METHOD STATEMENT
FOR PEEL & STICK MEMBRANES
SikaProof® P

13.11.2020 / V05.3 / SIKA UK / ALEX BURMAN

BUILDING TRUST

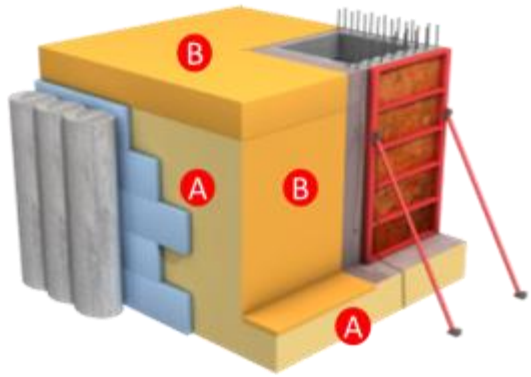
TABLE OF CONTENTS

1 SCOPE

This Method Statement describes the components, build-up and installation procedure of the self-adhesive, peel & stick, SikaProof® P membrane waterproofing system.

2 SYSTEM DESCRIPTION

SikaProof® A & P are fully and permanently bonded, flexible sheet membrane systems designed to provide waterproof basements and other below ground structure.



A) **The pre-applied SikaProof® A** system is installed on the concrete blinding below base slabs and on single-faced formwork for walls, before the reinforcement is fixed and the concrete is poured directly onto the membrane, creating a full mechanical bond with the hardened concrete structure.

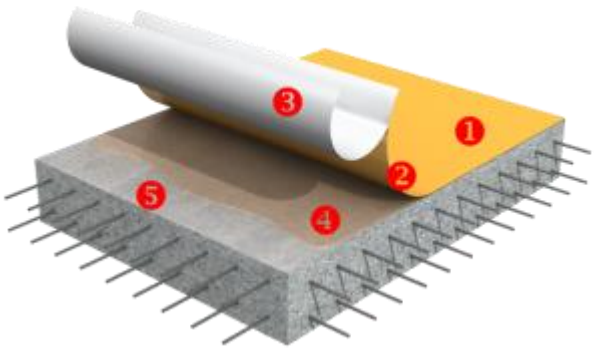
B) **The post-applied SikaProof® P** system is installed onto existing hardened concrete structures, such as horizontal edges, decks and on walls with double-faced formwork.

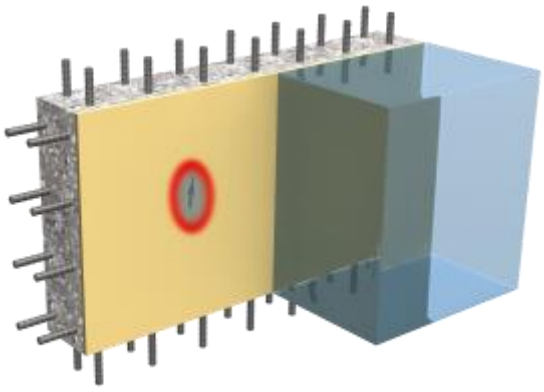
SikaProof® P-12 is a self-adhesive, flexible sheet membrane waterproofing system. It consists of a **flexible polyolefin (FPO) membrane (1),** laminated with a **unique Sika sealant and adhesive (PO) (2)** that is protected by a polyethylene (PE), peel and **release liner (3)**.

The SikaProof® P system is a cold- and post-applied waterproofing system that is designed for installation on **existing hardened concrete structures (5),** where it is fully and permanently bonded.

The bond is created and enhanced by the application of **SikaProof® Primer-01 (4)** onto the prepared concrete surfaces to seal and condition the surface prior to the peel and stick SikaProof® P membrane sheets being installed.

To seal and bond the membrane joints and detail connections in the SikaProof® P system, special SikaProof® adhesive tapes are used, no open-flame or heat welding is required.





USES

Damp-proofing, waterproofing and concrete protection for basements and other below ground concrete structures against ground water ingress:

- On horizontal slabs, decks and podiums
- On vertical walls
- For extensions and reconstruction works
- For precast concrete structures

CHARACTERISTICS/ ADVANTAGES

- Cold-applied and self-adhered (no heat or open flames required)
- Fully and permanently bonded to the reinforced concrete of the structure
- No lateral water underflow or migration between the concrete structure and the membrane system
- High watertightness tested according to different standards
- Easy to install with fully adhered joints (no welding required)
- Temporary weathering and UV-resistant during construction
- Resistant to ageing
- High flexibility and crack-bridging abilities
- Resistant to aggressive mediums in natural ground water and soil
- Can be combined with other approved Sika waterproofing systems including:
  - SikaProof® A and Sikaplan® WT waterproofing membranes (FPO-based)
  - Sikadur Combiflex SG system, joint sealing system (FPO-based)

2.1 REFERENCES

Europe

- Product Declaration EN 13967:2012 – Flexible sheets for waterproofing (type A&T), CE Certificate No. 1349-CPD-065
- German function tests for system – Test lab Wissbau Beratende Ing.-GmbH, Essen Germany, Report No. 2013-253

North America

- Function test according ASTM D 5385 modified (Resistance to lateral water underflow), internal MPL

2.2 LIMITATIONS

Limitations for suitable applications and use of the system are described in the **Product Data Sheet (PDS) of SikaProof® P-12 and SikaProof® Primer-01** respectively. Please ensure that you have the current local PDS and refer regarding relevant limitations in relation to:

- Recommended applications
- Maximum head of water
- Substrate nature and quality
- Substrate preparation, surface temperature and moisture
- Maximum exposure time before protection
- UV light, weathering and chemical resistance

The **SikaProof® P** membrane system has to be protected shortly after installation, especially before any backfilling, in order to protect the system from mechanical damage and environmental influences (UV and mainly heat etc.).

Country / Climate	Maximal exposure time of the membrane after installation
Northern & Central Europe including France, Italy (except South), Japan, Korea, Mongolia, New Zealand, Canada, USA northern states,	90 days
Southern Europe including Spain, Southern Italy, Greece, Turkey, Northern Asia, Latin America	30 days
Near & Middle East, India, South Asia & Pasific, Australia, USA southern states, Central America	3 day for temperature above 35°C, 5 days for temperature below 35°C

3 PRODUCTS & SYSTEM

3.1 SYSTEM COMPONENTS

The **SikaProof® P-12** system consists of the following components required to create the watertight system:

a) **SikaProof® P-12** membrane
b) **Detailing tapes** and
c) **Sealants** for sealing and bonding the joints, connections and details
d) **SikaProof® Primer-01**

A) SikaProof® P-12 membrane
Supplied in 1.0 width rolls with a prefabricated overlap with adhesive on one side, including installation marks on the back, for an easier positioning.

	SikaProof® P-12 (482389)
Membrane thickness [mm]	0.60
Total sheet thickness [mm]	1.20
Roll length [m]	20.0
Roll width [m]	1.00
Roll weight [kg]	22.0 kg
Packaging-units	Single rolls

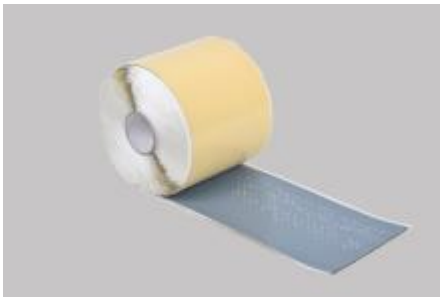
Overlap edge with overlapping edge with adhesive and installation marks for easier, faster and more secure installation.

B) Detailing tapes

SikaProof® ExTape-150 (424705)

Butyl rubber based, self-adhesive tape, 150 mm wide, for external jointing on the yellow membrane.
Separate HC version is specially designed for use in hot climate.

SikaProof® Patch-200 B (457589)
Butyl rubber based, self-adhesive tape, 200 mm wide, for external
post-installation sealing of joints, penetrations or damage to the membrane.



SikaProof® FixTape-50 (424701)
Butyl rubber based, double sided-adhesive tape strip, 50 mm wide, for sealing many different details.

