



# SikaRoof® CONTROL – MONITORING LEAK DETECTION SYSTEMS

THE SMART FLAT ROOF

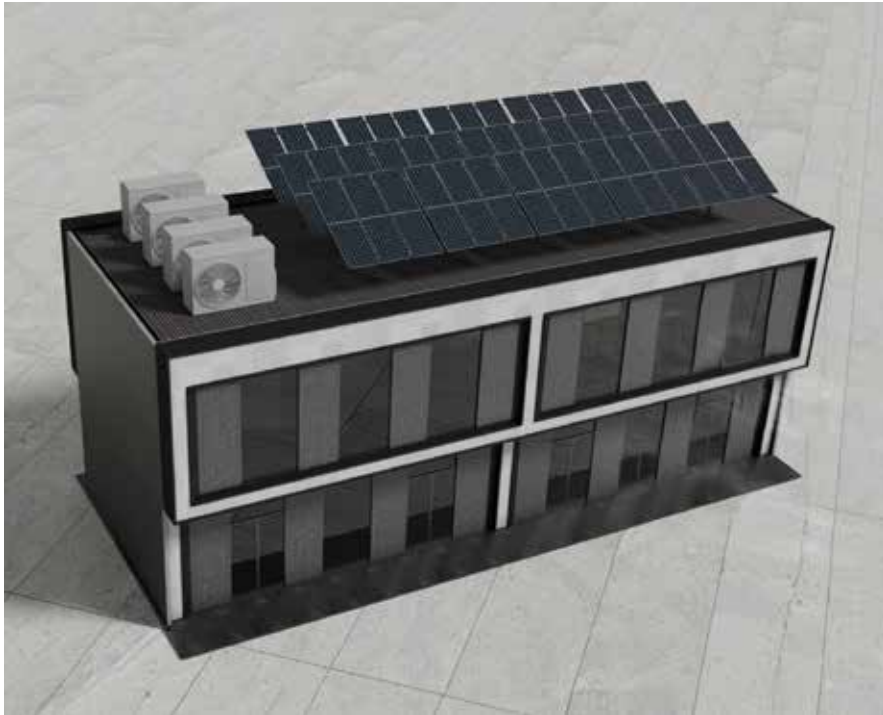
BUILDING TRUST



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# IMPACTS ON ROOF WATERPROOFING SYSTEMS



## EQUIPMENT

Photovoltaic and air conditioning



## VIBRATIONS AND MOVEMENTS

Engines, cold and warm contraction



## WIND

External and internal pressure



## FIRE



## CHEMICAL SUBSTANCES

NO<sub>2</sub> and SO<sub>2</sub>



## MAINTENANCE

Mechanical impacts / Foot traffic



## SUN

UV and high temperature



## RAIN



## HAIL

Mechanical impact with low temperature



## SNOW

Low temperature



## MICROORGANISMS

Bacteria, algae, fungi



**SikaRoof®**  
**Monitoring System**  
Stay Safe and Secure



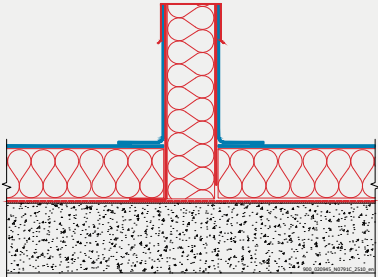
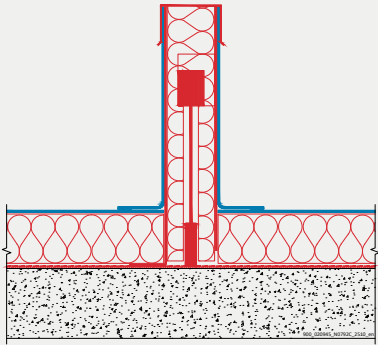
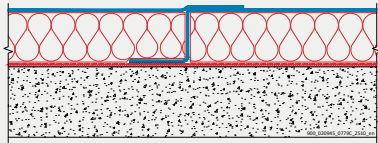
**SikaRoof®**  
**Monitoring System**  
The Smart Flat Roof



