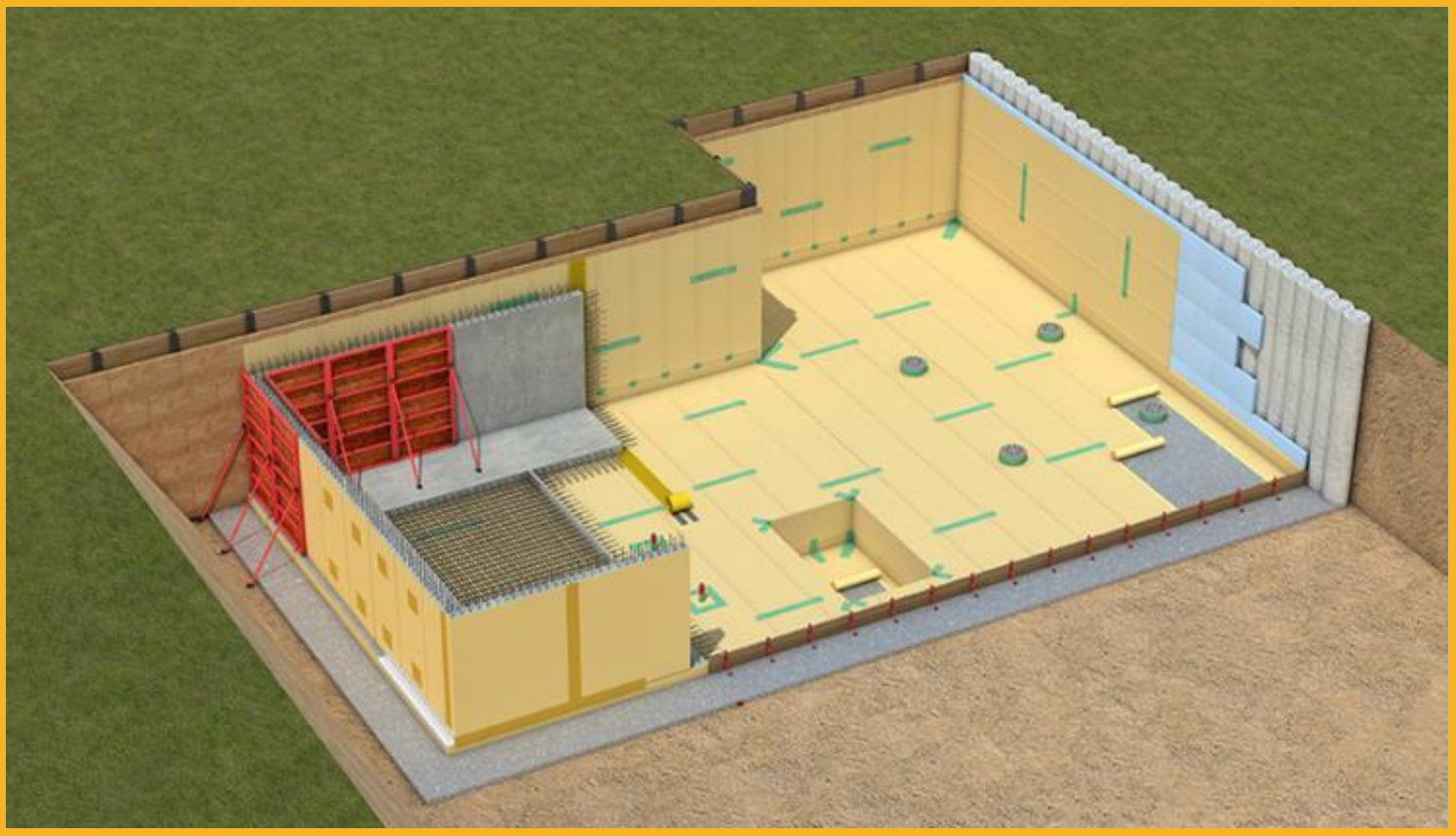

METHOD STATEMENT
SikaProof® A

09.08.2019/ V05 / SIKA UK / STEPHEN ARMFIELD

BUILDING TRUST

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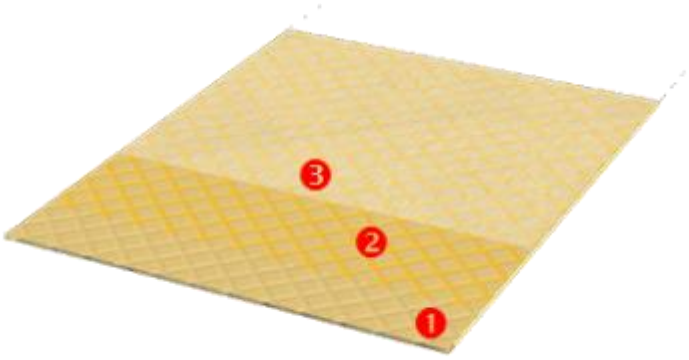
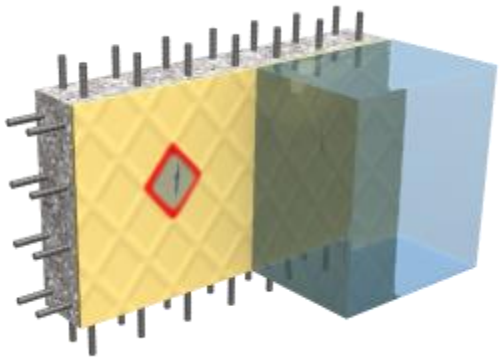
1 SCOPE

This Method Statement describes the system and installation procedure of the SikaProof®A membrane waterproofing system.

2 SYSTEM DESCRIPTION





SikaProof® A is a fully and permanently bonded, flexible sheet membrane waterproofing system. It consists of an **embossed flexible polyolefin (FPO) membrane (1)** laminated with a **unique polyolefin (PO) sealant (2)** applied in a fine grid pattern and a **non-woven, strengthened polypropylene (PP) fleece (3)**.

The SikaProof® A system is a cold- and pre-applied waterproofing system that is designed for installation before the steel reinforcement is fixed and the structural concrete is poured. The concrete is poured directly onto the SikaProof® A membrane system, the fresh concrete is embedded completely into the fleece and creates a permanent mechanical bond.

The mechanical bond together with the sealant grid (Sika Grid Seal Technology) prevents any lateral water underflow between the SikaProof® A membrane system and the hardened reinforced concrete of the structure.

To seal and bond the overlap joints and detail connections of the SikaProof® A system, special SikaProof® adhesive tapes are used, no heat welding is required.

To adhere and seal the overlaps of the membrane sheets in a longitudinal direction, use the integral self-adhesive strip on one side of the sheet and to adhere and seal transverse joints or detailing joints/connections use the two special SikaProof® detailing tapes, SikaProof® Tape-150 A and SikaProof® ExTape-150.

USES

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

- Below ground reinforced concrete slabs
- Below ground reinforced concrete walls with both single and double -faced formwork
- Extensions and reconstruction works
- For prefabricated constructions / precast elements

CHARACTERISTICS/ ADVANTAGES

- Cold-applied (no pre-heating or open flames) and pre-applied, before the reinforcement is fixed and the concrete is poured
- 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 many different standards
- Easy to install with fully adhered joints (no welding required)
- Temporary weathering and UV-resistant during the installation / construction works
- Resistant to ageing

- High flexibility and crack-bridging abilities
- Resistant to aggressive natural mediums in ground water and soil
- Can be combined with other approved Sika waterproofing systems including:
    - Sikaplan® WT membranes, FPO-based sheet waterproofing membranes
    - Sikadur-Combiflex SG system, FPO-based joint sealing system

2.1 REFERENCES

Europe

- Product Declaration EN 13967 – Flexible sheets for waterproofing (type A&T), CE Certificate No. 1349-CPD-065
- German function tests for system and standard details – Test lab Wissbau Beratende Ing.-GmbH
- German „allgemeines bauaufsichtliches Prüfzeugnis“ (abP), MPA NRW No. P-22-MPANRW-8600
- BBA, British Board of Agrément technical approval for construction, Agrément Certificate 13/5075
- Cahier des Charges, French approval CCT 57 by Enquête de Technique Nouvelle Socotec No. EAD9247/2

North America

- ASTM Test D 5385 modified (Resistance to lateral water underflow)
- ASTM Testing, Nelson Testing Lab, Reports No. 1240-13 A, B and C

Asia Pacific

- BRANZ approval No. 852 (2014), New Zealand

2.2 LIMITATIONS

Limitations for suitable applications and use of the system are described in the Product Data Sheet (PDS) of SikaProof® A. Please refer to the current PDS version regarding relevant limits of:

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

Regarding the temporary UV and weathering resistance of the **SikaProof® A** system during installation and construction works, the following limitations must be taken into consideration.

