Construction

Method Statement for Application of Sikaplan® WP1100-20HL

Scope: ***Application of PVC Waterproofing Membrane to Basements***

Sika UAE LLC, P.O. Box 213233, Dubai, UAE
Tel: +971 4 439 8200 Fax: +971 4 439 3606 E-mail: sika.uae@ae.sika.com

Construction

1. Scope

This Method Statement Outlines the procedures for the application of PVC waterproofing membrane to the underside of the raft foundations, below ground structure, external walls and lift pits external walls.

This method statement covers only the installation and details of the PVC waterproofing membrane.

All PVC Membrane waterproofing works including pile head treatment, waterbar and Injection hosing system applications (see separate method statements).

2. Installation

2.1 Setting Out

Upon the completion of excavation, pile head removal and trimming of the existing ground levels to final formation levels, the Engineer will approve the formation level before the 1st layer of blinding & waterproofing takes place.

Once the formation has been approved, a concrete blinding mix will be poured. A 100mm setback shall be left from the pile face.

Concrete will have a steel trowel finish and edges/corners shall be rounded to a minimum radius of 50mm.

Any projections in the cementitious substrate will be removed by chiselling and grinding; nails and wires or loose stones should be removed; all the services, holes, voids, etc. will be filled to the level of substrate surface.

Any ponding water will be removed by means of wet/dry vacuum machines and air compressors.

2.2 Work Procedures

2.2.1 Raft/Suspended Slab Horizontal Surfaces

Upon completion of the pile head waterproofing (refer to separate method statement for the pile head) apply a 50mm wide mortar fillet between the blinding layer and outer face of the waterbar.

Geotextile (350g/sq.m)

A cushion layer of geotextile membrane with a minimum unit weight of 350g/sq.m will be laid on top of the blinding concrete which should be free from all projections and loose materials.

The geotextile membrane should be loose laid and overlapped minimum 100mm.

Sikaplan® WP1100-20HL

Once the geotextile membrane has been laid, check the surface of the geotextile membrane for loose debris and sharp projections prior to installation of the **Sikaplan® WP1100-20HL** PVC waterproofing membrane.

Irregular shapes of basement slabs need consideration before the membrane laying direction and sequence is commenced.

Construction

Cut the PVC membrane to the length required allowing for a minimum 80mm membrane overlap.

Unroll and position the PVC membrane allowing sufficient membrane overlap at ends and edges for intersection to vertical waterproofing.

Depending on the location, weld the PVC membrane by at least 30-40mm onto the pile head waterbar leaving 10-15mm of the waterbar exposed from the top edge.

Welding of any joints will be carried out by special Leister welding machines.

Seam overlaps of PVC membranes should in all cases be of minimum 80mm.

The width of the finished welded seam should be at least >30mm for the single seam.

Prior to welding procedure, check to ensure the PVC membrane surfaces are dry, clean, free of dust, loose materials, oil and grease etc.

Prior to any heat welding work, conduct a welding test on a similar PVC membrane specimen.

Inspect and test all PVC membrane joints for soundness.

Waterbars (Horizontal Surfaces)

Surface waterbars shall be **Sika® Waterbar AR-25** heat weldable plasticized PVC, compatible to PVC waterproofing membrane and profiled with ribs on one side.

Shop drawings for the construction joint locations, positioning of the waterbars including compartmentalization waterbars shall be prepared by the Sika recommended specialist applicator and submitted to the consultant for approval.

Cross and T-junctions will be factory welded for assembly on site.

Weld the **Sika Waterbar AR-25** onto the PVC membrane along the line of construction joints and compartments.

Injection flanges will be fixed one to each corner of the compartment.

Geotextile (100g/sq.m)

Following installation of the PVC waterproofing membrane and waterbars, a geotextile membrane with a minimum unit weight of 100g/sq.m will be laid over the top as a protection layer.
Waterbars must remain exposed. A 50 mm thick concrete protection screed must be cast over the top of the 100gr/sq.m geotextile membrane. The maximum aggregate size of the concrete screed should not exceed 10mm.