# SikaRoof® CONTROL SYSTEMS

## GENERAL SYSTEM INFORMATION / OVERVIEW

**ASPECTS SUCH AS SUSTAINABILITY AND ENERGY EFFICIENCY** are becoming increasingly important in today's world. This development is based on a holistic view of a building in its entire life cycle. SikaRoof® Control Monitoring Systems enables to inspect water ingress and detect / locate the defective area and helps to secure material assets and prevents consequential damages. The continuous monitoring of the building condition allows for a targeted and cost-effective maintenance. The SikaRoof® Control – Monitoring is designed as a modular system.

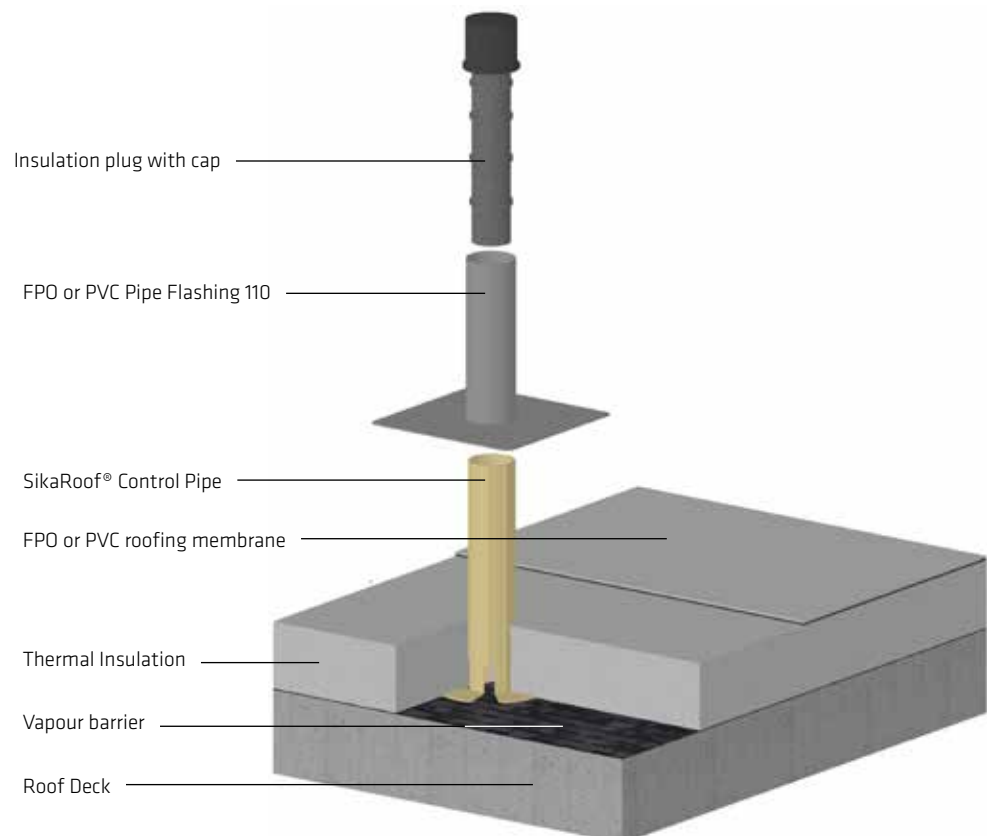
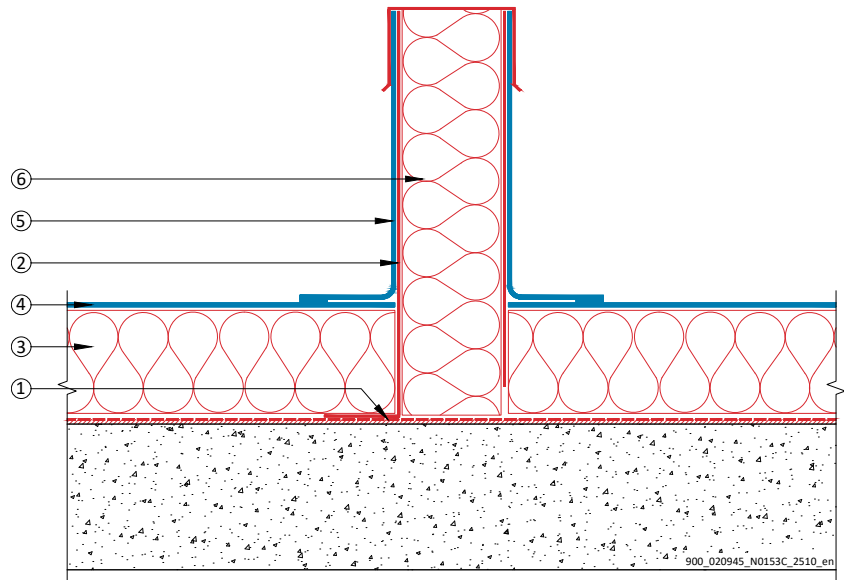
|                                                                                                                                                        | Detection of water on vapour barrier               | Limiting the area of water spread inside the roof build-up | SikaRoof® Control<br>Precise low or high voltage leak detection |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|
|  <p><b>Control Pipe for manual visual inspection possibility</b></p> | <p>✓<br/>(visual check / passive - point)</p>      |                                                            | Optional                                                        |
|  <p><b>Control Pipe with integrated 24/7 monitoring</b></p>         | <p>✓<br/>(monitoring / active - area ~ 300 m²)</p> |                                                            | Optional                                                        |
|  <p><b>Compartment / Waterstop System</b></p>                       |                                                    | <p>✓<br/>(area ~ 100-600 m²)</p>                           | Optional                                                        |