The **SikaProof® A** membrane system has to be protected:

Country / Climate	after membrane installation and before concreting	after removing formwork and before backfilling
	“inside” fleece side	“outside” membrane side
Northern & Central Europe including France, Italy (except South), Croatia, Bosnia Herzegovina, Serbia, Romania, Ukraine plus Russia, Japan, Korea, Mongolia, New Zealand, Canada, northern states USA	30 days	90 days
Southern Europe including Spain, Southern Italy, Albania, Greece, Bulgaria, Turkey plus Near & Middle East, India, Southern Asia, Australia, Northern Asia, USA (exception North), Latin & Central America	14 days	90 days
If the membranes will be exposed for a longer period then additional temporary protection must be provided. See also Section 6.5	The complete area has to be protected, e.g. with UV resistant foil/geotextile	The complete area has to be protected, e.g. with UV resistant foil/geotextile

3 PRODUCTS & SYSTEM

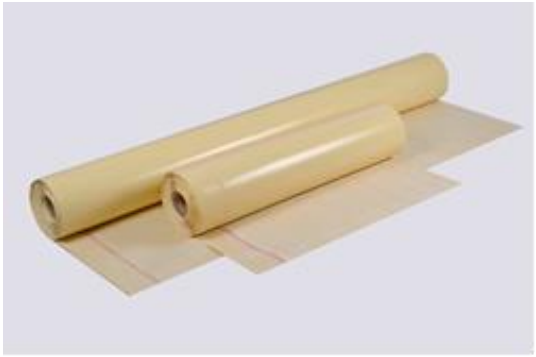
3.1 SYSTEM COMPONENTS

The **SikaProof® A** system consists of the following system components:

a) **SikaProof® A** membrane
b) **Detailing tapes** for sealing and bonding the joints (**always essential!**)
c) **Accessories** for sealing details (as required)

a) **SikaProof® A membrane**
Supplied in 1.0 and 2.0 m width rolls with a prefabricated self-adhesive strip on one side, available in three different membrane thicknesses as outlined below:

- SikaProof® A-05
- SikaProof® A-08
- SikaProof® A-12



The **SikaProof® A** membrane range consists of:

	SikaProof® A-05	SikaProof® A-08	SikaProof® A-12
Membrane thickness [mm]	0.50	0.80	1.20
Total sheet thickness [mm]	1.10	1.35	1.70
Roll length [m]	30	25	20
Roll width [m]	1.0 / 2.0	1.0 / 2.0	1.0 / 2.0
Roll weight [kg]	24 / 48	28.7 / 57.5	30 / 60

b) SikaProof® detailing tapes (required system components)

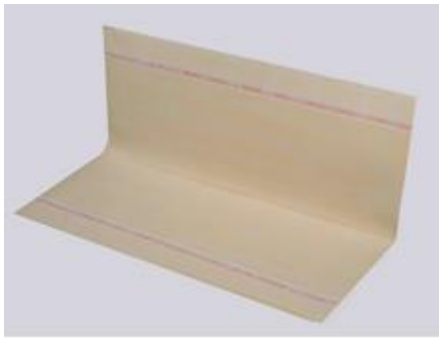
SikaProof® Tape-150 A
Polyacrylate based self-adhesive tape component of the SikaProof® fully bonded membrane system for creating a mechanical bond to the concrete structure for internal jointing on the white fleece side of the SikaProof® A membrane sheets.

SikaProof® ExTape-150
Butyl rubber based self-adhesive tape for external jointing on the yellow membrane side of the SikaProof® A membrane sheets.

SikaProof® A detailing tape range:

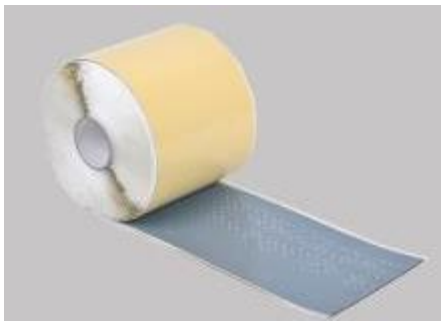
	SikaProof® Tape-150 A (529895)	**SikaProof® ExTape-150** (424705)
Colour	Yellow	Yellow
Tape thickness, total [mm]	1.70	1.10
Roll width [mm]	150	150
Roll length [m]	25	20
Packaging-units per box	2 rolls (50m)	4 rolls (80m)

a) System Accessories (as required)



SikaProof® A-08 / -12 Edge
Prefabricated L-shaped sheets, 1.0 wide, folded in 50/50 cm with self-adhesive strips on both sides,
available in two different membrane thicknesses:

- SikaProof® A-08 Edge (424689)
- SikaProof® A-12 Edge (424687)



SikaProof® Patch-200 B (457589)
Externally applied, butyl based, self-adhesive patches, 200 mm wide, on 1.2 mm thick membrane, for any additional post sealing of joints, penetrations or damage to the membrane.

SikaProof® Patch-200 (424704) this earlier product is now deleted.

SikaProof® FixTape-50 (424701)
Double sided-adhesive tape strip, 50 mm wide for other different detailing and sealing applications.

3.2 STORAGE CONDITIONS / SHELF LIFE

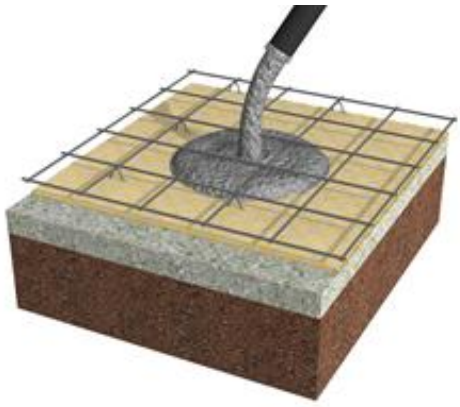
All SikaProof® A membrane system components have a shelf life (see chart below) from their date of production, if stored properly in unopened undamaged original packaging, in a horizontal position, in dry conditions and at temperatures between +5°C and +30°C. They must also be protected from direct sunlight,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

	Shelf Life
SikaProof® A-05/-08/-12 membranes & Edge sheet	18 months
SikaProof® Tape-150 A	18 months
SikaProof® ExTape-150	24 months
SikaProof® Patch-200 B	18 months
SikaProof® FixTape-50	24 months
SikaProof® MetalSheet	18 months

3.3 SYSTEM BUILD-UP

The **SikaProof® A** system is a cold- and pre-applied waterproofing system that is designed for installation as a single-ply membrane loosely laid on the prepared substrate before the steel reinforcement is fixed and the structural concrete is poured.

In order to achieve full and permanent bond to the concrete structure, it is essential that the fresh concrete is cast directly onto the installed membrane system. To achieve a complete embedding of the concrete binder matrix in the fleece backing of the SikaProof® A membrane.



3.4 CONCRETE QUALITY

The concrete quality is also key factor for a successful waterproofing system, to enable a full, mechanical and permanent bonded solution, without any lateral water underflow or migration between the **SikaProof® A** membrane and the concrete structure.

The concrete particularly the binder matrix of the concrete has to penetrate into and fully embed the fleece backing of the **SikaProof® A** membrane and produce a compact and homogenous layer on the surface of the structural concrete.

Concrete mix designs vary from region to region according to the available raw materials and the 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 works and creates a fully bonded system together with **SikaProof® A**.

The following requirements must be fulfilled for a proper function of fully bond:

- The **concrete structure** to be waterproofed has to be:
  - Sufficiently reinforced concrete to be stable, minimum thickness for new constructions 100 mm or higher.
  - Minimum 100 mm thick structures for refurbishment (lower concrete thickness results in low concrete embedding of the **SikaProof® A** fleece backing, and thus in limited fully bond)
- The **concrete mix design** needs to fulfil:
  - Standard construction concrete mix design requirements according to the relevant local standards and the available raw materials. Please also refer to the Sika "Concrete Handbook" and "Concrete Mix Design Calculator" for more specific concrete advice or contact your local Sika Concrete Specialist.
  - For example: The function tests according to ASTM D 5385 mod performed in the Sika Concrete Lab in Zurich use the following standard concrete mix design:
    - *Aggregates max. Ø 32 mm, well graded sieve curve (according to EN 480-1)*
    - *Cement type CEM I 42.5 N, content 320 kg/m³, w/c = 0.46*
    - *Admixture Sika® ViscoCrete®*
    - *Concrete consistence, flow class F3 (flow diameter 400-450mm)*
    - *Concrete density ≥ 2'000 kg/m3*
- The **concrete workmanship** is the key: well placed, compacted/vibrated and cured concrete is essential for a proper concrete structure and optimal bond of the **SikaProof® A** membrane system.

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 and the correct thickness of the SikaProof® A membrane waterproofing 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® A system, such as excavation dewatering systems, or potential damage or loading on the membrane etc.

Selection of the SikaProof® A membrane system

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

The different levels of exposure and the requirements of the construction process are also important in defining the correct SikaProof® A membrane system. 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 SikaProof® A membrane type. This list is not exhaustive.

General selection guide:

Selection criteria	**SikaProof® A-05**	**SikaProof® A-08**	**SikaProof® A-12**
Typical uses	Damp proofing / waterproofing / concrete protection	Waterproofing for civil engineering structures	Waterproofing for civil engineering structures
Typical applications	▪ **Slabs on grade (only for damp proofing)** ▪ **Walls** ▪ **Precast elements**	▪ **Base slabs** ▪ **Walls** ▪ **Precast elements**	▪ **Base slabs** ▪ **Walls** ▪ **Precast elements**
Maximum head of water (water pressure)	**≤ 5 m (≤ 0.5 bar)**	**≤ 10 m (≤ 1.0 bar)**	**≤ 15 m (≤ 1.5 bar)**
Crack-bridging ability	**Not tested**	**≤ 1 mm**	**≤ 2 mm**

Radon & Methane & CO2 Gas Barrier	Not tested	Tested	Tested

5 ENVIROMENT, 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. Excepting to comply with any specific local regulations or requirements.

- 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.

5.3 CLEANING OF TOOLS

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

6 APPLICATION & INSTALLATION

SikaProof® A is a cold- and pre-applied waterproofing system that is installed as loosely laid, single-ply membranes onto prepared substrates before the steel reinforcement is fixed and the concrete is poured.

SikaProof® A membranes must be installed with the fleece side upwards and positioned so that it will be in direct contact with the structural concrete when it is poured.

Membrane overlap joints and other detailing connections are sealed and bonded using the integral self-adhesive strips on the membranes, and / or by using the SikaProof® adhesive tapes, SikaProof® Tape-150 A and SikaProof® ExTape-150. Complex and time consuming membrane welding is not required.

