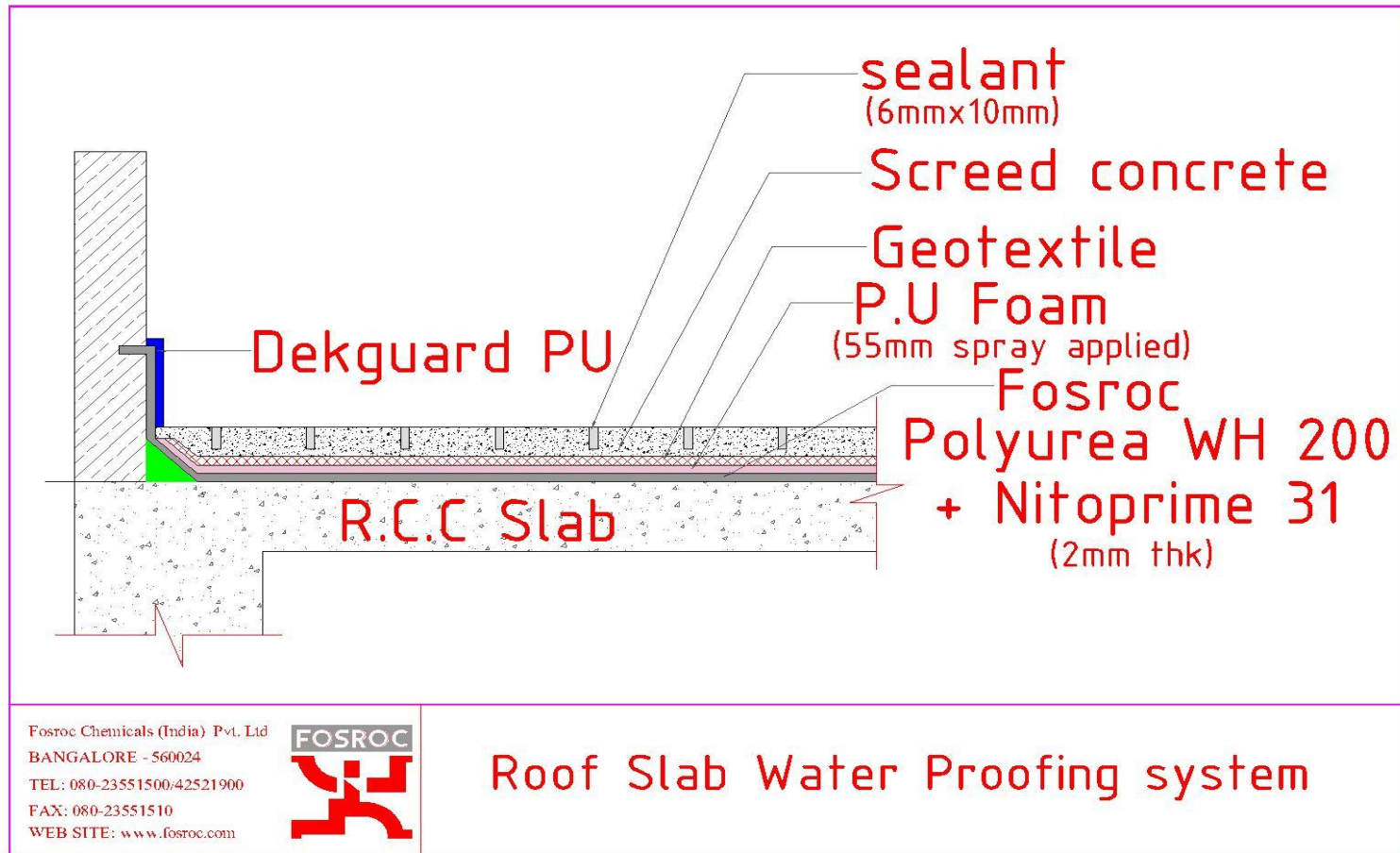
Waterproofing of Podium with landscape

■ Waterproofing system

- ▶ Fast setting, pure Polyurea elastomeric waterproof coating
Fosroc Polyurea WH200