2.2.2 Raft/suspended slab vertical surfaces & wall construction joints

2.2.2.1 Raft- Shoring wall interface / Vertical installation

Upon completion of the horizontal waterproofing, a 50x50mm sand-cement fillet will be provided at the horizontal-vertical interface on top of the screed.

Construction

A 350g/sq.m geotextile slip membrane will be laid loose on the vertical surface supported from a higher level than the wall kicker by temporary fixing/nailing to the shoring / shotcrete.

Sikaplan® WP1100-20HL will then be placed over the geotextile slip membrane and hung from the shoring wall using temporary fixings.

Ensure that the first line of temporary fixings is above the top level of the wall starter bars by minimum 500 mm.

The vertical PVC membrane will then be welded to the horizontal one. **Sika® Waterbar AR-25** will be provided along the wall kicker and also connected to the horizontal raft waterbar to form a closed loop.

All waterbars should be thoroughly heat welded to the horizontal and vertical PVC membranes. Inspect all welds for continuation. No voids, pinholes etc will be allowed.

Upon completion of the welding and testing of membranes, a protection layer of geotextile membrane 350g/sq.m will be placed prior to rebar fixing.

Once the concrete is cast, the temporary fixing on the shoring wall will be removed and the next sheet of PVC membrane will be welded so as to overlap the punctured membrane by at least 80 mm.

The **SikaFuko VT1 System** will then be installed along the centre of the wall kicker with the hoses extending to the inner face of the wall shutter.

In order to fix the PVC membrane on the vertical surface of the structure, fixing discs (roundel) with spikes will be welded to the vertical membrane at 2.00 m centres vertically and horizontally. The spikes shall face inwards and be adequately secured to be cast into the concrete wall.

Sika® Waterbars and the **SikaFuko VT1 System** will be provided along all the construction joints throughout the height of walls that are below ground level. Terminations shall be at least 1.00 m above highest ground water level.

2.2.2.2 Membrane termination

The Sika PVC Waterproofing membrane should be terminated minimum 1.00 m above maximum ground water level and minimum 0.15 m above ground level.

3. Welding methods

Sikaplan waterproofing membranes can be welded using heat welding machines

- Seam overlaps of membranes should in all cases be minimum 80mm
- The width of the finished welded seam should be at least > 30mm
- Prior to welding procedure, membrane surfaces should be dry, clean, free of dust, oil and grease etc.
- Prior to any heat welding work conduct a welding test with membrane specimen (mandatory in order to adjust welding temperature and speed of the machine)

Construction

Recommended machines and tools

Heat welding

- For continuous welding quality, it is recommended to run welding equipment connected with its own circuit, or using its own generating set.
- Welding machine operators should be trained and experienced in heat welding technology according to local regulations and to operate electrical devices in wet, or humid conditions
- Automatic welding machine: 220V, hand held welding gun: 220V, resp. 110V according to regulations

Manual welding

- Hand held welding gun type Leister Triac S, or type Leister Triac PID, 220 V, resp. 110V (adjustable temperature)
- Hot air nozzles 40mm and 20mm, or 30mm all purpose-nozzle
- Hand held pressure (Silicone) roller with ball bearing (available from Leister), width 20mm and 40mm
- Reserve heating element

Semi-automatic welding for horizontal and vertical area waterproofing

- Hand held semi-automatic, self-propelled welding machine, type Leister Triac Drive, 220V, resp. 110V (adjustable temperature and speed)

Automatic welding for horizontal and vertical area waterproofing

- Automatic, self-propelled, type Leister Twinny S, or Leister Twinny T (adjustable temperature speed and pressure), 220/380V

Waterbars welding equipment

- Electrical heating sword, or manual welding hot air gun (Leister).





Hani Fikri
Market Field Manager - Waterproofing – IMEA

Rodney Van Eck
Market Development and Technical Services Manager

Sika UAE L.L.C. P.O. Box 213233, Dubai, U.A.E.
Phone: +971 4 4398200/ Fax: +971 4 4393606/ E-mail: sika.uae@ae.sika.com