	SikaProof® ExTape-150 (424705)	SikaProof® Patch-200 B (457589)	SikaProof® FixTape-50 (424701)
Tape thickness [mm]	1.10	2.20	1.50
Roll length [m]	20.0	20.0	20.0
Roll width [mm]	150	200	50
Roll weight [kg]	4.80	12.2	2.00

Packaging-units per box	4 rolls (80m)	1 roll (20m)	5 rolls (100m)

C) Sealants

The sealant is an important component to seal the cut-outs for details and the T-joints at transverse or detailing overlap joints. The following products are suitable and recommended:

- **Sikaflex®-11 FC**
- **Sikaflex® PRO-3**

	Sikaflex®-11 FC (410175, grey)	**Sikaflex® PRO-3 (422907, grey)**
Packaging sizes	300 ml cartridge	600 ml cartridge
Packaging-units per box	12 x 300ml	20 x 600ml

D) SikaProof® Primer-01

Synthetic rubber based primer, solvent-dispersed, required for enhancing and ensuring optimum bond to the suitably cleaned and prepared concrete surfaces.

	SikaProof® Primer-01, 5 kg (491035)	**SikaProof® Primer-01, 12.5 kg (491156)**
Quantity per unit [kg]	5.00	12.5
Colour	orange	
Packaging-units	Single metal pail	

3.2 STORAGE CONDITIONS / SHELF LIFE

All SikaProof® components have a defined maximum shelf life (see chart below) from their date of production, provided they are stored properly in unopened, undamaged original packaging, in a horizontal position, in dry conditions and at temperatures between +5°C and +30°C. They must also be protected from direct sunlight, rain, snow and ice etc. Do not stack pallets of the membrane rolls on top of each other, or under pallets of any other materials during transport or storage.

	SikaProof® P-12 membrane	SikaProof® ExTape-150	SikaProof® Patch-200 B	SikaProof® FixTape-50	Sikaflex®-11 FC / PRO-3	SikaProof® Primer-01
Shelf Life	12 months	24 months	24 months	24 months	15 months	12 months

3.3 SYSTEM BUILD-UP

The **SikaProof® P** system is a cold- / post-applied and self-adhered waterproofing system that is designed to be fully bonded to existing hardened reinforced concrete structures. Therefore the correct substrate preparation of the concrete surface is essential to create a full and durable, optimized bond, to prevent any water migration or lateral water underflow between the concrete structure and the waterproofing membrane system.

3.4 CONCRETE QUALITY

The concrete quality is also key factor for successful waterproofing, in order to enable a full and permanently sealed and bonded solution, without any lateral water underflow or migration between the **SikaProof® P** membrane and the concrete structure.

The concrete and especially the surface layer primarily determined by the binder matrix, is the key factor for a full and permanent bond. The following concrete requirements should therefore be fulfilled:

- Hardened and of sufficient compressive strength, minimum 25 N/mm^2
- Minimal pull-off strength, 1.5 N/ mm^2
- Dry, sound, clean, free of any contaminants that could prevent or reduce adhesion (such as release agents) and loose or friable particles
- Even, level and free from surface defects (e.g. blowholes, voids, honeycombing, cracks, protrusions, etc.)

These requirements are predominantly influenced by:

- The **concrete structure** to be waterproofed has to be sufficiently reinforced to be stable (recommended minimum thickness for new watertight structures is 200 mm)
- **Concrete mix designs** vary from region to region, according to the available raw materials and the local environment in particular. Therefore we recommend defining a standard concrete mix design locally, according to the relevant local regulations and available material resources. This must obviously be tested to confirm that the defined concrete mix will create a fully bonded system together with SikaProof® P.
- The **concreting workmanship** is also key: well placed, compacted/vibrated and cured concrete is essential for a watertight concrete structure.
  On horizontal areas the surface finishing is particularly important, therefore it is recommended to correctly smoothen the concrete surface with suitable trowelling and finishing techniques.

For more information regarding the concrete substrate requirements please refer to Section 6.2 Substrate preparation, in this Method Statement.

4 PROJECT DESIGN

The successful waterproofing of basements requires detailed planning and this should be considered in the early stages of the design process.

Firstly, the project's specific location, function, exposure and any other requirements must be fully defined in order to select the most appropriate Sika waterproofing solution, such as the SikaProof® membrane system.

This includes consideration and assessment of all of the following aspects:

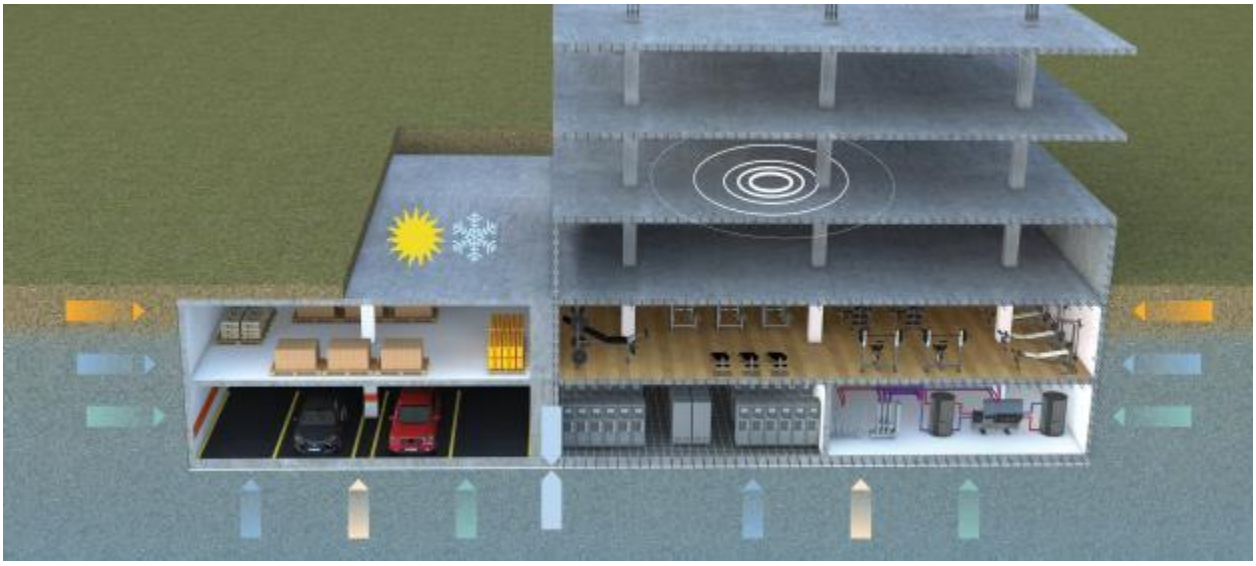
- Type of excavation and substrates
- Construction method
- Maximum water pressures
- Type and degree of any chemical attack
- Climate and environment during construction and in service
- Minimum thickness of the structure
- Level of any anticipated settlement
- Concrete type and consistency
- Construction programme and scheduling for efficient installation of the waterproofing system
- Any other construction related aspect or details that could influence the functionality of the SikaProof® system, such as excavation dewatering systems, or potential damage / loading on the membrane etc.

4.1 SELECTION OF THE SIKAPROOF® MEMBRANE SYSTEM

It is not only the water pressure that is relevant for selection of the most appropriate SikaProof® membrane system.

The different levels of exposure and the requirements of the construction process are also important in defining the correct SikaProof® membrane system for the specific project and application. These include:

- Level and nature of the ground water: Damp soil, percolating water or water under hydrostatic pressure
- Ground conditions: Aggressive mediums (such as sea / salt water, radon / methane gas etc.), type of soil, ground water temperature, seismic exposure to earthquakes etc.
- Static and other load: Static load, uplifting force, settlement, dynamic forces etc.
- Degree of watertightness required, whether minimal seepage can be tolerated, or if absolutely no water penetration, or even no water vapour penetration is permissible.
- Level of durability and service life required.