6.1 SUBSTRATE PREPARATION

Substrates for installation of the SikaProof® A membrane system need to have sufficient stability to avoid movement during the installation and subsequent construction works, including the concreting. The requirements for substates and their preparation include the following:

- A smooth, uniform and clean substrate surface is essential to prevent membrane damage.
- The substrate should be free from oil and grease, dust and any other loose particles.
- Large gaps and voids (> 12-15 mm) must be pre-filled before the installation.
- The substrate can be damp or slightly wet, but ponding water must be avoided.
- The substrate temperature must be above +5°C

Suitable substrates:

- Concrete blinding with a smooth surface finish (an additional geotextile layer is recommended, > 300g/m2 dependent on the blinding)
- Formwork
- Rigid thermal insulation
- Plywood
- Compacted soil/fill with geotextile > 500g/m2 (only for limited requirements)

If there is an uneven, rough surface or ponding water, then an additional protection or drainage layer is required, e.g.

- Sikaplan® WT Protection sheet
- Sikaplan® W Tundrain
- Sikaplan® W Felts or Geotextile > 500g/m2

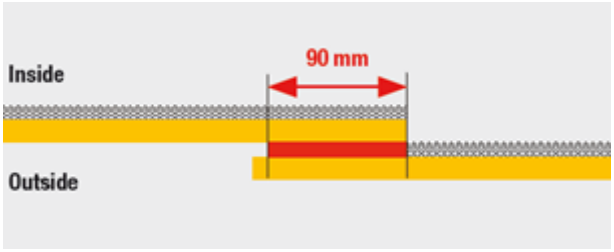
6.2 SEALING AND BONDING OF MEMBRANE JOINTS

All membrane overlaps joints, connections and details are sealed and bonded easily, quickly and securely using the integral self-adhesive strips on the membranes or by using the adhesive detailing tapes, SikaProof® Tape-150 A and SikaProof® ExTape-150. Complex and time consuming membrane welding is not required.

A) Self-adhesive strips

All **SikaProof® A** membranes have an integral self-adhesive strip on one side in the longitudinal direction.

Only the L-shaped **SikaProof® A Edge** sheets have a self-adhesive strip on both sides.



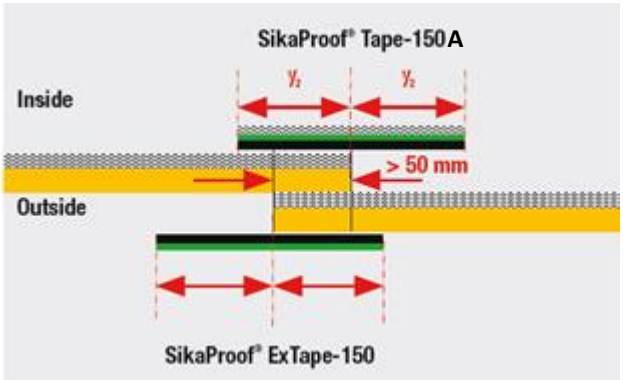
The overlap of **SikaProof® A** membrane sheets have to be:

- Between two red line installation marks, and
- One red line must be visible (minimum overlap 90 mm)

B) Detailing tapes

For sealing cross/transverse joints of **SikaProof® A** membranes e.g. at the end of the rolls, or for detailing, specially designed adhesive tapes are used:

- Internally applied **SikaProof® Tape-150 A**
- Externally applied **SikaProof® ExTape-150**



The detailing tapes must always be properly installed they are positioned:

- Centred over the overlap joints
- With a minimum overlap of 5 cm lengthwise

General advice and guidelines for sealing and bonding of the SikaProof® A membrane:

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.

Essential requirements for bonding surfaces:

- Clean surface
- Dry surface, respect the dew point
- Minimal temperature + 5°C

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

1. Release the protective liners over the adhesive strips/tapes just before you want to bond them together.

The membrane surfaces must be:

- Clean and dry
- Free from dust, dirt and any other materials that could impair adhesion
- At a surface temperature above +5 °C

2. Due to the PSA (pressure sensitive adhesive) use a pressure roller to press the joint overlaps firmly together, for optimal, secure adhesion.

Tip: Use telescopic handles with the rollers for easy, quick and secure installation of the membranes on larger areas and use smaller mini-rollers for detailing works.

6.3 INSTALLATION METHOD

The following installation procedure applies only the SikaProof® A system. It is different from the installation procedure of other waterproofing membrane systems, such as the Sikaplan® sheet membrane systems.
For further information please refer to the latest and current edition of the Product Data Sheet and Application Manual.

General installation procedure:

- First ensure the substrates fulfil the requirements, see Section 6.1.

1. Install the prefabricated L-shaped **SikaProof® A-08 / A-12 Edge** sheets, or use standard **SikaProof® A** membrane sheets, for the perimeter edges and connections on the walls and upstands.

2. Form separate single internal and external corner pieces with **SikaProof® A-08 / A-12 Edge** sheets, or form standard **SikaProof® A** membrane sheets. Connect the corner pieces with the next edge sheets using the detailing tapes, externally **SikaProof® ExTape-150** and internally **SikaProof® Tape-150 A**.

3. Lay out the **SikaProof® A** membrane sheets in the area (horizontal or vertical) using 1.0 or 2.0 m width rolls (as appropriate) and bond the sheets together using the self-adhesive strips lengthways and using the detailing tapes for transverse joints, externally with **SikaProof® ExTape-150** and internally with **SikaProof® Tape-150 A.**

4. Form all of the necessary details, such as pipe penetrations, connections, sumps or lift pits, pile caps, expansion joints and any others that are required using the appropriate **SikaProof® A** system accessory products and other compatible Sika waterproofing solutions, see Section 6.4.

- After the installation is completed inspect the installed **SikaProof® A** membrane system to check all the overlap joints, connections and details, to ensure they are correctly installed.
- After the reinforcement is fixed and before the concrete is poured a finally inspection is recommended to check if there is any damage or anything that could negatively influence the full bond (e.g. separation/protection layers) of the **SikaProof® A** system to the structural concrete.
  See Section 8 “Inspection, Quality Control”

5. After removing the formwork all penetrations (such as tie-bars), any construction or expansion joints, plus any membrane damage has to be sealed using the appropriate **SikaProof® A** accessories or complementary Sika waterproofing solution, e.g. **SikaProof® Patch-200 B** or the **Sikadur® Combiflex SG** system, see Section 6.4.

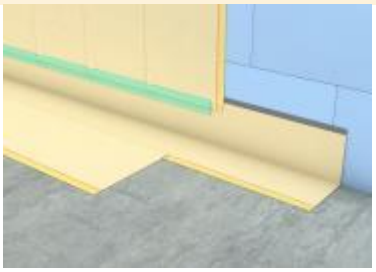
- After removing the formwork the **SikaProof® A** membrane system has to be inspected and repaired if any damage has occurred. Finally the membrane has to be protected within the defined limited exposure period, see Section 2.2.
- Before backfilling the structure, the **SikaProof® A** membrane has to be protected, see Section 6.5.

1. Installation of the perimeter edges
2. Form the inside & outside corners
3. Installation of membrane sheets
4. Install the details
5. Post sealing & protection

1. Installation of the perimeter edges

For fast and easy installation of the perimeter, edges, connections and to form all of the corners use

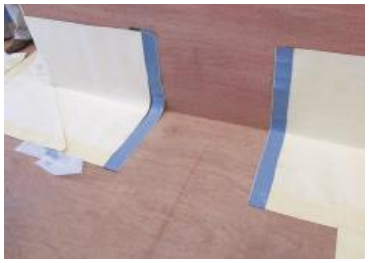
- **SikaProof® A-08 / A-12 Edge** sheets, or
- standard **SikaProof® A** membrane sheets, in 1.0 or 2.0 m widths



1. First apply **SikaProof® ExTape-150** on all ends without a self-adhesive strip, bond this externally onto the membrane side, see Section 6.2. B).
2. Fix the membrane sheets on the vertical prepared substrate, by bonding the sheets in the outer side of the tapes, see below Section “fastening in vertical areas”.
3. Position and fit the sheets to the edges (with a minimal fillet / radius curve)
4. Ballast by holding down with suitable weights (e.g. wooden beams/boards).

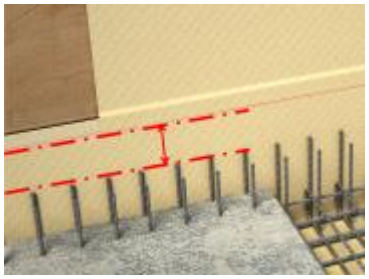
The edge sheets are easily connected lengthways to the next membrane sheets in the area (horizontal or vertical) by the integral self-adhesive strips on each side.

To connect the edge sheets lengthways to the next edge sheet or to single corner pieces use the detailing tapes (externally **SikaProof® ExTape-150** and internally **SikaProof® Tape-150 A)**, see section 3b) “transverse joints”.



To simplify the installation between concrete stages, e.g. horizontal slabs and vertical walls:

- Overlap the starter bars with the membrane by a minimum of 200 mm
- Alternatively overlap the base slab by a minimum 500 mm



Tip: For thicker slabs, we recommend using a 2.0 m wide membrane sheet or to connect the edge sheet (1.0 m wide) with another standard 1.0 m wide sheet to position over top of the starter bars.

2. Form the internal & external corners

For fast, easy and secure installation of the corners use

- **SikaProof® A-08 / A-12 Edge** sheets
- standard **SikaProof® A** membrane sheets, in 1.0 m wide

Always preform each single corner pieces in a clean working area away from any dusty or dirt on the site.

We recommend you prepare a separate protected location and provide a table with a large clean work surface and straight edges including the vertical sides (see picture inset).