Waterproofing of Podium with landscape





Podium Slab with landscaping
Fast setting, Hybrid Polyurea
elastomeric coating

Polyurea System - Key Features

1

Fast setting
Seamless & fully
bonded system



- Fully bonded – Prevent lateral migration of water
- Seamless : No joints, no worry of joint failure



Polyurea System - Key Features

1

2

Resistant to strong roots



- Root resistance – Protection against damage to the membrane
- Enhanced Service life : System last long >15 years



Polyurea System - Key Features

1

2

3

Spray application



- Faster rate of application – Can easily cover 300 to 500 sqmt/day
- Saves time – Large area can be covered in short span, time saved is money saved
- Over coating time < 20 Seconds – Allow other activity to start quickly
- Trained applicator network



Polyurea System - Key Features

1

2

3

4

Green Product

- Zero VOC - Green product, no damage to the environment
- Credit Rating – Enable to claim green points in case opting for green building certification



Polyurea System - Key Features

1

2

3

4

5

Flexible & Crack
bridging



- Accommodates cracks > 2mm – Minimize chances of product failure & ensure water tightness
- Enhance Durability & sustainability of the structure



Polyurea System - Key Features

1

2

3

4

5

6

Certifications

**Durability test confirming
to Service life of 125 Year
BS EN 13251:2016 and BS
EN 13252:2016**



Properties

Typical Physical properties @ 23°C

Solids by Volume	: 100%
Viscosity	: A ISO 400-800 MPas : B AMINE 400-800 MPas
Density at 25°C, sprayed film	: 1.02 g/ml
Tensile Strength ASTM D412	: 15 MPa \pm 10%
Tear Resistance ASTM D624C	: 50N/mm ²
Elongation ASTM D412	: >450%
Shore A hardens	: 80
Abrasion (1kg, CS10 wheels) ASTM D4060	: 1.3 mg/1000 cycles
Abrasion (1kg, CS17 wheels) DIN EN ISO 5470	: 19mg /1000 cycles
Abrasion (1kg, H22 wheels) ASTM D4060	: 117mg /1 000 cycles
Service temperature range	: -20°C to +80°C *
Resistance to Fire EN13501-1	: Class E, d0
Chemical resistance	: Spillages of mineral and hydraulic oils & fuels : Sea water : Dilute acids & alkalis in soils



Job reference



Brigade Gate Way-Bangalore, India – Podium Slab



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Job reference



References- TCS Chennai



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Job reference



TCS- Elevated platform



www.fosroc.com



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Job reference



Puravankara Project, Bangalore, India – Podium Slab`



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Job reference – Application of Polyurea System



Adani - Water lake project-Ahmedabad, India



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Job reference



Adani - Water lake project, Ahmedabad, India



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Adani - Water lake project, Ahmedabad, India



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Roof Waterproofing



Requirements

Podium slab/Roof waterproofing with Intensive land scape/Hard scape

- Compatible for application on large area
- Resistance to mild roots
- Easy & quick to install
- Accommodate thermal/structural movements
- Crack bridging
- Durable