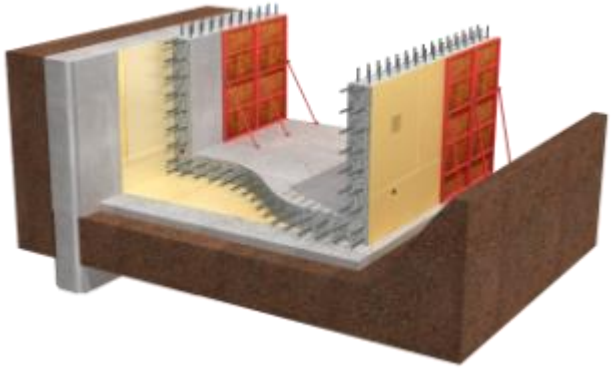
The table below can be used as a general selection guide for some typical applications. There are many specific criteria and project requirements that can influence the selection of the appropriate post-applied waterproofing solution such as SikaProof® P-12 membrane. This list is not exhaustive.

General selection guide:

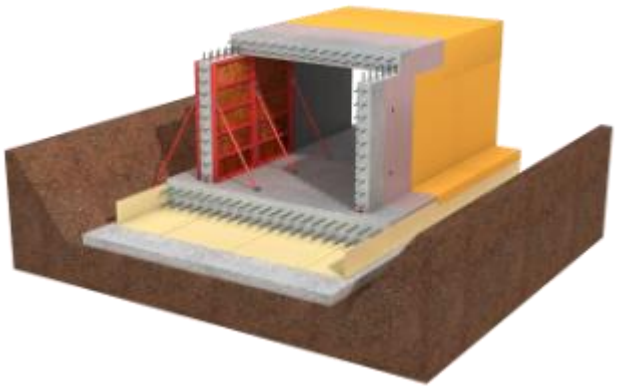
Selection criteria	**Sika Bituseal S-115**	**SikaProof® P-12**	**SikaProof® A-08/-12**
Technology	Bituminous SDS thin film	FPO membrane with PO based sealant adhesives	
Typical uses	Damp proofing / limited waterproofing / concrete protection of structures and basements	Waterproofing for civil engineering structures, concrete protection of basements constructions	Waterproofing for civil engineering structures of basement constructions
Typical applications	▪ Single structures, individual and strip foundations ▪ Walls in open cut excavations	▪ Overstand of base slabs ▪ Walls in open cut excavations ▪ Decks, podiums	▪ Base slabs, rafts ▪ Walls in vertical or open cut excavation
System limitation (water pressure)	≤ 5 m (≤ 0.5 bar)	≤ 10 m (≤ 1.0 bar)	SPA-08: ≤ 10 m (≤ 1.0 bar) SPA-12: ≤ 15 m (≤ 1.5 bar)
Crack-bridging	Not tested	≤ 1.0 mm	SPA-08: ≤ 1.0 mm SPA-12: ≤ 3.0 mm

Vertical excavation, e.g. piled walls

Open-cut, sloped excavation



SikaProof® A could be used for below base slabs and walls in vertical or sloped excavations.



SikaProof® P could be used for walls in open-cut excavation and for horizontal decks.

4.2 REQUIREMENTS FOR POST-APPLIED SYSTEMS

The following details have to be considered in the early stages of the project. Especially the requirement for any detailing solutions that have to be installed before the concrete is placed. The correct application of these detailing solutions is also important for the successful completion and watertightness of below ground structures.

Additional joint sealing systems (pre-installed)

Any designed joints or connections in or to the structure must be sealed using the complementary Sika® Engineered Joint Waterproofing Solutions, dependent on the project and structural requirements.

Water could easily enter a structure through all types of joints, connections, voids, cracks or honeycombing etc., wherever the membrane is not fully bonded to the surface of the reinforced concrete. Therefore all of the joints, connections and voids must be sealed with one or more of the following system solutions :

- **SikaSwell® A Profiles** / **SikaSwell® Rings** and / or **SikaSwell® S-2** Adhesive Sealant (see picture)
- **Sika® Waterbars / Waterstops**
- **SikaFuko® VT** injection hoses

Connections to the SikaProof® A, pre-applied system

For the optimal connection between the post-applied system SikaProof® P and the pre-applied systems SikaProof® A the following detailing solutions are recommended:

Note: The specification and the installation of these details must be considered early in the design and project planning phase, at the minimum before installation on site of the pre-applied SikaProof®A system.

Connection at base slab overstand (toe)

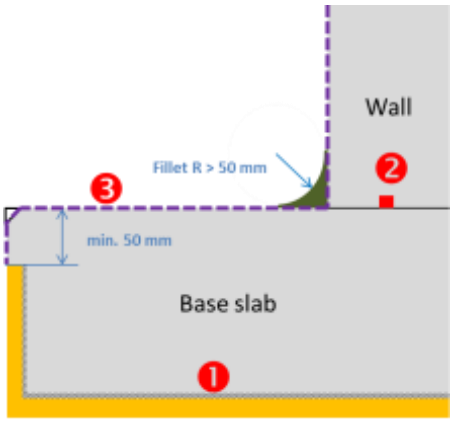
Check and confirm the following:

- The SikaProof A membrane should be terminated vertically minimum 50mm below the edge
- The concrete edge should be chamferd
- A mortar fillet should be formed in the angleed, minimal 50 mm
- If SikaProof A is also used for the walls, then it should be set off from the bottom, to minimum of the fillet height.
- Additional joint sealing is mandatory, minimum with SikaSwell.
- The horizontal surface has to be smooth and even according to the min. defined substrate requirements. To avoid time consuming preparation and treatment, these surfaces and edges can be finished during the concreting works, e.g. by trowlling.
- T-joints between the SikaProof A and / or SikaProof P have to be sealed with a patch of SikaProof ExTape-150.

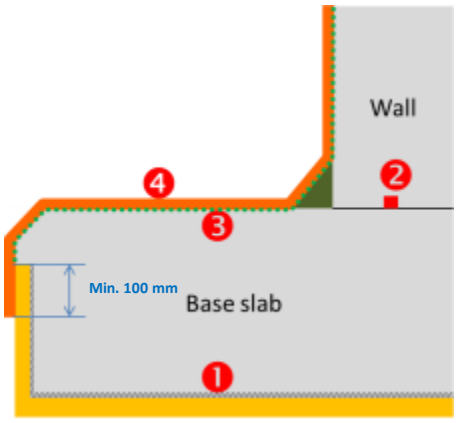
Legend for graphs below:

1) SikaProof A membrane
2) SikaSwell A with SikaSwell S-2
3) Surface preparation & SikaProof Primer-01
4) SikaProof P membrane

State installation of SikaProof A:



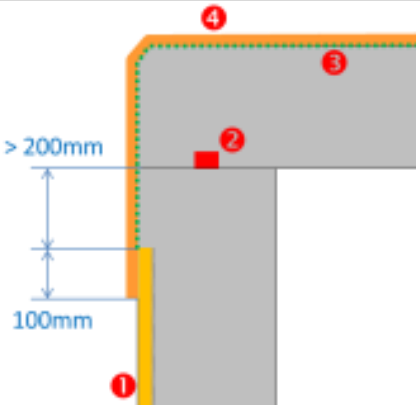
State installation of SikaProof P:



Connection to deck, podium and wall

Check and confirm the following:

- The edge should be chamferd.
- If SikaProof A is used for the walls make sure that is terminated at least 200mm bleow the top of the wall.
- The membrane sheet overlaps and the construction joint from the wall to deck slab should be staggered, by minimum 200mm.
- Additional joint sealing is mandatory, minimum with SikaSwell.



1. SikaProof A
2. SikaSwell A Profile
3. SikaPRoof Primer-01
4. SikaPRoof P-12

5 ENVIRONMENT, HEALTH & SAFETY

5.1 PERSONAL PROTECTION EQUIPMENT (PPE)

For the installation of **SikaProof® membrane** system there is no special PPE (personal protection equipment) or safety equipment required. Any specific local regulations and/or requirements must be fully complied with.

SikaProof® Primer-01 should be transported, stored and applied according to the appropriate local regulations and / or requirements. For more detailed information please refer to the current Product Data Sheet and Material Safety Data Sheet for **SikaProof® Primer-01**. Comply with the warning labels on SikaProof® Primer-01.

In addition to the generally recommended safety instructions and equipment for works on construction sites, the following personal protective equipment (PPE) is essential for anyone working with solvent-dispersed primers or resin based chemical products, because handling or working with this type of materials can cause irritation to the eyes, skin, nose and throat.