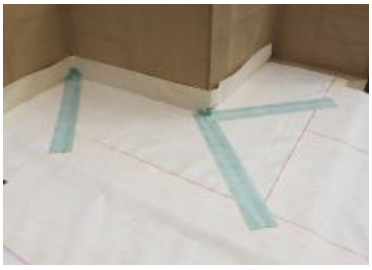
Corner installation procedure:

A) A Take a piece of **SikaProof® A** sheet to cut and form the:
- Internal corners 1.40 m minimum length
- External corners 0.90 m minimum length

B) Bond the **SikaProof® ExTape-150** externally to each side of the cut pieces except any sides with the self-adhesive strip. On site this single corner piece can then be overlapped and connected to the subsequent edge sheets.

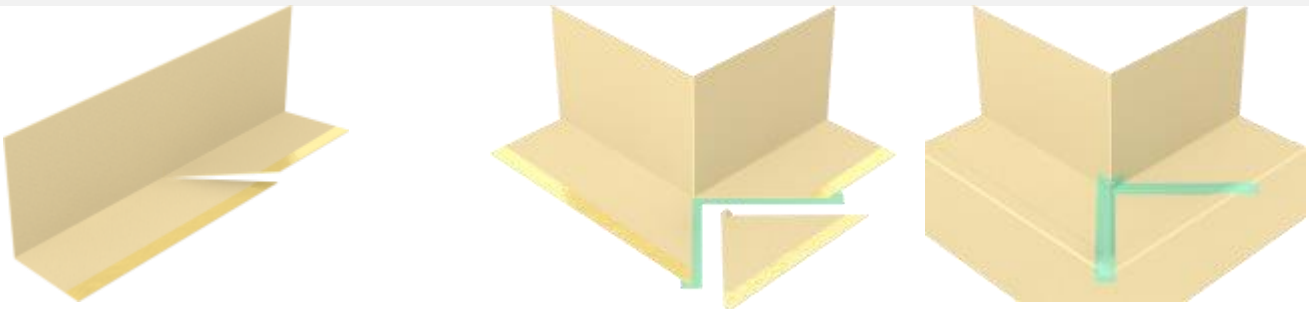
C) Cut, fold and bond the corner piece made from the **SikaProof® A** sheet on a clean working table as shown in the images below, for more detailed instructions please refer to the Application Manual.

D) Finally, when all of the adjoining membrane sheets are fixed, bond the **SikaProof® Tape-150 A** internally on top of all of the overlap joints with a minimum of 50 mm overlap on each side.



Forming the internal corners

Forming the external corners



3. Installation of the SikaProof® A membrane sheets

The **SikaProof® A** membrane sheet rolls in 1.0 or 2.0 m widths can be easily rolled out in position.

The next membrane sheet can simply be overlapped and bonded lengthways with the integral **self-adhesive strip** or transversely at the ends and cut ends of the rolls with the detailing tapes **SikaProof® ExTape-150** and **SikaProof® Tape-150 A**.

For the most efficient arrangement of the membrane sheets we recommend predominantly using the 2.0 m wide rolls and optimizing the membrane layout to obtain:

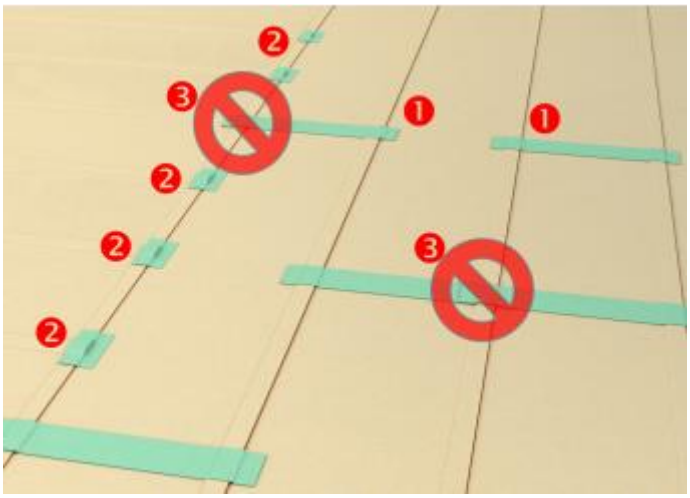
- Fewer overlap-joints
- Lower overall materials consumption (lower costs)

Use the integral self-adhesive strip on the membrane as much as possible for:

- Fewer detail joints with fewer detailing tapes
- Faster and easier installation

Important note:

Crossing-joints – «X-joints» must be avoided by staggering them! Only "T-joints" should be used.

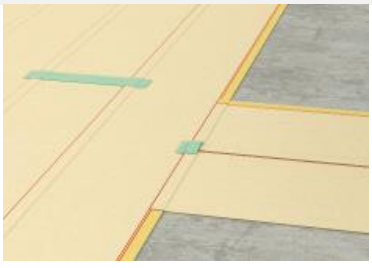


1. T-joints, using self-adhesive strip and detailing tapes
2. T-joints, using self-adhesive strip
3. X-joints, not allowed

3a) Sealing and bonding of T-joints

Two different types of T-joints are used:

- With self-adhesive strips only
- Where the self-adhesive strip meets a transverse joint

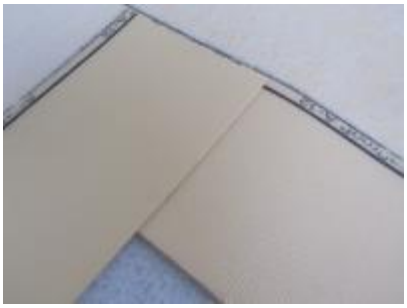


There are two version of SikaProof self-adhesive strips available.

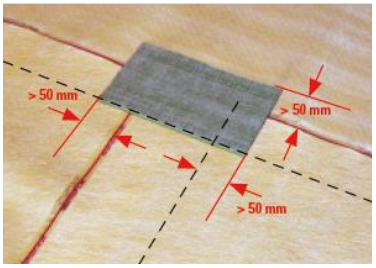
Previous version, still available.

The adhesive free edge of the top membrane sheet has to be cut off, 2-3 mm into the adhesive strip.

New version, flush cut edge.



No cut off to do.



Finally bond a single patch of **SikaProof® Tape-150 A** over the top of the T-joint (with minimum 50 mm overlap on all sides)

3b) Sealing and bonding of transverse joints

At the end of each membrane sheet or edge sheet the next sheet has to be connected with the detailing tapes:

- Internally **SikaProof® Tape-150 A**
- Externally **SikaProof® ExTape-150**

Only with the previous version, see above, the adhesive free edge of the lower membrane sheet is cut off.

Bond one half of the **SikaProof® ExTape-150** externally and overlap the next sheet min. 50 mm.

Finally bond the **SikaProof® Tape-150 A** over the top of the joint (min. 50 mm overlap on all sides)

3c) Installation on horizontal base slabs

Position the membrane roll to the adjoining sheets.

Adjust the sheets and release the liner of the self-adhesive strip and bond the overlaps.

Finally use a wide pressure roller for the most efficient and secure sealing and bonding.

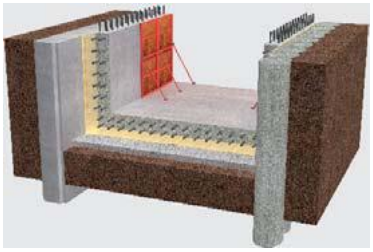
3d) Installation on vertical wall sections

SikaProof® A membrane can be applied on to single- or double-faced formworks:

Important Note:

Always follow the **"umbrella principle"**, which means making sure that **all of the overlap joints are facing downwards.**

- **Single-faced formwork:**
  1. Prepare the substrate on the retaining wall (permanent formwork)
  2. Install a separation/protection layer
  3. Apply **SikaProof® A** membrane in the vertical or horizontal directions to the wall.

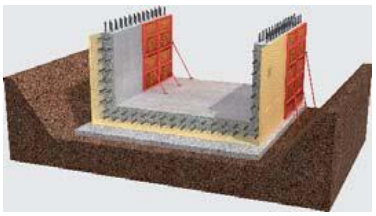


Important note:

Use a separation/protection layer between the retaining wall and the **SikaProof® A** membrane to protect the membrane from damage due to settlement or frictions from the ground. This is achieved using either:

- Plastic foil/film
- Geotextile
- Thermal insulation
- Alternatively see Section 7 E) "Backfilling Work"

- **Double-faced formwork:**
  1. Prepare the formwork.
  2. Apply **SikaProof® A** membrane in the vertical or horizontal directions to the wall.
  3. After the concrete has hardened, remove carefully the formwork (subject to the specified stripping time).
  4. Seal all open penetrations, such as shuttering anchors, and joints with **SikaProof® Patch-200 B** or **Sikadur® Combiflex SG** system, see Section 6.4.



Important Note:

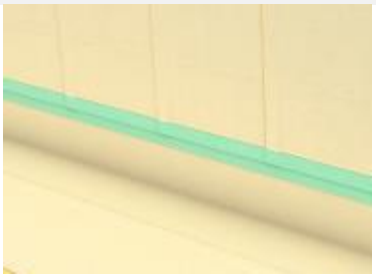
Do not use **SikaProof® A-08/-12 Edge** sheets with double-faced formwork, because their "umbrella sealing principle" is not fulfilled. Because any physical damage during installation or during the service life could adversely affect the adhesion/bond of the overlap.

If still edge sheets are used an additional **SikaProof® ExTape-150** is recommended to close the (upwards open) overlap joint externally.

Sheets applied in vertical directions

Connection of slabs to walls using standard **SikaProof® A** membranes:

1. Cut the overlaps of the vertical membrane sheets in a straight line with a minimum overlap of 50 mm.
2. Seal and bond the horizontal overlaps with the detailing tapes, using an external **SikaProof® ExTape-150** and an internal **SikaProof® Tape-150 A.**
3. Seal and bond the overlaps between the subsequent vertical sheets with their prefabricated self-adhesive strips.



Place the membrane sheet and adjust it to position using the two red installation marks.

