Proofex PGP Method Statement

TOOLS & EQUIPMENTS

- Double seam welding machine. Hot air gun.
- Hand Tools (one-arm silicon pressure roller-clippers-cutters) Air pressure testing needle with gauge.
- Air pressure pump.

INSTALLATION PROCESS

A) ***Pile Head Treatment****:*
Reprofile the pile head using "Supercast PC" high strength; cementitious microconcrete after trimming the pile head weak concrete.

Apply "Fosroc Proofex PGP" 2.0mm thick waterproofing membrane onto the reprofiled pile head, dress it properly around the pile & weld the overlap using fusion by hotair gun, the membrane should extend to the reinforcing steel rebars.

Encapsulate the applied Fosroc Proofex PGP membrane with 30mm thick layer of "Supercast EPT" high strength flowable epoxy grout casted within preformed wooden shulter.

B) Horizontal Area of Concrete Raft Foundation:

Base:
Concrete raft dry, clean, smoothly finished, protrusions/ depressions and cracks free (if existing; suitably treated), 100 mm minimum thickness, preferably finished by power float machine.

Separation Layer:
Separation layer of non-woven geotextile fibermat, polypropylene type or similar min. 300 gr/sqm, loose laid with 100mm wide overlaps.

The separation layer will prevent the mechanical abrasion between the Fosroc Proofex PGP membrane and the concrete substructure.

Waterproofing Membrane:
Single ply of PVC-P membrane, 2.0mm thick "Fosroc Proofex PGP". The membrane is laid by fusing adjacent edges with an automatic machine or hot air gun. The rolls end laps are positioned staggered. After the finalinspection of the installation, the horizontal area to be compartmentalized into 200-300m^2 compartments fused by hotair gun to the existing waterproofing membrane and at the construction joints.

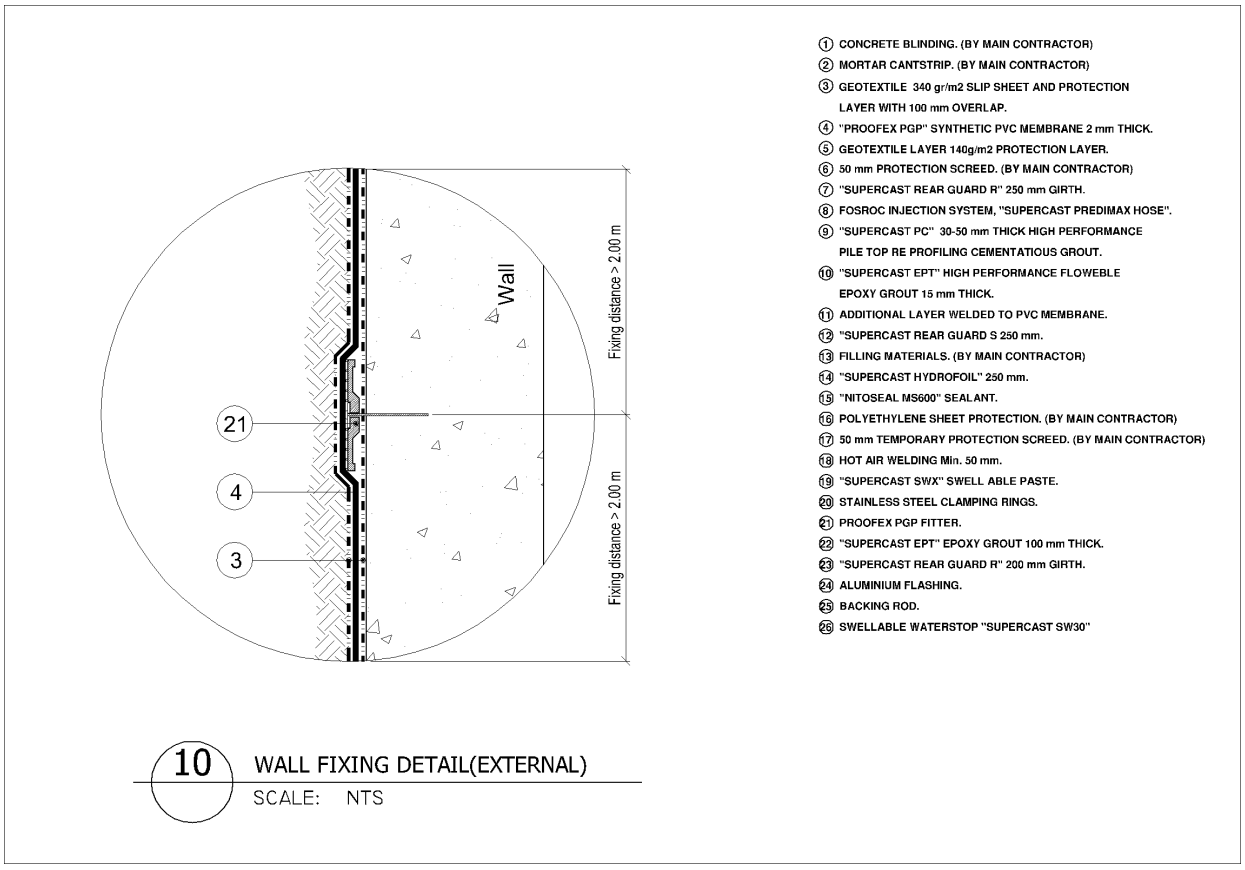
- Automatic fusion can be performed using hot wedge or hot air. The heating element is made up of a hot wedge or hot air blower that forms a double joint that enables the air gap between the two fused lines to be tested using pneumatic air pressure and gauge method.