- Appropriate eye protection should be worn at all times while handling and mixing such products.
- Safety shoes, gloves and other appropriate skin protection, such as long-sleeved shirts (or barrier cream on the skin) must be worn at all times.
- Ensure sufficient ventilation during application in closed or confined spaces. Additionally a respiration breathing mask may be required or helpful in these situations.

- Despite taking all safety precautions, if there are any instances of skin contact, then rinse immediately with clean warm water and use soap and water to thoroughly clean the skin.

Always wash hands and exposed skin with suitable soap and water after handling chemical products and before food consumption.
In the event of any spillage or contact with the eyes, always seek medical advice immediately after rinsing and cleaning the eyes with a professional eyewash kit or at the minimum with clean water. Safety glasses or other eye protection obviously reduce the risk but they can also create a false sense of security.

5.2 WASTE DISPOSAL

The generation of waste should be avoided or minimized wherever possible. For further information about specific products, please refer to the respective current Material Safety Data Sheet.
Any waste from **SikaProof® membrane** sheets and the ancillary tapes produced from synthetic polymers, plus the packaging material (cardboard and liners) can all be recycled and/or disposed of in accordance with local regulations.
Empty containers of **SikaProof® Primer-01** may retain some product residues. This material and its container must be disposed of in a safe way. Disposal of this product and any by-products should at all times comply with the requirements of local environmental protection and waste disposal legislation and any relevant local authority requirements. Avoid dispersal of spilled material and run-off including contact with soil, waterways, drains and sewers.

5.3 CLEANING OF TOOLS

Tools and equipment must be cleaned with suitable cleaner immediately after use.

6 APPLICATION & INSTALLATION

SikaProof® P is a cold- and post-applied, self-adhesive, sheet waterproofing membrane system that is installed onto existing / hardened concrete structures. The installation method for SikaProof® P and other self-adhesive / self-adhered sheet waterproofing membranes, such as Sika Bituseal S-115, is by peel & stick, as the state of the art, for simple and easy bonding of the membrane on to the concrete surface, including the overlapping membrane joints.

The membrane overlap joints and all other membrane detailing connections are bonded and sealed using either the self-adhesive membranes themselves and simple overlapping, and / or by using the ancillary SikaProof® adhesive tapes and Sika® sealants. Complex and time consuming membrane welding is not required.

For further information please refer to the respective current Product Data Sheet and Application Manual.

1) Substrate preparation	2) Substrate priming	3) Installation of membrane sheets	4) Protection and backfilling

6.0 SUBSTRATE REQUIREMENTS

The substrate must fulfill certain requirements before applying the SikaProof® Primer-01 and then adhering the SikaProof® P membrane, including:

A) Hardened and of sufficient compressive strength, minimum 25 N/mm^2, and minimal pull off strength, 1.5 N/mm^2

B) Moisture content of ≤ 5 % (by weight) and minimum surface temperature +5 °C

Includes the dew point: Surface temperature has to be ≥ 3°C above the dew point

C) Sound, even, level and without surface defects (such as blowholes, voids, honeycombing, cracks, protrusions, etc.).

D) Clean, free of any contaminants that could prevent or reduce adhesion (such as release agents, oil, greases, fuel etc.) and free of any loose or friable particles, dust and dirt etc.

If these requirements are not fulfilled, than other appropriate preparatory measures have to be taken – Please refer to Section 6.1 of this Method Satement ‘Substrate Preparation’.

A) Concrete strength

This characteristic will define adequate concrete quality and hardness.

- **Compressive strength**, minimum 25 N/mm^2
- **Pull off strength**, minimum 1.5 N/mm^2

Both should be tested if in any doubt e.g. in a defined test area with suitable equipment such as a pull-off tester (see picture) and a rebound test hammer.

B) Moisture content

The moisture content of the concrete is a key factor for the application of a permanently adhered system.

- **Moisture content** ≤ 5 % by weight

Note: It is also important to take any potential **rising moisture** and the **dew point** conditions into consideration. Therefore the:

- Surface temperature has to be ≥ 3°C than the dew point. (See the Dew point chart in the attachment)

If the moisture content and conditions are outside of these prescribed limits, then appropriate measures must be taken, e.g. further drying or application of a moisture barrier.

The moisture content can be tested e.g. with a Tramex moisture meter (see picture), or by CM-measurement (or according to ASTM D 4263 with a plastic film laid on the surface) etc.

To check the dew point the surface and air temperatures and as well the relative hummidity has to be measured (see picture).

C) Surface smoothness

The surface must be sound, even, level,

- without any protrusions (such as cement laitance, fins, burrs etc.)
- without voids (such as blowholes, honeycombs etc.)
- and without any other surface defects (such as cracks etc.),

Two surface characteristics are important to check and confirm:

a) Evenness

- For correct application straight level changes must be avoided, which means: On a 2m length no more than 10mm offset.
- On horizontal areas there should be no high or low points , other than as part of the drainage system (only for percolating water). Therefore a minimum slope of ≥ 2% is required to prevent any ponding / standing water.

6.1 SUBSTRATE PREPARATION

Generally the main substrate for SikaProof P membranes is concrete, but for some special applications and details other substrates are possible. Refer to the chart below for information on these and the pre-treatment / priming required.

SikaProof® P onto	Concrete	Brickwork	SikaProof membrane overlaps	Any other
Treatment	Mechanically prepare and repair any surface defects	Mechanically prepare and repair any surface defects	Cleaning with Sarnafil T Clean and then wiping with T Prep	Please contact Sika Technical Services
Priming	SikaProof Primer-01		Not required	

When the concrete substrate requirements are not fulfilled, the following is a description of the necessary preparation and pre-treatment:

Mechanical preparation

Remove any weak concrete, high spots/protrusions, cement laitance, existing coatings and achieve a fine-gripping profile that is clean, dry and free from dirt, grease, oil and any other form of surface contamination.

- **Horizontal areas** usually have to be mechanically prepared if not appropriately finished after the concrete is placed.
- **Vertical areas** normally require at least some limited mechanical preparation, especially if the formwork was very smooth, there are fins, or grout loss, and/or any other concrete surface defects.
- If **release agents** used the contaminated upper cement laitance must be removed

Edges and corners

All straight edges and corners must be chamfered to prevent any damage to the membrane and to make installation easier.

Recommendation:

- Smoothen sharp edges slightly approx. 5mm with a grinder

How to treat the concrete surface mechanically:

For light treatment use a chipping hammer or hand grinder with a diamond disc and a vacuum to remove the dust. Especially use for:

- Smaller areas
- Edges and corners
- Oversized slabs, high spots/protrusions

For larger areas and areas requiring more surface preparation:

Concrete scabbling

Shot or sand blastcleaning

Grinding

Surface cleaning

Before any repair works or further treatment and installation of the SikaProof® P membrane system, any dirt, dust, loose and friable materials must be completely removed from all surfaces, preferably by vacuum.

Surface repair work

Any surface voids, honeycombing, cracks or blowholes must be repaired, filled or levelled using appropriate concrete repair products, such as from the Sikafloor®, SikaDur® and Sika MonoTop® ranges. The best method of preparation and the repair product will depend on the surface condition, environmental constraints and the specific requirements.

Before any repair works any dirt, dust, loose and friable material must be completely removed from all surfaces, preferably by vacuum.

Edges and corners

All inside edges and corners have to be chamfered for easier installation.

Recommendation:

- A corner fillet should be of minimum radius 50mm, and we recommended in a triangular shape.

Levelling

Any concrete, mortar or screed may have to be levelled (e.g. leveling mortar or scratch coat) and then primed (e.g. with SikaProof Primer-01) in order to achieve the required substrate conditions (e.g. strength, moisture content and profile etc. for optimum adhesion).

Note: Great care must be taken with any additional layers above the main concrete substrate as each is a potential interface/intercoat weakness that could reduce the full bond if not applied correctly.

6.2 SUBSTRATE PRIMING

For the SikaProof P system the main primer is SikaProof Primer-01. Please refer refer to Section 6.1 (above) of this Method Satement 'Substrate Preparation' regarding the appropriate preparation and priming required for each substrate.