Fix the membrane sheets on the top and on the free membrane edge lengthways.

Release the liner of the self-adhesive strip and bond it by using a pressure roller firmly.

Sheets applied in horizontal directions

Connections of slabs to walls using standard **SikaProof® A** membranes:

1. The subsequent sheets have to be installed with their self-adhesive strip downwards in order to overlap the lower sheet externally, to respect and follow the “umbrella principle”.
2. Transvers joints between the sheets should be sealed and bonded as outlined above.

To follow the “umbrella principle”: First place a 2.0m wide sheet vertically, 400 mm above the floor level.

Than connect another 2.0 m wide sheet in the horizontal area fold the end vertically and bond to the vertical sheet.

Note:
Prevent any folds caused by sagging membranes during installation (by adequate fixing).

3e) Fastening terminations in vertical areas

There are several methods to fix the **SikaProof® A** membrane onto vertical areas including:

- Staple guns
- Nailing onto plastic or metal sheets
- With dowels into insulation boards
- Using double-sided adhesive tapes

Where to fix the membrane?

- Use the free membrane edge of the self-adhesive strip
- Use the external edge of the **SikaProof® ExTape-150**
- Use the external areas of the membranes, e.g. top ends of the sheets or overlaps

Important note:

It is essential to have quick and uniform fixing for fastening the membrane in vertical areas, so that the membranes remain firmly fixed in position during the reinforcement and concrete work.

Any penetrations or damage to the membrane must be sealed with an overlap of the next membrane sheet or must be sealed with **SikaProof® Tape-150 A**.

4.	**Installing standard details**	See Section 6.4
5.	**Post membrane installation sealing requirements** (external penetrations, joints and connections)	See Section 6.4

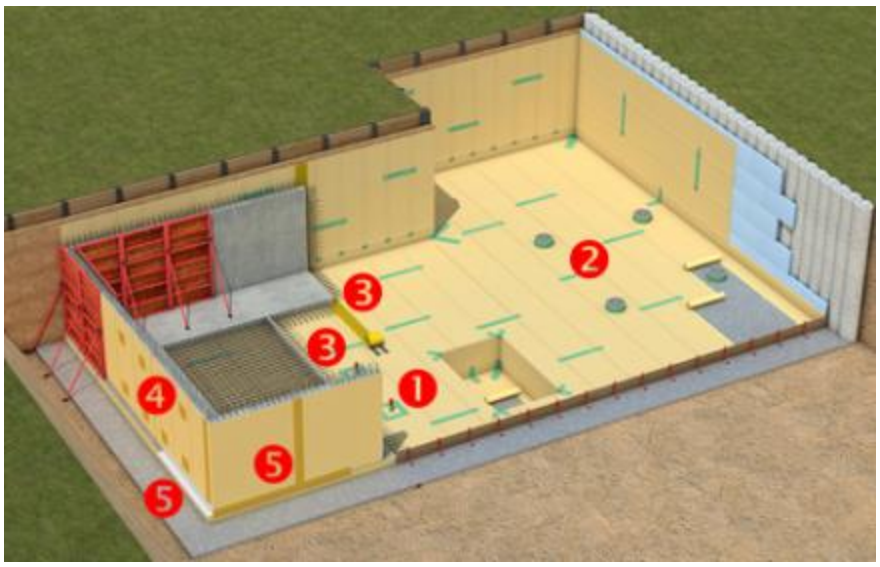
6.4 STANDARD DETAILS

This section shows how to create and install standard details for the SikaProof® A membrane system using the specially designed SikaProof® A accessories. For more detailed instructions on how to form and install these detailing solutions please see also refer to the SikaProof® A system Application Manual and Product Data Sheet.

For further detailing solutions please contact your local Sika Technical Services Department.

The following standard SikaProof® A system details have been tested and approved by the functional testing to German National and EN Standard at Wissbau, Germany, including:

- Penetrations details, such as pipe penetrations and shuttering anchors, test report No. 2010-212-6
- Post sealing details, with Sikadur® Combiflex SG, test report No. 2010-212
- Pile cap details, test report No. 2010-212-7



1. Pipe penetrations
2. Pile caps
3. Joint Sealing (pre-installed)
4. Tie-bar holes
5. External joint sealing (post-installed)
6. Further details

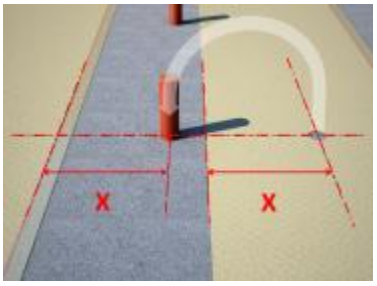
1. Pipe penetrations

This standard detail for pipe penetrations can also be used for similar penetrations such as other inlets or small pits / shafts etc.

There are two alternative options of how to install this detail, for more detailed information please refer to the **SikaProof® A** Application Manual.

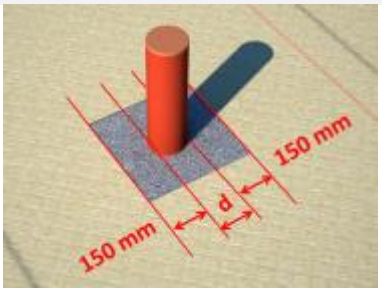
Option A:

1. Lay out the **SikaProof® A** membrane sheet next to the pipe penetration.
2. Measure and mark the exact position of the pipe.
3. Cut out a hole with a diameter 20-40 mm smaller than the pipe diameter.
4. Seal the vertical pipe part with **SikaProof® Tape-150 A** around the pipe (overlap of the tape minimum 20 mm and also overlapping on the membrane collar minimum 20 mm.



Option B:

1. Cut a pipe sized cross in the membrane sheet and lay it out.
2. Cut out a square of membrane to go over the pipe, minimum size to the pipe diameter plus 150 mm on each side (i.e. pipe Ø +300 mm).
3. Bond **SikaProof® ExTape-150** externally on the bottom (membrane side) around the square.
4. Cut an extra square piece to position over the pipe minimum 50 mm larger on each side than the first square.
5. Cut out the hole with a diameter 20-40 mm smaller than the pipe diameter.



Note:

To achieve this, there must also be an optimum membrane collar of minimum 20 mm fitted vertically around the pipe.

6. Pull the extra square piece over the pipe and fit it correctly.
7. Bond the square piece to the **SikaProof® ExTape-150** on the bottom.
8. Bond the **SikaProof® Tape-150 A** to the top over all of the overlapping joints minimum tape overlap 50 mm.

9. Finally seal the pipe vertically with the **SikaProof® Tape-150 A** around the pipe (overlap of the tape minimum 20 mm) and also overlapping on the membrane collar minimum 20 mm.

Important note:

The pipe surface has to be appropriately prepared and pre-treated before bonding the **SikaProof® Tape-150 A** to seal around it.

- Ensure that the pipe surface is clean, dry and free from any materials (oils, grease, dust, dirt etc.) that could impair adhesion.

In addition the following preparation is required:

- PE based pipes: pre-treat with an open flame gun
- PVC based pipes: pre-treat by abrading the surface with sandpaper
- For other penetrating material in direct contact (such as any synthetics etc.) the compatibility and appropriate pre-treatment should be confirmed.

Additional waterproofing options:

As an additional barrier or security the use of **SikaSwell® S-2 sealant** or **A profiles** around and between the pipe or other penetrations within the concrete element is recommended.

2. Joint sealing (pre-installed)

Any designed joints or connections in or from the structure must be sealed additionally by complementary Sika® Waterproofing Joint Solution Systems, dependent on the project requirements.

Water could easily enter structure through all types of joints, gaps, voids, cracks or honeycombing where the membrane is not fully bonded to the reinforced concrete. Therefore all of the joints, gaps and voids must be pre-sealed with:

- **SikaSwell® A / SikaSwell® S-2 / SikaSwell® rings**
- **Sika® Waterbars / Waterstops**
- **SikaFuko®** injection hoses

2a) Construction joints (pre-installed)

Additionally always use **SikaSwell® A profiles** as the minimum for pre-sealing construction joints, and for higher performance requirements use **SikaFuko®** injection hoses.

The use of **Sika® Waterbars** is also possible, dependent on the project requirements and the method of construction.

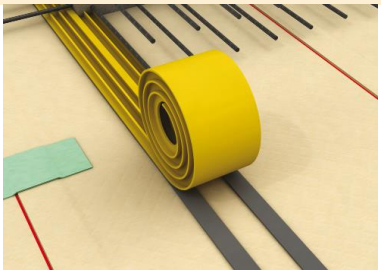
Important Note:

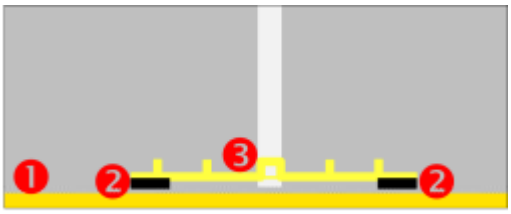
Always consider and check that connections, terminations and joint sealing systems are correct and refer to current Method Statements.

2b) Expansion joints (pre-installed)

For the secure sealing of expansion joints it essential to use external **Sika® Waterbars** for the additional pre-sealing and optimum movement accommodation. Therefore normal watertight construction and joint dimensioning is required.

For further information regarding design and dimension of expansion joints please refer to the Method Statements for Sika's engineered joint waterproofing and sealing solutions.