The fusion temperature is approx. 180°c to 300°c, it is affected by several variables, the automatic fusion machines should be set onsite and a sample fused seam made before starting the installation of the waterproofing system.

Protection Screed / Protection layer
Sand — cement protective screed layer, 50 mm min. thick shall be applied over 1200 gauge polyethylene sheet.

C) Vertical Areas of Walls:
Base :
Wall face shall be dry, clean and smoothly finished, protrusions hollows and cracks free (or suitably repaired).
Separation Layer:
Separation layer of (non-woven polypropylene geotextile fibermat polypropylene type or similar min. 300 gr/sqm , held in place by Fosroc Proofex Fixers PGP and screws, 150 cm center to center.

Waterproofing Membrane:
Apply "Fosroc Proofex PGP" 2.0mm thick membrane. The membrane is laid by fusing adjacent edges with an automatic machine or hotair gun. The vertical membrane is to be held in place by hotair welding to the Fosroc Proofex Fixers PGP which are used to fix the geotextile underlayment. After the final inspection of the installation, the vertical area to be compartmentalized into 200-300m2 compartments using fused by hotair gun to the existing waterproofing membrane starting with the construction joints location & adding more wherever required.



Membrane Upper Termination:
Termination of the upper end of the Fosroc Proofex PGP membrane shall be either horizontally over the caping beam by casting 3cm thick epoxy grout over it or by welding to the waterstop 15cm above the ground floor finish level.

Protection Layer:
Protection layer of (non-woven polypropylene geotextile fibermat polypropylene type or similar min. 300 gr/sqm loosely laid with 100 mm overlap.
In case of using back filling against Fosroc Proofex PGP sheets, double layers of geotextile polypropylene type or similar min. 300 gr/sqm should be applied.

D) Raft Foundation and Structural Walls:
Ensure permanent protection to the installed waterproofing system by casting the basement raft foundation and structural walls.

E) Miscellaneous Waterproofing Details:
Internal/ external corners shall be suitably dressed with the Fosroc Proofex PGP membrane and reinforced with extra strip layer of the same Fosroc Proofex PGP membrane, hot air welded.

F) Re-injectable Hose: (option as per spec)
The "Predimax Injection Hose" re-injectable hose should be prefabricated to suit the actual installation in a particular construction joint.

The " Predimax Injection Hose " hose should be installed just prior to formwork being done for further concrete works. The surface of the concrete where the hose is installed should be flat and smooth. In case surface retarders are used on the concrete joints, the length where the hose is to be installed should be kept free of retarder for a width of 40-50 mm.