The use and application of Sikaproof Primer-01 is as follows:

a) Substrate quality

The substrate must fulfill the defined requirements for SikaProof P as detailed in Section 6.1 of this Method Statement 'Substrate Preparation'. Generally to be:

- Clean, free of any impurities (such as release agents, oil, grease, fuel etc.) and free of any loose particles, dust and dirt
- Minimum surface temperature +5 °C
- Dry, moisture ≤ 5 % by weight
- Dew point: Surface temperature ≥ 3°C above the dew point

b) Application method/procedure

- Stir SikaProof Primer-01 is supplied ready to use, however stir thoroughly when opened immediately prior to application.
- Apply a uniform coat of the primer onto, and completely over the prepared surfaces by brush, roller or spray.

Consumption: approximately 150 – 500 g/m^2 dependent on the profile and porosity of the concrete surface.

Drying time: dependent on the substrate quality, environmental conditions and thickness applied, approximately 30 minutes.

Generally always overcoat within 24 hours, otherwise another coat of primer must be applied.

To check and confirm any details, an initial test on the specific prepared surface is recommended.

For more detailed information please refer to the current PDS for SikaProof Primer-01.

6.3 SEALING AND BONDING OF MEMBRANE JOINTS

All membrane overlap joints, connections and details are bonded and sealed easily, quickly and securely using the self-adhesive membrane sheet SikaProof P-12 itself. Additionally using Sika® sealants (Sikaflex® AT or SikaBond® AT) and the SikaProof® adhesive tapes (SikaProof® ExTape-150, SikaProof® Patch-200 B), particularly to seal membrane T-joints and detailing overlaps. Complex and time consuming membrane welding is not required.

For the post-applied SikaProof P membrane system two different types of overlap joint are possible on site:

A) Overlaps of the membrane sheets

There is a simple overlap joint in both the longitudinal and transverse directions to adhere and seal the membrane sheet system.

- To make it easier and even more secure the membrane has a marked overlap line and an addtitional overlapping adhesive edge in the longitudinal direction. Ensure the overlap is between the two black marked lines for a **minimum overlap of 90 mm**.
- In transverse/crossing and other detailing joints ensure a **minimum overlap of 90mm** by careful measurement.

B) Additional sealing and taping for detailing overlaps

For any detailing overlap joint to adhere and seal the system following the next chart, how to proceed.

It depends on the project exposures / requirements for furhter support please contact your local Sika technician.

Sika recommend:

Selection criteria	**Damp proofing,** no permanent water pressure	**Low demand,** up to 0.5 bar (5m) of water pressure	**High demand,** up to 1.0 bar (10m) of water pressure
T-joints of cross joints (e.g. end of rolls) or detail overlaps (e.g. corners)	None	Patch with SikaProof ExTape-150	Patch with SikaProof ExTape-150 & bead of Sika sealant

General advice and guidelines for bonding and sealing overlaps of SikaProof®membranes

Essential requirements for bonding SikaProof®membrane surfaces:

- Clean surface
- Dry surface, avoid dew point conditions
- Minimum temperature + 5°C

Note: If SikaProof® membrane has to be applied in wet conditions or temperatures below +5°C, exceptions are possible under special circumstances with appropriate precautions – please refer to Sika Technical Services for more information and specific advice.

General procedure:

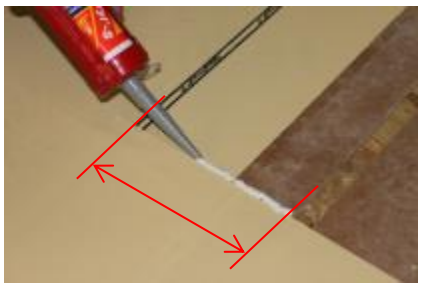
Before the next membrane sheet is overlapped and adhered:

1) Remove the release liner from the adhesive edge.

2) Clean the membrane surface in the overlap area thoroughly.
Clean the membrane surface with a clean, dry, lint-free cloth.
   - To remove light surface soiling use **Sarnafil® T Prep** on the cloth
   - Heavily soiled areas of the membrane surface can be cleaned locally using **Sarnafil® T Clean.** It should be used sparingly and adequate drying / evaporation time allowed.
   - After this local treatment has dried, the areas must be finally cleaned with **Sarnafil® T Prep** prior to bonding.

3) Install the next membrane sheet overlapping the previous, horizontally or vertically.
Make sure that the overlap area is minimum 90mm, meaning only one installation line mark is visible.

4) At transverse or detailing joints apply a bead of sealant.
   - Bead diameter approx. 2-3mm
   - Bead length from the outer installation line mark minimum 150mm inside.



5) Finally press all overlap joints firmly and uniformly with a pressure roller, it is recommended to use the SikaProof Telescopic Roller.

6.4 INSTALLATION METHOD

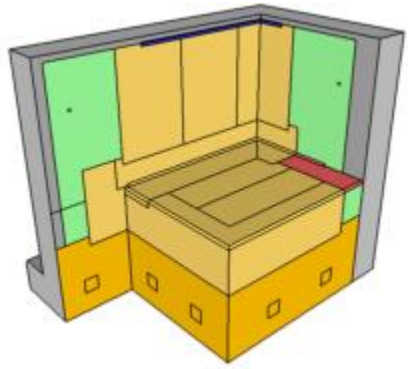
The installation method for SikaProof® P is state of the art for self-adhesive membrane sheets, by peel & stick, with simple and easy fixing and bonding of the membrane onto the prepared concrete surfaces.

The following principles and general installation procedure are recommendations to help achieve a technically correct and fully functional waterproofing system. For any further information please refer to the current version of the respective Product Data Sheet and Application Manual.

General installation procedure:

- First ensure that all of the substrate fulfills the requirements and has been adequately prepared.
- The primed surface is dry and no longer sticky.

A) **Start to apply the corners, edges and details** using the full 1m wide sheets, or only a cut strips of the SikaProof® P membrane as appropriate for the project.



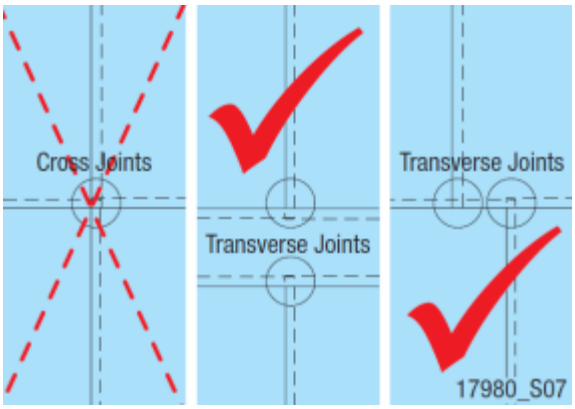
B) **Install the horizontal or/and vertical areas** with the 1.0m wide, SikaProof® P membrane sheets, following the following principles:

- Use the **"Umbrella principle"** always overlapping the upper/top sheet on/over the lower/bottom one and ensure the overlaps are all facing down.
- Prevent any X-joints, **joints must be staggered**. (see graphic)
- Always install sheets **from the lowest to the highest points**.
- Do not bend/apply the membrane over two successive edges.
- Firstly bond the larger parts of the membrane sheet.

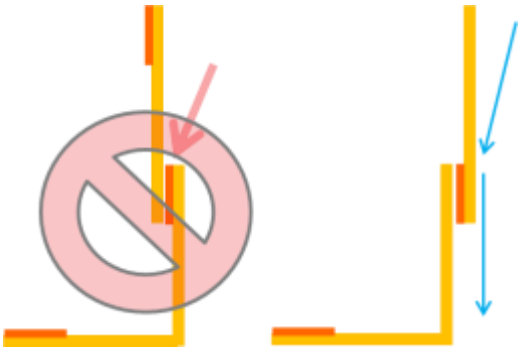
C) **Finally seal all overlap joints and details** according to the described procedure. To ensure the entire system be waterproofed.
Use eigther Sika sealant or / and Sika adhesive tapes.