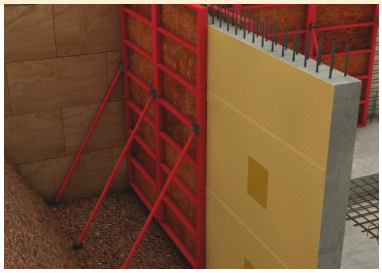
❶ **SikaProof® A** membrane
❷ **SikaProof® FixTape-50t**
❸ **Sika® Waterbar** external

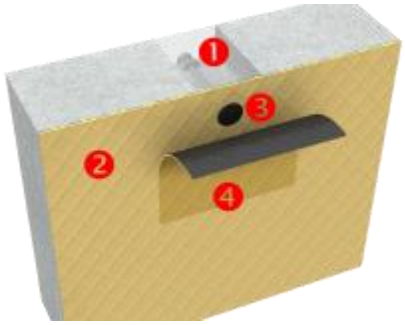
General procedure, how to install waterbars:

1. First measure and mark the position.
2. Fix and bond the **Sika® Waterbar** by using a strip of **SikaProof® FixTape-50** onto each side.
3. Additionally bond a strip of **SikaProof® FixTape-50** across each 1-3 m to create a kind of compartments.

3. Formwork tie-bar holes (post-installed)

After removing double-faced formwork the tie-bar holes and any open penetrations must be sealed either with **SikaProof® Patch-200 B** or alternatively with the **Sikadur® Combiflex SG** system.



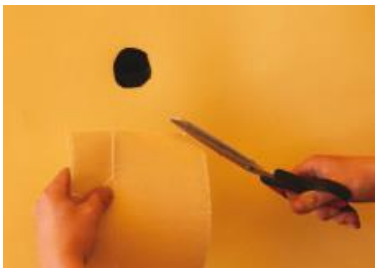


❶ Tie plug
❷ **SikaProof® A** membrane
❸ **SikaProof® FixTape-50**
❹ **SikaProof® Patch-200 B**

General procedure:

1. Close the tie-bar holes with appropriate plugs or mortar.
2. Clean the membrane surface around the penetration.

   Important note: for the adhesion of Sikadur® Combiflex SG system, surface pre-treatment is essential by running over briefly crosswise with an open torch!
3. Level and smooth the edges around the tie plugs with a piece of **SikaProof® FixTape-50.**
4. Cut a suitably sized piece of **SikaProof® Patch-200 B** and round the corners.
5. Position the patch centred over the penetration (minimum 50 mm on each side) and bond it on to the **SikaProof® A** membrane.
6. Finally use a pressure roller for secure sealing and bonding (ensure there are no trapped air bubbles).



4. External joint sealing (post-installed)

All joints must be sealed by complementary Sika® Waterproofing Systems, dependent on the project requirements. See Section 3. above.

To seal external joints and connections use

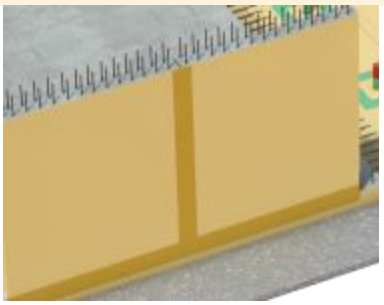
- **SikaProof® Patch-200 B**
- **Sikadur® Combiflex SG** system

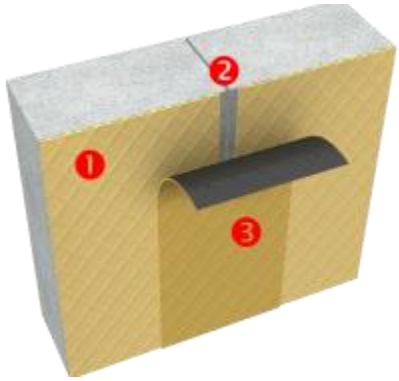
4a) Construction joints (post-installed)

Construction joints without any structural or dynamic use, can easily be sealed using **SikaProof® Patch-200 B.**

For any other construction joint, especially for precast concrete elements and connections to existing structures it is recommended to use **Sikadur® Combiflex SG** system.

For joints of precast concrete elements see next Section 5b).





❶ **SikaProof® A** membrane
❷ Joint filling/sealing **Sikaflex®**
❸ **SikaProof® Patch-200 B**

General procedure:

1. First clean the surfaces along the joint.
2. Fill any gaps or voids to level the surface (e.g. with **Sikaflex®** or **SikaProof® FixTape-50**).
3. Bond **SikaProof® Patch-200 B** cantered over the joint and onto the **SikaProof® A** membrane with a minimum overlap of 80 mm on both side.
4. Finally use a pressure roller firmly to securely seal and bond the tapes / patches (ensuring that there are no air bubbles).

4b) Joint sealing of precast concrete elements

The use of **SikaProof® A** with precast concrete elements needs special attention including:

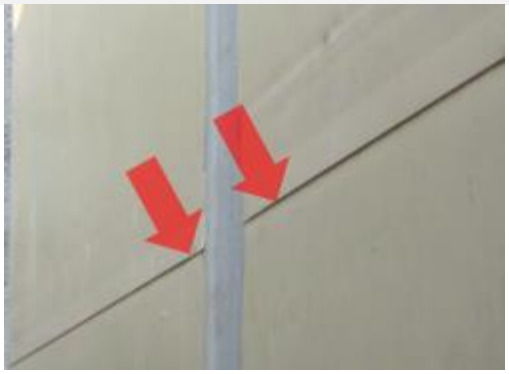
- Waterproofing design of the precast structure / system
- Design of the precast concrete elements (concrete edge, element thickness)
- Layout of SikaProof® A membrane joints
- Workmanship and standard of finish on precast elements
- Precast element transport and installation method
- Post sealing the construction joints between precast elements

All joints and connections between precast elements must be sealed with complementary Sika joint sealing systems according to the project requirements.

- **SikaSwell® A / SikaSwell® S-2 / SikaSwell®** rings
- **Sika® Waterbars / Waterstops**
- **SikaFuko®** injection hoses

Additionally always use **SikaSwell® A** profiles or **SikaSwell® S-2** as the minimum for pre-sealing construction joints.

a) Layout of SikaProof® A membrane joints



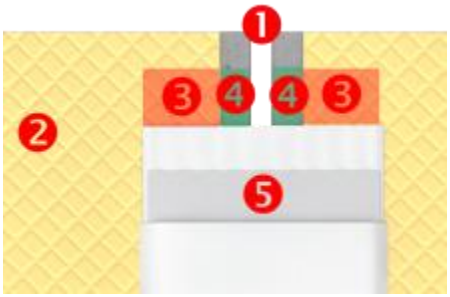
Important note:

- Respect the “umbrella principal”, that means all overlap joints in the final layer of the **SikaProof® A** system have to be orientated downwards or possibly sideways (on some vertical surfaces).
- Cut off all adhesive free edges of the membrane sheets next to the concrete element edges, equally to the procedure for the T-joints, see Section 3a).

b) Layout of precast elements joints

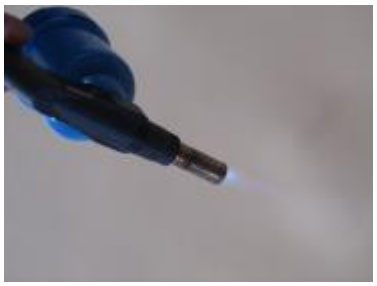
The following aspects have to be fulfilled for a watertight joint sealing with **Sikadur® Combiflex SG** system and **SikaProof® A** membrane system.

- Thickness of the outside pre cast plate
- Concrete edge, without SikaProof® A membrane
- Minimal adhesion surface/width onto the **SikaProof® A** membrane, see guide below.



❶ Concrete edge of precast element
❷ **SikaProof® A** membrane
❸ Minimal adhesion surface on membrane
❹ Minimal adhesion surface on concrete
❺ **Sikadur® Combiflex SG** system

General procedure:



1. Pre-treat the concrete surface of the edge mechanically
2. Clean the membrane surface.
3. **Pre-treat the bonding membrane surface by running over briefly over crosswise with an open torch.**
4. Apply the **Sikadur® Combiflex SG** system, according to the current Method Statement.

Important note:

For detailed information of the installation procedure please refer to the current Method Statement of **Sikadur® Combiflex SG** system.

For construction joints (no load or dynamic movement stress) with **Sikadur® Combiflex SG** system. Tape dimensions & minimum overlaps / boding surface must be used:

	Damp proofing No water pressure	Waterproofing	
		Water pressure ≤ 10 m (≤ 1.0 bar)	Water pressure ≥ 10 m (≥ 1.0 bar)
Minimum tape thickness	≥ 1 mm	≥ 1 mm	n.a.
Total adhesion surface/wide	**≥ 50 mm**	**≥ 100 mm**	**n.a.**
- On concrete edge*	**≥ 0 mm**	**≥ 40 mm**	**n.a.**
- On membrane**	**≥ 50 mm**	**≥ 60 mm**	**n.a.**
Bonded width of the concrete edge of the precast element	0 - 20 mm	50 - 70 mm	n.a.
Minimum thickness of precast element***	≥ 60 mm	≥ 80 mm	n.a.

***** Concrete treatment according to method statement of **Sikadur® Combiflex SG** system.

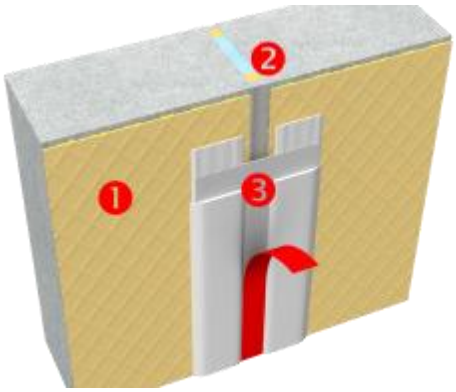
****** The bonding surface of the **SikaProof® A** membrane has to be

- Fully bonded to the precast concrete element
- Pre-treated by running over briefly crosswise with an open torch

*** Due to no water migration and the full bond a minimal concrete thickness is essential.

4c) Expansion joints (post-installed)

For any joints under with anticipated movement the use of **Sikadur®-Combiflex SG** joint sealing system is recommended. **SikaProof® Patch-200 B** is not suitable for these applications. For optimum joint movement capacity the right **Sikadur®-Combiflex SG** type has to be selected and detailed. For further information please refer to the current Method Statement of **Sikadur®-Combiflex SG** system.