The " Predimax Injection Hose " hose if generally installed in lengths of 10 meters and in rare situations or trafficked joints it can be extended by a few meters. This length restriction is governed by the injection efficiency.
Wherever possible, terminate the hoses in a vertical element of the structure or at the edge of the horizontal casting.

There should be approx 20 cms of vent hose projecting out of the concrete/ end boxes

The vent hoses at the two ends of the "Predimax Injection Hose" should be of two different colours. This gives an indication of the end of a hose and the start of the other in the end box.

Prior to formwork being placed, a visual inspection of the hose should be carried out. Any hose found displaced should be fixed firmly and any hose found damaged should be replaced.

" Predimax Injection Hose" should be fixed to the concrete using the clips supplied at a distance not exceeding 20 cms. More clips may be required at turns and verticals. The hose should rest flat and be firm against the substrate so as not to be displaced by concrete being poured.

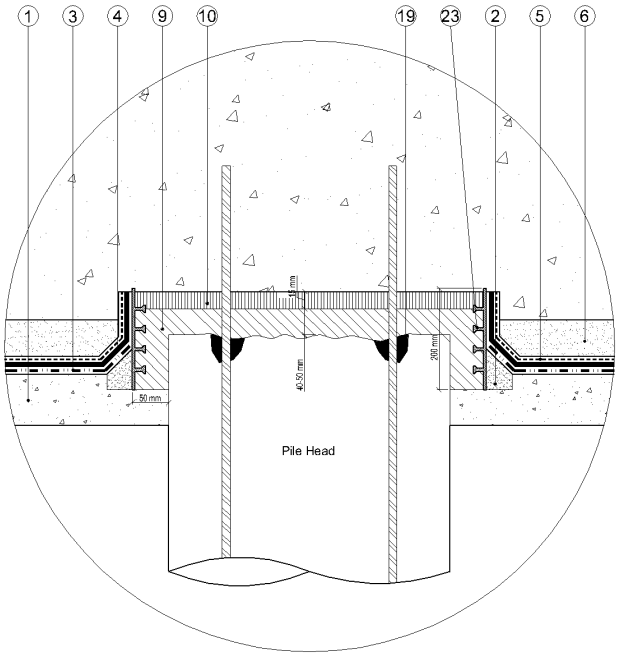
There should be no gaps under the main hose where concrete or slurry might form another joint or displace the hose.

End caps should be installed at the vent ends during fabrication and should not be removed until injection has to be carried out. This will ensure that debris will not enter the hose during construction and the life of the building.

***G) S*wellable water stops (as per spec)**
Provide as per spec at construction joints using Supercast SW 20 as per Fosroc spec

Non Destructive Testing & Repairing For The Substructure
Fosroc Proofex PGP Membrane

Pile top treatment
Prepare the shuttering around the pile for the re-profiling purposes Cut and fabricate a strip of the PVC water stop around the uneven surfaces of the pile to be as part of the shuttering for re-profiling the pile.
Re-profile the uneven surfaces of the pile using the Supercast PC at 25 mm thickness and make sure that the waterstop is integrated in the pile.
Cast the Supercast EPT on top of the pile for minimum thickness of 15 mm
Apply Fosroc Proofex PGP waterproofing membrane onto the re-profiled pile head, dress it properly around the pile & weld the overlap and the waterstop using hot airgun and extend the PVC membrane to be welded with horizontal membrane.