- After the work is completed, carefully inspect the installed the membrane system to check all the overlap joints, connections and details, to ensure they are correctly installed.
- Protect the SikaProof® P membrane system, especially on horizontal areas, immediately after installation to prevent any mechanical damage and also protect the membrane against UV and weathering exposure. Please refer to the chart in Section 2.2 "Limitations".

No X-joints, always use staggered joints



"Umbrella principle", overlap joints must face down



Edges and Corners

How to create edges and corners are essential, because all structures will necessarily include these details.

There are each two different types of external and internal corners to be aware, see below.

Recommendation: To keep the SikaProof® P membrane system installation procedure simple:

- Creat single single corners pieces
- Do not bend the membrane over two successive corners or edges, especially at base slab edges.
- Adhere first the larger area part of the piece
- First bond and secure the larger area of each membrane piece Finally connect the single corner pieces with a simple membrane sheet evenly cut in half (0.5m), or you can work with the complete 1m wide sheets if this is easier on any project (dependent on the structural design and arrangements etc.).

External Corners

For the detailed installation procedure please refer to the current version of the respective Application Manual.

- Cut smaller single pieces out of a membrane sheet or take an entire 1m wide sheet and cut out the pattern as shown in the graphics above.
- Bond and secure the pieces in the sequence shown above.

Recommendation:

Use SikaProof FixTape-50 to smoothen corners/edges in advance, sealing the top with a patch of SikaProof ExTape-150.

Internal Corners

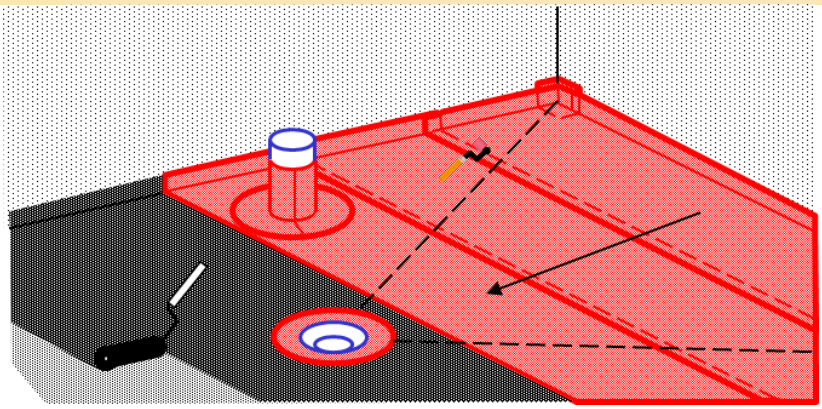
For the detailed installation procedure please refer to the current version of the respective Application Manual.

- Cut smaller single pieces out of a membrane sheet or take an entire 1m wide sheet and cut out the pattern as shown in the graphics above.
- Bond and secure the pieces in the sequence shown above.

Recommendation:

Use SikaProof FixTape-50 to smoothen corners/edges in advance, sealing the top with a patch of SikaProof ExTape-150.

Horizontal Areas



1) Lay out the roll and adjust / position to the previous, adhered sheet.
   - Evenly unroll the entire, or half of the roll to adjust it.

2) Release about 0.5 m of the release liner in the direction of the application, and bond the first part of the membrane sheet properly.

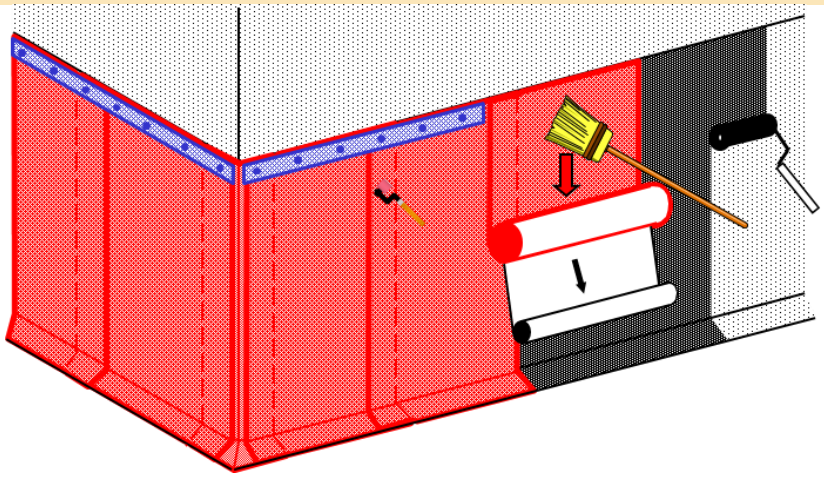
   Important note: Remove the release liner from the adhesive edge.

3) Pull the release liner in the direction of application evently to ensure a constant overlap to the previous sheet. (Wind the release liner onto a pole)

4) Continously press the sheet to the substrate properly to prevent any bubbels and wrinkles. Therefore we recommend to use a brush, wipper to ensure a correct adhesion / bond.

5) Finally all overlap joints (longitudinal and transvers) have to be pressed with a roller properly. (Recommendation SikaProof Teleskopic Roller)

Vertical Areas



- Start and work top down, preferably installing the sheets in a vertical direction.
- Cut the sheet in size or unroll the required length

1) Adjust the sheet to the previous one
2) Release the top approx. 0.5 m of the release liner in the direction of application, and bond the first part of the membrane sheet properly.
3) Pull down the release liner in the direction of application evenly to ensure a constant overlap to the previous sheet.
4) Continously press the sheet onto the substrate firmly to prevent any bubbles and wrinkles.
   Note: We recommend using a suitable brush, squeegee blade to help ensure uniform adhesion / bond.
5) Finally all overlap joints (longitudinal and transverse) have to be pressed again firmly with a roller.
   Recommendation: Use the SikaProof Telescopic Roller.

Sequence 1) and 2)

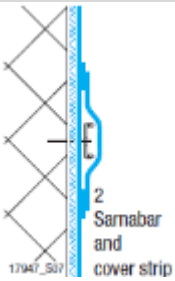
Sequence 3) and 4)

Sequence 5)

Fixation in vertical areas

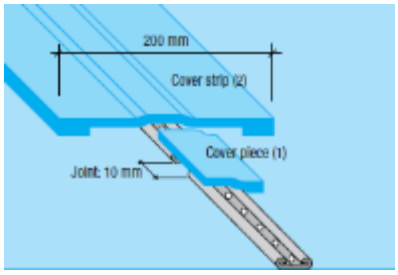
If it is required to mechanically fix the SikaProof® P membrane sheets in vertical areas, for example to:

- prevent detachment – particulalry in summer or hot climates
- prevent creep



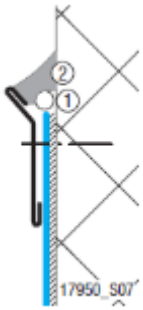
Then we recommend fixing the sheets:

- regularly with linear horizontal Sarnabars
- Within the overlap of the next sheet, or
- With a cut strip of min. 350mm wide, centered and bonded on each side of the bar for a min. 150mm
- Cover, smoothen and protect the ends of the bar with a piece of SikaProof FixTape-50



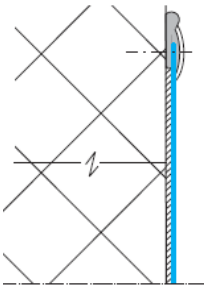
Termination of sheets

Secure terminations of the SikaProof P system are essential for a secure and durable waterproofing system. The two recommended options are:



1) Sealing with counter flashings:

- Flashings (metal sheet) cut to size
- Mechanically fixed regularly
- Top-sealed with a sealant joint (including backing strip, primer etc., as required)



2) Sealant packing with fastening bars:

- Apply a bead of sealant (including the appropriate backing strip and primer) along the top edge of the sheet
- Install the bar over the sealant bead (if a perforated bar is used, also pack / seal under the entire bar with the sealant)

6.5 STANDARD DETAILS

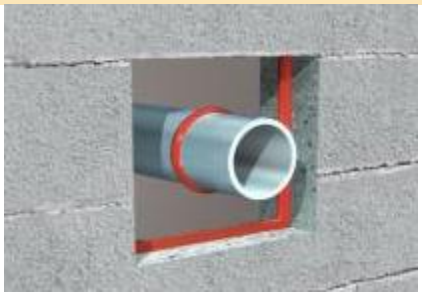
Attention to details is always the key to successful waterproofing and therefore the design and execution of each individual detail is important. This section shows how to create and install the recommended standard details for the SikaProof® P membrane system.