❶ **SikaProof® A** membrane
❷ Joint filling / sealing **Sikaflex®**
❸ **Sikadur®-Combiflex SG** system

General procedure:

1. Pre-treat the concrete surface of the edge mechanically
2. Clean the membrane surface.
3. **Pre-treat the bonding membrane surface by running over briefly over crosswise with an open torch.**
4. Apply the **Sikadur® Combiflex SG** system, according to the current Method Statement.

Important note:

- For more detailed information of the installation procedure refer to the current Method Statement.
- Make sure that the central expansion part of the **Sikadur®-Combiflex SG tape** with the red masking tape, is free of adhesive for optimal movement capacity.

For expansion joints with **Sikadur® Combiflex SG** system.
Tape dimensions & minimum overlap widths / bonding surfaces must be used:

	Damp proofing No water pressure	Waterproofing	
		Water pressure ≤ 10 m (≤ 1.0 bar)	Water pressure ≥ 10 m (≥ 1.0 bar)
Minimum tape thickness	≥ 2 mm	≥ 2 mm	n.a.
Total adhesion surface/wide	**≥ 80 mm**	**≥ 125 mm**	**n.a.**
- On concrete edge*	**≥ 0 mm**	**≥ 65 mm**	**n.a.**
- On membrane**	**≥ 80 mm**	**≥ 60 mm**	**n.a.**
Bonded width of the concrete edge of the precast element	0 - 20 mm	≥ 65 mm	n.a.

***** Concrete treatment according to method statement of **Sikadur® Combiflex SG** system.
****** The bonding surface of the **SikaProof® A** membrane has to be

- Fully bonded to the precast concrete element
- Pre-treated by running over briefly crosswise with an open torch

For the dimension of the movement width of the tape please refer to the current Method Statement

5. Further detailing solutions

For additional advice and how to execute any further detailing solutions, please refer to your local Sika Technical Services.

Subsequent penetrations or recesses

To seal subsequent pipe penetrations and other connections, we generally recommend the use of the **Sikadur® Combiflex SG** system.

For further information please refer to the current Method Statement for the **Sikadur® Combiflex SG** system or contact your local Sika Technical Services.

6.5 PROTECTION, CLEANING & REPAIR

Basically it should always be a clear goal to prevent any damages and soiling on the installed **SikaProof® A** membrane system for further cleaning or repair works to be necessary.

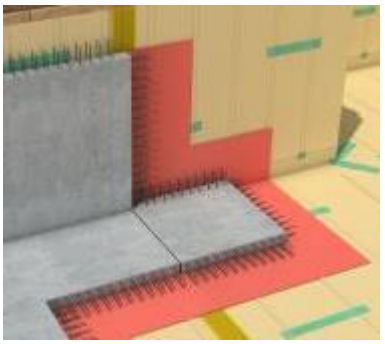
A) Protection

The installed **SikaProof® A** membrane system has to be protected **temporarily** in order to:

- prevent soiling from other work or weather on site
- prevent any damages that could be caused during installation of steel reinforcement or other trades
- protect the membrane from weathering (e.g. UV exposure)

Every membrane protection layer is temporary!

Due to the fully bonded nature and functionality of the **SikaProof® A** system, it must be in direct contact with the reinforced concrete of the main structure being waterproofed. Any other layers (e.g. any excess materials, release liners, protective films, protective mortar etc.) will all prevent this full bond if not completely removed before the concrete is placed.



Protect the **SikaProof® A** membrane when concreting adjacent area, connecting areas or when it has be exposed for a longer period with:

- plastic film/foil (UV resistant)
- geotextile (UV resistant)
- or other equivalents

Note:

If any reinforcement or any other materials have to be stored temporarily on the membranes, always use some protection such as plywood sheets to prevent any damage to the membrane!

B) Cleaning

When to clean the membrane system?

If the **SikaProof® A** membrane is dirty or soiled
it has to be cleaned to ensure a full bond to the concrete.

Remove all and any:

- Liners, cut-off membrane pieces, waste materials
- Debris, dirt, dust, soil, sand, concrete/ cement splashes
- Anything that could create a debonding/ separation layer

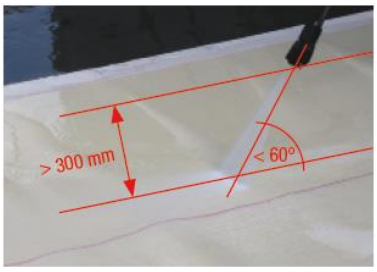
How to clean the membrane?

Clean the SikaProof® A membrane surface
with compressed air or controlled pressure water jetting.

Important notes:

For high-pressure water jetting:

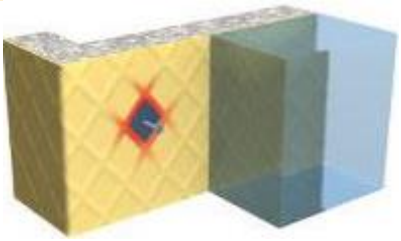
- Maximum pressure < 200 bar
- Flat nozzles – no spirals!
- Minimum distance between the membrane surface and the jet nozzle > 300 mm
- Do not point the nozzle directly at overlap joints
- Optimum angle for the jet < 60° (no 90°)
- Always do initial testing on a spare piece of membrane with any proposed high pressure water cleaning equipment, also use a spare piece of membrane to make the appropriate equipment set up and adjustments without causing damage!
- Finally remove any standing water from the formwork and membrane surfaces.



C) Repair work during the installation

How to repair any membrane damage?

Any damage of the **SikaProof® A** membrane
system must be repaired to achieve a tight waterproofing system, despite the fact that the full bond prevents any lateral water migration. This ensures that the **SikaProof® A** system creates and remains durable, watertight and protective waterproofing system.



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

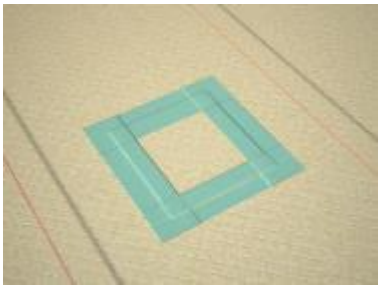
Repairs during the installation	
Insufficient/incorrect bond of overlaps:	Membrane damage:
Self-adhesive strip with low overlap ► Use an additional **SikaProof® Tape-150 A**	Membrane cuts or damage less than d≤ 10 mm ► Seal & bond using **SikaProof® Tape-150 A** according to Method A, see below
Self-adhesive strip with too much overlap and no red lines visible ► Cut off the membrane overlap	Any membrane damage ► Seal & bond according to Method B, see below
Self-adhesive strip with no adhesion ► Use the detailing tapes to create a standard detail joint. ► Cover the entire self-adhesive strip area without adhesion using **SikaProof® Tape-150 A** (fully bonded)	

Method A:

- Small cuts / holes are sealed with a patch of **SikaProof® Tape-150 A** minimum overlap on each side 50 mm).
- Press the tape firmly into the fleece using a pressure roller.

Method B:

- For larger areas of damage, cuts etc. must be sealed with additional pieces of **SikaProof® A** membrane and external and internal detailing tapes a similar way to the pipe penetration sealing method above (except the hole!).

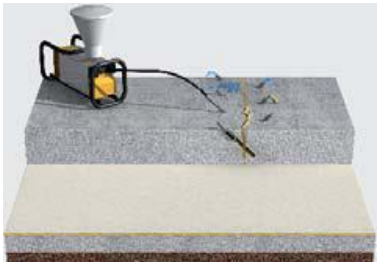


Repair after installation (only for double-sided formwork)		
Insufficient/incorrect bond of overlaps:	Membrane damage:	De-bonding, insufficient concrete bond:
Slight delamination, adhesion still ≥ 60 mm ► Clean the overlap Use an additional **SikaProof® ExTape-150**	Small areas of membrane damages less than d≤ 30 mm ► Seal & bond it using **SikaProof® Patch-200 B**	Small areas of de-bonding, bubbles less than d≤ 100 mm with intact membrane ► No damage, no repair!
Delamination of overlap joint ► Clean the overlap Seal & bond it again with an additional **SikaProof® Patch-200 B**	Any membrane damage ► Seal & bond it using **SikaProof® Patch-200 B** ► For larger areas seal with **Sikadur® Combiflex SG system**	Any de-bonding, bubbles less 1.0 sqm with/without intact membrane ► Inject the bubble (only by two small holes, these can be sealed afterwards with **SikaProof® Patch-200 B** ► Remove the membrane and reseal the area with **Sikadur® Combiflex SG system**
		Any de-bonding, with bubbles larger than 1.0 sqm ► Special solution required

D) Repair during service life

If any damage occurs throughout the service life, the damage is locally limited due to the full bond of the **SikaProof® A** membrane system preventing any lateral water underflow or migration.

- Additional sealing or resealing of any joints is essential to prevent any uncontrolled leakage through any construction, movement or connection joints.
- Any local 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.



7 ACCOMPANYING TRADES

Successful waterproofing with the **SikaProof® A** membrane system depends on its full bond to the reinforced concrete of the main structure. This fully bonded requirement and functionality can also be affected by the main contractors and other trades who are out of the control of the waterproofing contractor.