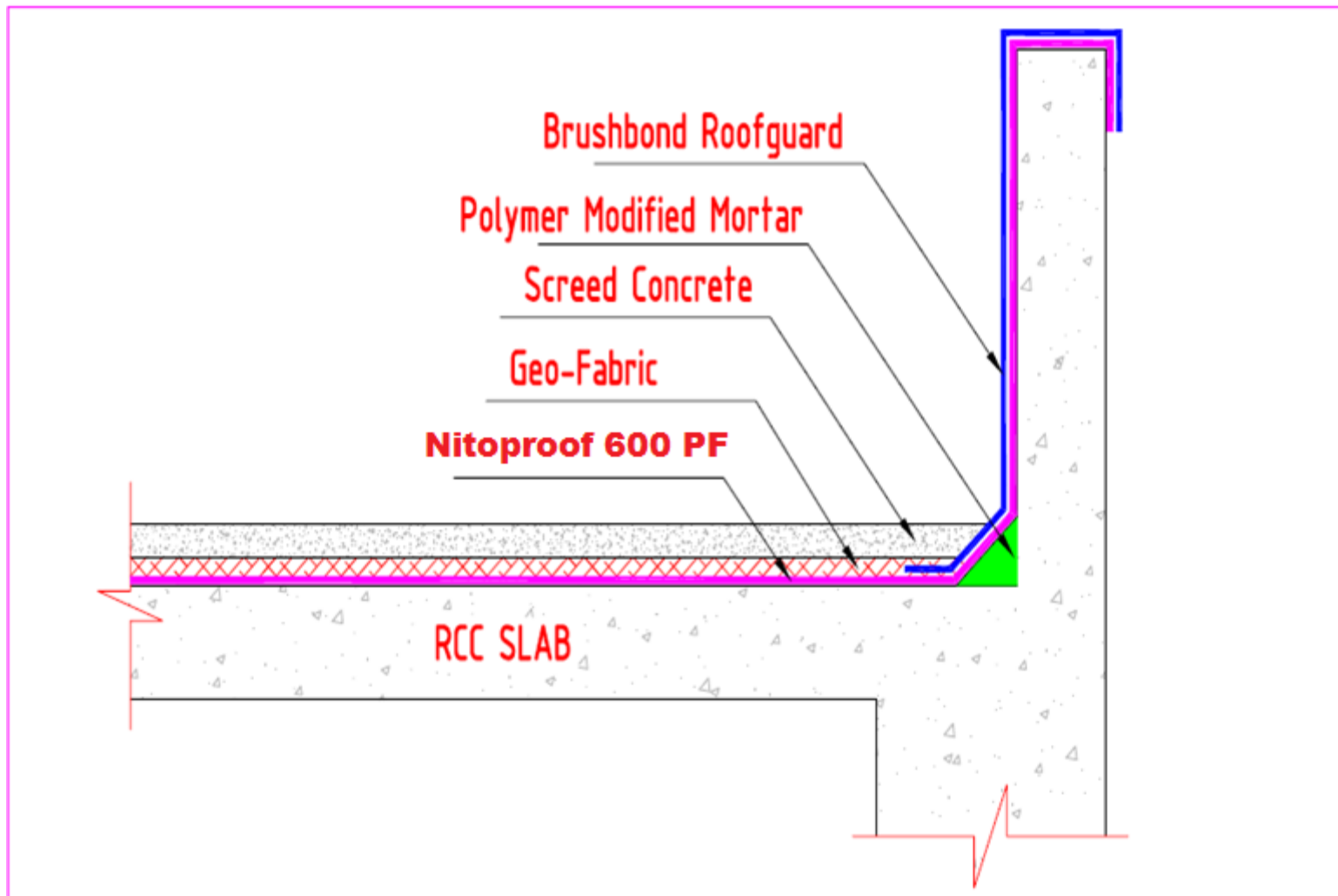
Waterproofing of Roof slab

■ Product

- ▶ Modified pitch free polyurethane system
Nitoproof 600 PF



Waterproofing of Roof slab





Roof Slab Modified pitch free Polyurethane coating

Modified pitch free polyurethane system

Value Proposition

1

Ready to use

- Single Component - No mixing hazels
- Brand names : “**Nitoproof**”



Modified pitch free polyurethane system Value Proposition

1

2

**Fully Bonded &
Seamless**



- Fully bonded – Prevent lateral migration of water
- Seamless : No joints, no worry of joint failure



Modified pitch free polyurethane system Value Proposition

1

2

3

**Resistant to mild
roots**



- Root resistance – Protection against damage to the membrane
- Enhanced Service life : System last long >15 years



Modified pitch free polyurethane system

Value Proposition

1

2

3

4

Spray application

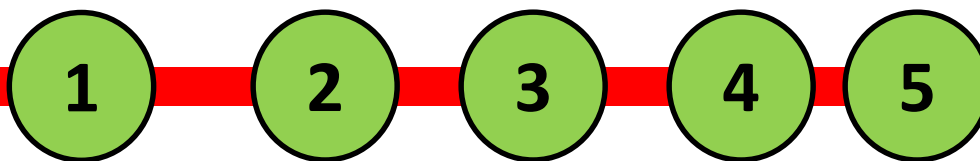


- Faster rate of application – Can easily cover 300 to 500 sqmt/day
- Saves time – Large area can be covered in short span, time saved is money saved
- Over coating time 3 to 4 hours – Allow other activity to start quickly