If there are further details to design you can also contact your local Sika Technical Services Department for advice.

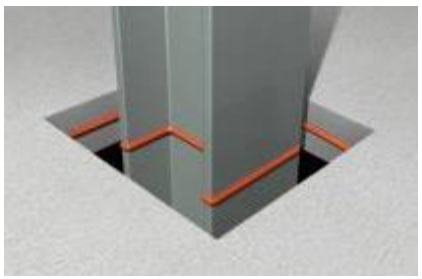
Penetrations

In general any penetration has to be sealed. And the best detailing solution depands on:

- Grade of exposure and project requirments
- Type of pipe, cables, wires or beam e.g. flexible or rigit material etc.
- Design of the penetration, e.g. is there a sleeve.



Generally all penetrations require additional sealing with a joint sealing solution, at the minimum this means a SikaSwell Profile / Ring / Sealant.

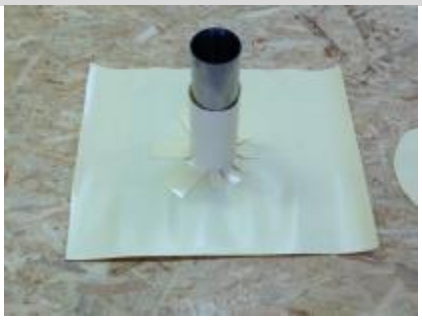


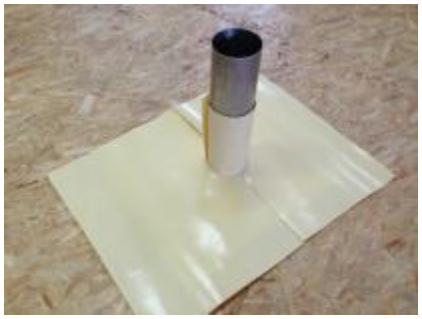
Important note:

For any specific and complex penetration details, e.g. steel beams with H profiles, flexible ducts, wires and cablesetc., these will have to be detailed and sealed individually as appropriate –Therefore, for any such details please contact your local Sika Technical Services Department.

Pipe penetrations

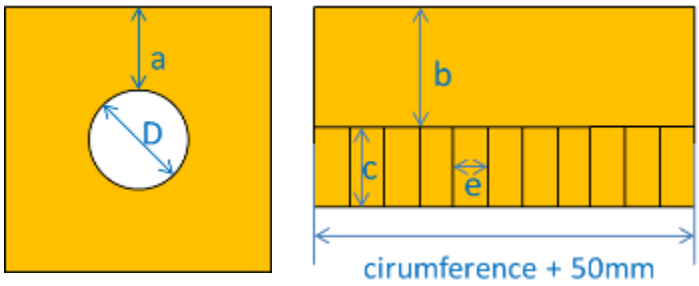
For waterproofing with low demand (less than 5m or 0.5 bar water pressure) this solution with SikaProof® P membrane could be used. If there are high requirements than use Sikadur® Combiflex SG system to seal any penetration.





Recommended procedure how to design and install the detail:

1) Clean the concrete and pipe surface thoroughly, refer to Section 6.2 Substrate preparation.
2) Apply SikaProof Primer-01 on the concrete and an appropriate primer on the pipe (depending on the pipe material, refer to the Sika Primer chart)
3) Cut a single rectangular piece of SikaProof P with a hole of the pipe diameter, see pattern below.
   Dimensions: a = min. 150mm; D = outer pipe diameter
4) Pull the single piece over the pipe and adhere it properly onto the primed concrete.
   Remark: if the entire pipe is still installed (not only a stub), cut the recutangular piece in two halves with a overlap of minimum 20mm.
5) Cut another rectangular piece of SikaProof P membrane, see pattern below. *Dimensions: b = min. 150mm; c = 50mm ; e = min. 20mm, depends on the pipe diameter.*
6) Wrap this piece around the pipe evenly and completely.
7) Install a strip of SikaProof FixTape-50 and/or Sika sealant around the base of the pipe, sealing any gap and smoothening the edge (remove the release liner)
8) To finish it apply SikaProof ExTape-150 tangential on the bottom as close around the pipe.
9) For a durable termination at the pipe, using a screw clamp.



Anchor penetrations

All anchors have to be rigid and stable, therefore we recommend to seal it with Sikadur Combiflex SG system.

If the requirement is low, only for damp proofing, then use a strip of SikaProof FixTape-50.

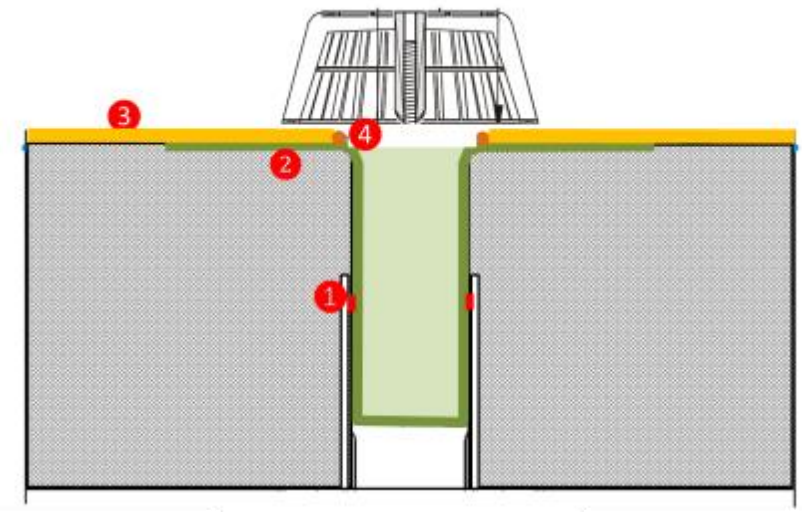
Important note:
Any cut or hole in the SikaProof P membrane sheet should be as small/ less as possible. Otherwise another extra piece should be applied on top to seal it properly.

Drains & Overflows

Drains are only present in drained ground, without permanent water head. Here we adapt the Sarnafil drain solution used successfully for many years in roof waterproofing. Therefore it is recommended to use prefabricated Sarnafil T Drain form pieces.

How to install this system, includes the planning of the already installed pipe connections with its sleeve. Therefore refer to the current Method Statement.

General recommended procedure how to install:



1) Existing drain/pipe connection with sealing gasket (provided by main contractor)
2) First of all the Sarnafil Drain piece has to be fixed by fully adhering to the concrete. (to prevent any water underflow)

Recommendation: Make sure the tablet is not upstanding to prevent any standing water.

3) Cut and bond an extra membrane piece on the drain piece and the prepared concrete surfache, size approx. 200mm wider as the base plate. The drain hole in the membrane sheet should be minimum 20mm samler than the drain diameter.
4) Finaly seal the gap around with Sika sealant.

Construction joints

As already mention in the Section “4.2 Requirements for post-applied systems” it is strongly recommended to use an additional joint sealing solution for all construction joints, in minimum with a SikaSwell Profile/Sealant.

This has to be taken in consideration in early stage of the project, especially the joint sealing system has to be pre installed before concrete is casted.

For special detailing designs at construction joints and junctions, please contact your local Sika Technical Services Department for advice.

Expansion joints

For the secure sealing of expansion joints in most watertight structures it essential to use external **Sika® WT Waterbars** for additional pre-sealing and optimum movement accommodation. The **Sika® WT Tape** can also be used in projects with lower water pressure demands.

Therefore all normal watertight construction standards and engineered joint waterproofing details and dimensions are required in accordance with national and international standards. For further information regarding the design of expansion joints please refer to the Method Statements for Sika’s engineered joint waterproofing and sealing solutions.

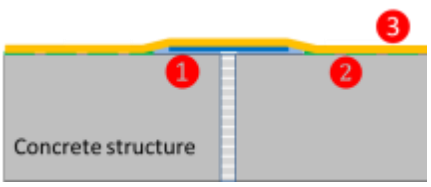
Note: If high elongations and exposure demands are anticipated, first install a single SikaProof P membrane sheet (1m wide) along the expansion joint directly over the separation liner.