Therefore it's important to take the following points into consideration in the early design and planning stages of the project:

- Excavation
- Formwork / shuttering work
- Reinforcement work
- Concrete work
- Backfilling work
- Other work

The specific working steps required depending on the specific local construction requirements and methods. Here are some of the general aspects which have to be taken into consideration:

A) Excavation Work / Substrate Preparation

These can very significantly affect the installation including:

- The excavation method and type of retaining wall (e.g. method of tie-back for the wall)
- Dewatering systems (e.g. temporary pipe penetrations needed)
- Substrate requirements (e.g. drilled pile or diaphragm walls have rough and uneven surfaces)
- Connection of the different construction elements (e.g. the pile or the diaphragm wall to the base slab)

Tie-back (anchoring) of the retaining wall: Not a uniform and continuous substrate, or requires a temporary recess for tie-back.

Dewatering system with temporary pipe penetrations.

Piled retaining wall with anchors: The uneven substrate with additional levelling/facing concrete/mortar.

B) Formwork / Shuttering Work

The formwork has to be suitably designed to fulfil all of the requirements for the concrete substrate, as described above in Section 6.1.

The following points have to be respected:

- Do not use any release agents on the formwork, as these will leave residues that can prevent or reduce the bond to the **SikaProof® A** system to the concrete.
- Early stripping (before the concrete is sufficiently hardened) could result in peel of the membrane (see picture)
- **Respect the local stripping period,** e.g. DIN standard 1045- part 3 (minimal concrete strength ≥ 10 N/mm^2)
- Remove the formwork carefully

Pay careful attention to the shuttering and slabs between concrete stages to prevent any membrane punctures/damage!

Reuse the existing tie-bar penetrations in the structure to fix the next shuttering stages.

Formwork need to be prepared for continuous proper membrane placing and installation.

C) Reinforcement Work

Unlike other membrane waterproofing systems, **no additional protection layers, such as screeds**, is required for the **SikaProof® A** membrane system.

The **SikaProof® A** membranes have to bond to the reinforced concrete surface of the structure.

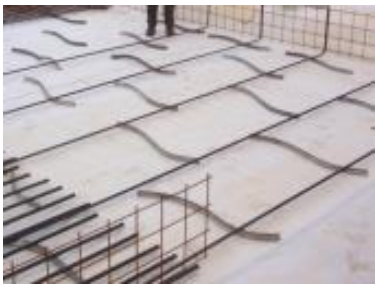
To ensure full and easy flow of the concrete slurry around the spacers and into the membrane fleece to embed it, always:

- Use curved spacer surfaces rather than flat
- Position and fix the spacers offset, not in lines
- Use single or linear spacers

Due to the fully bonded requirements, the steel reinforcement has to be fixed carefully on the membrane using appropriate chairs or spacers.

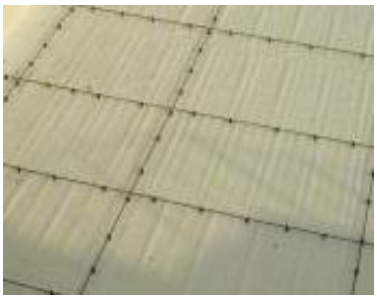
Important Notes:

- Prevent any reinforcement being stored on the membranes, if this is unavoidable during the steel fixing works then use plywood or similar to protect the membrane from damage.
- If the membrane is damaged, it has to be repaired with a patch of **SikaProof® Tape-150 A**, see Section 6.5 “Protection, Cleaning & Repair”.



Recommended cement mortar spacers with waved surfaces used for fair faced concrete.

Use single spacers, standard products, that are stable and without sharp edges.



Create an inital mesh framework of reinforcing steel to install the rest on to.

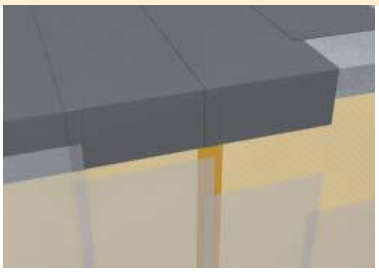
D) Concrete Work

The concrete quality (see Section 3.3) and workmanship are also key factors for successful waterproofing with a permanent and full bond of the **SikaProof® A** membrane system to the reinforced concrete structure preventing any water lateral migration/underflow.

The following aspects of workmanship are particularly important:

- Inspect the **SikaProof® A** system before the concrete work to: (see Section 8 “Inspection, Quality Control”)
  - identify any damages
  - remove any excess materials, waste etc.
  - remove any ponding water or any ice or snow
- Pour in the concrete carefully, especially into the walls (taking care not to tear the membrane, especially at the overlap joints)
- Proceed accordingly to standard good concrete practise
- Take special care of the vibration and compaction (to prevent any membrane contact/damage and no honeycombing)
- Protect adjacent membrane connection areas from concrete splashes

E) Backfilling Work



As with all membrane waterproofing systems **SikaProof® A** membrane must be protected against any damage

- from the backfill material
- caused of settlement/friction from the soil (separation layer)

The protection layer has to withstand the following:

- The fill particle diameter/shape
- The nature of the fill/soil
- The method of compaction

The following ancillary products are available to protect the membrane:

- **Sikaplan® WT Protection sheet**
- **Sikaplan® W Tundrain**
- **Sikaplan® W Felts**
- Other geotextiles > 500 g/m^2
- Other insulation boards > 20 mm

F) Other Works

During and after the installation of the **SikaProof® A** membrane system there are no other trades or any heavy equipment (see picture) allowed onto the installation area of the membrane 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.

8 INSPECTION, QUALITY CONTROL

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

A) Before the installation

Before the installation begins the substrate has to be inspected and confirmed as being ready for the installation.

The substrate must meet the following requirements:

- The substrate has to be stable to avoid movements
- Smooth, uniform and clean to prevent membrane damage
- Gaps and voids (> 12-15 mm) have to be filled and closed before the installation
- Preferably a dry substrate, or damp or slightly wet, but with no standing water
- Substrate temperature minimum +5°C

B) After the installation of SikaProof® A

When installation is completed, quality control checks of 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. Because all of following trades and the main contractor that potentially have to work on the **SikaProof® A** membrane, are out of 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
- Finally remove all release liners, all excess materials and waste (such as release liners) and any other debris from installation of the membrane system

C) Before the concrete is placed

When the reinforcement is installed and before the concrete is placed the **SikaProof® A** membrane system has to be inspected finally to ensure a successful fully bonded waterproofing system.

Checklist for final inspection:

- Check if any membrane damage such as cuts or holes that occurred from the reinforcement work have been repaired
- Finally remove any excess membrane and any other waste, plus any dirt, debris and standing water
- Essentially remove anything that could prevent the system fully bonding to the concrete structure, such as any temporary protection layers.

D) After the removing of the formwork

Respect the stripping period according to the local standard and the minimum concrete strength ≥ 10 N/mm^2. (See Section 7B)

After removing the formwork

- check the external membrane side of **SikaProof® A** system, e.g. if there are any damages.
- repair any damage according to the procedure, (see Section 6.5 C).

9 EQUIPMENT, TOOLS

SikaProof® A membrane system is no welded, it is an easy, fast and secure system that is simply bonded. For a correct and safe installation the following simple 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

- Additional telescopic roller handle and lager pressure roller for easier, secure bonding of all overlap joints.

- Carrying handles for easier carrying of rolls by two people.

10 CERTIFICATES & APPROVALS

Fully bonded sheet membrane waterproofing systems for basements, such as SikaProof® A, 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 the fully bonded performance. This includes:

Europe

- Product Declaration EN 13967 – Flexible sheets for waterproofing
  CE Certificate No. 1349-CPD-065, 16.08.2011
- German function tests, test institute Wissbau Beratende Ing.-GmbH
  - Function **test report No. 2010-212** for SikaProof® A-08, 03.05.2011
  - Function **test report No. 2010-212-6** for penetrations, 25.11.2011
  - Function **test report No. 2012-212-7** for pile head, 25.11.2011
- German abP (allgemeines bauaufsichtliches Prüfzeugnis), tested with SikaProof® A-08, Material Test Institute MPA NRW approval **abP No. P-22-MPA NRW-8600**, 26.05.2011
- German abP, "Bauartenzulassung" according DIN 20000-202 standard, Material Test Institute MPA NRW:
  - Tested with SikaProof® A-08, approval **abP No. P-22-MPANRW-8945-1**, 08.08.2013
  - Tested with SikaProof® A-12 approval **abP No. P-22-MPANRW-8945-2**, 08.08.2013
- BBA, British Board of Agrément technical approval for construction, **Agrément Certificate 13/5075**, 16.12.2013
- Cahier des Charges, French approval CCT 57 by Enquête de Technique Nouvelle Socotec **No. EAD9247/2**, 31.12.2013
- Radon permeability, Slovak Medical University
  - For area of SikaProof® A-08, test report No. E-214/2011, 07.11.2011
  - For area of SikaProof® A-12, test report No. E-215/2011, 15.11.2011
  - For overlap joints with self-adhesive strip of SikaProof® A-08, test report No. E-225/2012, 12.03.2013
  - For overlap joints with detailing tapes of SikaProof® A-08, test report No. E-226/2012, 12.03.2013
- Root resistance according to CEN/TS 14416, test institute SKZ
  - For overlap joints with self-adhesive strip of SikaProof® A-08, test report No. 107615/13-I, 10.12.2013
  - For overlap joints with detailing tapes of SikaProof® A-08, test report No. 107615/13-II, 10.12.2013

North America

- Report of ASTM tests, Nelson Testing Laboratories, US
  - For SikaProof® A-12, test report No. 1240-13(A), 05.02.2014
  - For SikaProof® A-08, test report No. 1240-13(B), 05.02.2014
  - For SikaProof® A-05, test report No. 1240-13(C), 05.02.2014
- Function test according ASTM Test D 5385 modified, Sika MPL (internal material test lab) Zürich, test report No. 1202001, 07.12.2012

Asia, Pacific

- BRANZ, New Zealand technical approval for construction, approval No. 852 (2014), 05.02.2014

11 LEGAL NOTE

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. in practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the products suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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