Modified pitch free polyurethane system

Value Proposition



Pitch free

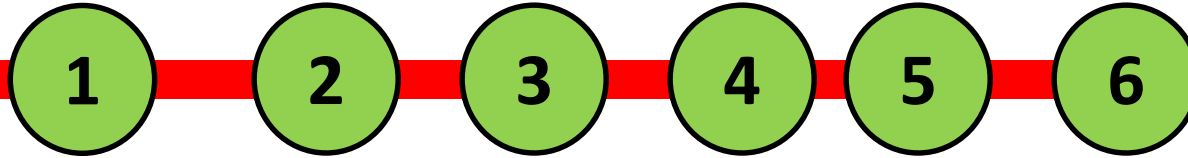


- Zero VOC – Green product, no damage to the environment
- Credit Rating – Enable to claim green points in case opting for green building certification



Modified pitch free polyurethane system

Value Proposition



Crack bridging



- Accommodates cracks > 2mm – Minimize chances of product failure & ensure water tightness
- Enhance Durability & sustainability of the structure



Modified pitch free polyurethane system

Value Proposition

1

2

3

4

5

6

7

Certifications

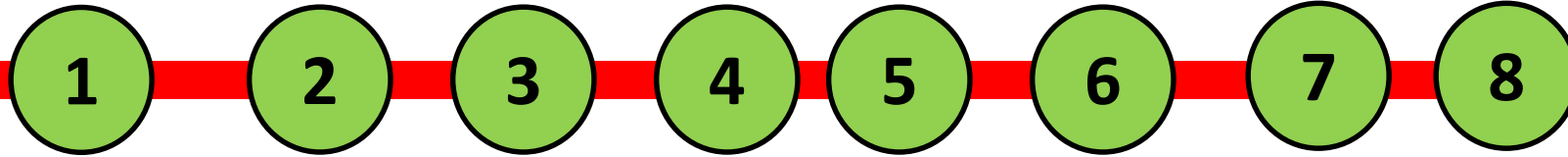
ASTM C836 & 898

TABLE 1 High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane Physical Requirements

Property	Requirement	Test Method
Hardness, min	50	5.5 ^A
Weight loss, max, %	20	5.6 ^A
Nonvolatile, min, %	80	
Low temperature flexibility	no cracking	5.7 ^A
Low temperature crack bridging	no cracking	5.7 ^A
Film thickness (vertical surface), min, mm (mils)	1.52 ± 0.13 (60 ± 5)	5.9 ^{B,A}
Adhesion-in-Peel after water immersion, N/m (lbf/in.)	175 (1)	Test Method C 794
Extensibility after heat aging, min, mm (in.)	6.4 (¼) no cracking	5.12 ^A
Stability, min, months	6	5.13 ^A



Above Ground Waterproofing -One stop waterproofing solution from Fosroc



Package solution



- Nitoproof 600 PF – Intensive landscape/Hardscape/Drive ways
- Polyurea WH200 – Extensive landscape
- Nitocote CM210- Water body
- Expoband One -Expansion joints
- Supercast SW20-Construction joints
- Nitotile Range-Tiling solution
- Nitocote Wall guard-Wall coating
- Nitoseal PU40-Window perimeter gap
- Thioflex 600 – Expansion/Construction Joints in drive way



Major Projects Won



Project	Location	Total Area (SqM)
Hiranandani Solace	Mumbai	6,100
Aurum Ventures	Mumbai	5,000
Prestige courtyard	Chennai	10,000
Casa Grand	Chennai	1300
SPR City	Chennai	3800
MY Home	Hyderabad	3500
Lanco Pharma	Hyderabad	2000
Godrej Golf Link	Delhi	8000
Raheja	Hyderabad	7000
Total		50000





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