Pre-installed Sika WT Waterbar

General procedure (similar graph as shown beside):

1) Install the Sika waterbar already before concrete is casted, in the previous stage.
2) Surface treatment and priming the concrete surface. Clean the waterbar surface.
3) The membrane sheets can then simply be applied continuously over the waterbar and the joint.

Post-installed WT Tape



For detailed information on the application of the Sika WT Tape please refer to the current Method Statement. Here the use and installation of the SikaProof P membrane sheet is described in outline:

1) Apply the Sika WT Tape, according its procedure.
2) Surface treatment and priming the concrete surface.
3) The membrane sheets can then simply be applied continuously over the joint.

6.6 PROTECTION & REPAIR

Basically it should always be a clear goal to prevent any requirement for further repair works to be necessary on the installed **SikaProof® P** membrane system.

A) When and how to protect?

Apart from the defined limitations of weather exposure, it has to be a priority to protect the SikaProof® P membrane as soon as possible after the installation.

As for all other membrane waterproofing systems, the **SikaProof® P** membrane system must be protected against any damage including:

- mechanical or other damage during construction
- from the backfill material / process
- settlement/friction from the ground (incl. separation layer)

The protection layer therefore has to be resistant to and withstand all of the following:

- The backfill particle /aggregate diameter/shape
- The nature of the fill/soil
- The method of compaction
- The anticipated level of settelment/friction

The following ancillary products are available to protect the **SikaProof® P** membrane system:

- **Sika® Drain-850 Geo**
- **Sikaplan® WT Protection sheet**
- **Sikaplan® W Tundrain**
- **Sikaplan® W Felts**
- Other geotextiles > 800 g/m^2
- Other insulation boards > 50 mm

Important note:

During and after the installation of the **SikaProof® P** membrane system there are no other trades or heavy equipment allowed into the installation area at any time.

- If required and accepted by the waterproofing contractor, the following may be permitted:
  - Other trades with lightweight materials and equipment could work on sufficiently protected areas.
  - Welding works with special attention and protection.
- No heavy equipment is allowed on the membrane at all.

For areas which are permanently subject to traffic load, a separate and additional protection screed or slab is recommended.

B) When and how to repair during installation phase?

Any damage to the **SikaProof®** membrane system must be repaired to achieve and maintain a secure watertight waterproofing system. This is despite the fact that the full bond prevents any lateral water migration, in order to ensure that the structure remains durable, watertight and protected by the **SikaProof® P** sheet membrane waterproofing system.

See the **SikaProof® P** repair procedures in the guide below:

Repair after installation (only for double-sided formwork)		
Inadequate/incorrect bond of overlaps:	Membrane damage:	De-bonding, inadequate bond to the concrete:
Slight delamination, adhesion still ≥ 60 mm ► Clean the overlap Use an additional **SikaProof® ExTape-150**	Any membrane damage must be repaired by bonding and sealing ► using • Strips/patchs of **SikaProof® P** membrane • **SikaProof® Patch-200 B** • Overlap of the patch piece minimal 100mm	Small areas of de-bonding, blisters diameter ≤ 100 mm with intact membrane ► No damage, no repair needed!
Delamination of overlap joint ► Clean the overlap Bond & seal it again with an additional • Strip of **SikaProof® P** • **SikaProof® Patch-200 B**		Any de-bonding, blisters diameter less than 1.0 sqm with or without intact membrane ► Repair is optional, depending on the project performance requirements. ► For a durable bond, remove the failed area and reseal with a new sheet/strip/ patch of **SikaProof® P**
		Any de-bonding, with bubbles larger than 1.0 sqm ► For a durable bond, remove the failed area and reseal with a new sheet/strip/ patch of **SikaProof® P**

C) **Repair during service life**

If any damage occurs throughout the service life, the damage is limited to the area of the damage only, due to the full bond of the **SikaProof® A&P** membrane system, which prevents any lateral water underflow.

- Additional sealing or resealing of any joints is essential to prevent any leaks (construction, movement and connection joints).
- Any locally damaged areas or cracks can easily be sealed e.g. by localised injection.

For more information on Sika's injection resin solutions please contact your local Sika Technical Services Department.

7 INSPECTION AND QUALITY CONTROL

The SikaProof® P system must only be installed by Sika trained contractors. As a rule, a continuous workflow during the installation and following a pre-defined working procedure is best to avoid any mistakes. Sika recommends that all contractors should record all relevant installation details and site conditions etc., in a written record with pictures, to help to ensure successful completion and to provide a useful future reference for the owner.

A) **Substrate Inspection**

Immediately before installation begins the substrate has to be given a final inspection to confirm that it is ready for the installation.

A check list for this is very useful and recommended as follows.

The substrate must meet the following requirements:

- Hardened and of sufficient compressive strength, minimum 25 N/mm^2
- Minimum pull off strength, 1.5 N/mm^2
- Dry, moisture ≤ 5 % by weight
- Dew point: Surface temperature ≥ 3°C above the dew point (refer to the dew point chart attached)
- Minimum surface temperature +5 °C
- Sound, even, level and without surface defects (such as blowholes, voids, honeycombing, cracks, protrusions, etc.), surface roughness S_R ≤ 1.5 mm (see below)
- Clean, free of any contaminants that could prevent or reduce adhesion (such as release agents, oil, grease, fuel etc.) and free of any loose or friable particles, dust and dirt.

B) Final Inspection

After the membrane installation is completed

When installation is completed, quality control checks on the system can be conducted by means of a visual inspection of the entire surface, paying particular attention to the bonded joints.

Important Note:

This inspection is essential due to the fact, that the contractor has no further opportunity to influence the success of the fully and permanently bonded waterproofing system, as the Main Contractor and all of the following trades that potentially have to work over the **SikaProof® P** membrane, are beyond their control and responsibility.

Checklist for inspection after installation:

- The installation is complete in all areas without any damage
- All self-adhesive strips are fully bonded
- All detailing tapes and connections have been correctly bonded.
- All details are completely and properly done
- All release liners, excess and waste materials, plus any other debris is removed from the **SikaProof® P** membrane system.
- The membrane is protected according and within the defined periode.

Before backfilling

If the protection of the **SikaProof® P** membrane is not applied as part of the membrane system installation, then it is recommended to inspect the applied system again completely before the protection against backfilling is installed. Any damage can then be identified and repaired.

Finally the membrane system must be protected within the defined exposure limitation, see Section 2.2 Limitation.

8 EQUIPMENT, TOOLS

SikaProof® P membrane system is no welded, it is an easy, fast and secure system that is simply bonded and sealed. For correct and secure installation the following basic tools are required, no special equipment is used:

- Tape measure
- Marking pen
- Membrane cutter
- Scissors
- Small pressure roller
- Telescopic roller
- Metal straight edge for cutting
- Protective sheet for cutting on clean, dry cloth
- Brush or rubber blade
- Cartridge gun for sealant
- Paint roller for primer

- **SikaProof® Teleskopic Roller (500714)**
  Additional telescopic roller handle and lager pressure roller for easier, secure bonding of all overlap joints.
  (SSC, Sika Supply Center, Article available)

- Installation trolley for easier membrane roll out and installation, also including rollers for the **SikaProof® P** detailing tapes.

- Wooden handles for easier carrying of rolls.

9 CERTIFICATES & APPROVALS

Fully bonded sheet membrane waterproofing systems for basements, such as SikaProof® P-12, are not yet subject to any agreed International Standards. Therefore existing tests and standards were adapted to assess and confirm the system's suitability in terms of its watertightness and fully bonded performance. These include:

Europe

- Product Declaration EN 13967:2012 – Flexible sheets for waterproofing
  CE Certificate No. 1349-CPD-065
- German function tests, test institute Wissbau Beratende Ing.-GmbH
  Function test for SikaProof® P-12, report no. 2013-253

North America

- Function test according ASTM Test D 5385 modified, Sika MPL (internal material test lab) Zürich

10 LEGAL NOTE

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