18 PILE HEAD WATERPROOFING DETAIL
SCALE: NTS

1. CONCRETE BLINDING. (BY MAIN CONTRACTOR)
2. MORTAR CANTSTRIP. (BY MAIN CONTRACTOR)
3. GEOTEXTILE 340 gr/m2 SLIP SHEET AND PROTECTION LAYER WITH 100 mm OVERLAP.
4. "PROOFEX PGP" SYNTHETIC PVC MEMBRANE 2 mm THICK.
5. GEOTEXTILE LAYER 140g/m2 PROTECTION LAYER.
6. 50 mm PROTECTION SCREED. (BY MAIN CONTRACTOR)
7. "SUPERCAST REAR GUARD R" 250 mm GIRTH.
8. FOSROC INJECTION SYSTEM, "SUPERCAST PREDIMAX HOSE".
9. "SUPERCAST PC" 30-50 mm THICK HIGH PERFORMANCE PILE TOP RE PROFILING CEMENTATIOUS GROUT.
10. "SUPERCAST EPT" HIGH PERFORMANCE FLOWEBLE EPOXY GROUT 15 mm THICK.
11. ADDITIONAL LAYER WELDED TO PVC MEMBRANE.
12. "SUPERCAST REAR GUARD S 250 mm.
13. FILLING MATERIALS. (BY MAIN CONTRACTOR)
14. "SUPERCAST HYDROFOIL" 250 mm.
15. "NITOSEAL MS600" SEALANT.
16. POLYETHYLENE SHEET PROTECTION. (BY MAIN CONTRACTOR)
17. 50 mm TEMPORARY PROTECTION SCREED. (BY MAIN CONTRACTOR)
18. HOT AIR WELDING Min. 50 mm.
19. "SUPERCAST SWX" SWELL ABLE PASTE.
20. STAINLESS STEEL CLAMPING RINGS.
21. PROOFEX PGP FITTER.
22. "SUPERCAST EPT" EPOXY GROUT 100 mm THICK.
23. "SUPERCAST REAR GUARD R" 200 mm GIRTH.
24. ALUMINIUM FLASHING.
25. BACKING ROD.
26. SWELLABLE WATERSTOP "SUPERCAST SW30"

Method Statement

Non-Destructive Testing Type
Seams and laps shall non-destructively tested using an air pressure test. The purpose of this test is to check the continuity of the seam.

Equipment's &Tools
The equipment used shall consist of a pump capable of producing a minimum 3 bars and a sharp needle with a pressure gauge attached to insert into the air channel.

Test Procedures (Joint made by double fusion automatic machine)
This method ensures an absolutely objective check of the welding seams. With special calipers, seal the ends of the fused seams to be tested. Insert a needle connected to a pressure gauge into the groove between the two fused seams made by automatic machine.
The test should be carried out at an air pressure of 2 bars. Check for a period of 5-10 minutes. The pressure should not fall more than 20% for a successful test. Tests of this nature should be carried out after the fused overlaps have cooled down or if the ambient temperatures are excessive, in the early morning or late evening introduce pressurized air by means of an air pump. Wait 1 minute to ensure the complete expansion of the channel and then start the actual test taking the pressure back to 2 bars.

If the test fails, follow these procedures:
a) While channel is under pressure visually inspect the length of the seam looking/listening for a leak.
b) While the channel is under pressure apply a soapy solution to the seam edge and look for bubbles formed by air escaping.
c) Re-test the seam in smaller increments until the leak is .found.
Once the leak is found using the procedure above, repair the leak with a 150x150mm patch and retest the portions of the seams between the leak areas as described above. Continue this procedure until all sections of the seam pass the pressure test. All non-destructive tests will be noted in Non-Destructive Test/Repair log.(Attached copy of the form)

Mechanical test (Joint made by manual hot air gun)
This is carried out by passing the flat/round tip of a seam probe along the fused seam,exerting an adequate pressure to identify any weak or insufficiently adhered spots. This operation is absolutely necessary to check the integrity of the joint and should be performed when the material is cold. If any gaps or insufficiently fused seams are found, clean and re-fuse as necessary or fuse over the seam with a minimum 150 mm wide strip of the same product.

Repair Procedures
1) Patching ---- used to repair hole, tears, etc.
2) Spot Welding — used to repair small minor, localized flaws.
3) Flap Welding — used to weld the flap of a fusion weld in lieu of a full cap.
4) Capping ---- used to repair failed seams.

The following conditions shall apply to the above methods:
1) All surfaces must be clean and dry at the time of the repair.
2) All seaming equipment used in repairing procedures shall be qualified.
3) All patches and caps shall extend at least 3" beyond the edge of the defect, and all patches must have rounded corners.
4) All cut out holes in liner must have rounded corners, 3" min. radius.

Approval and variations
This method statement is offered by Fosroc as a "standard proposal" for the application of Proofex PGP. 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 for approval, in writing, prior to commencement of any work. Fosroc will not accept responsibility or liability for variations to the above method statement under any other condition