# SikaRoof® CONTROL

## ROOF CONTROL PIPE MANUAL – VISUAL INSPECTION POSSIBILITY

Enables inspecting any water ingress by visually inspecting the control pipe on the roof. The roof area is usually divided into compartments.

- 1 Vapour barrier
- 2 SikaRoof® Control Pipe
- 3 Thermal insulation
- 4 FPO or PVC roofing membrane
- 5 FPO or PVC Pipe Flashing 110
- 6 Insulation plug with cap

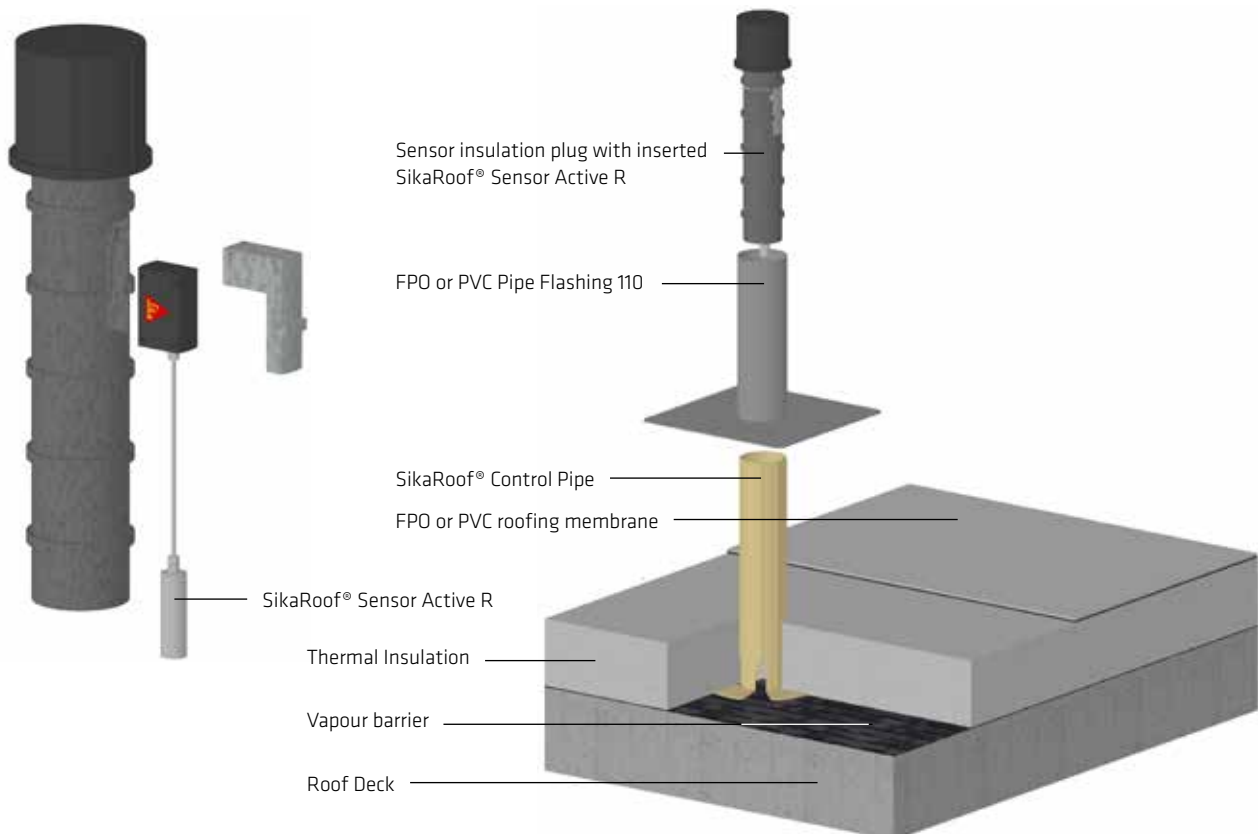
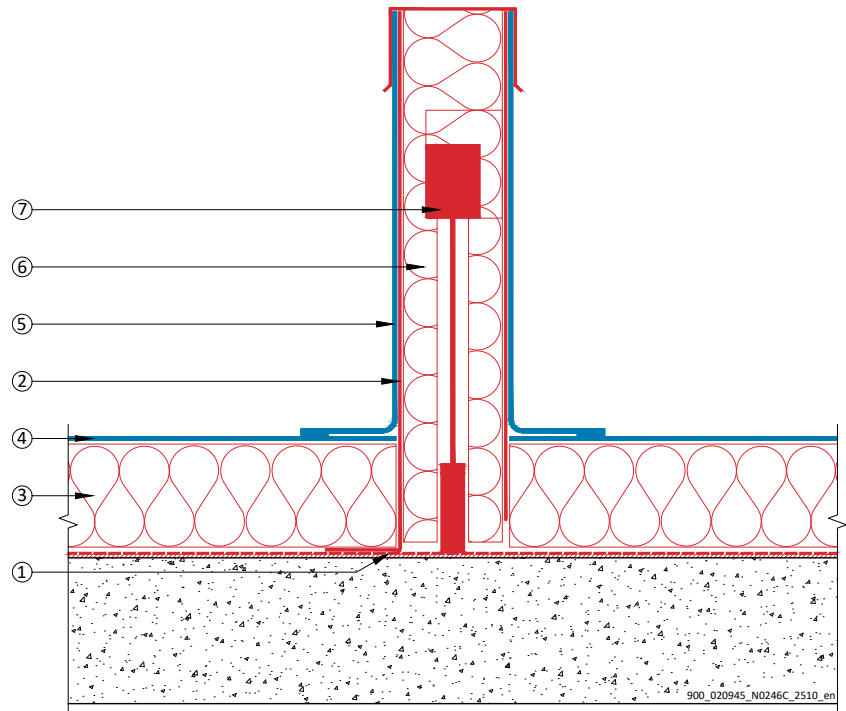


# SikaRoof® MONITORING

## ROOF CONTROL PIPE WITH INTEGRATED 24/7 MONITORING

Permanent electronic roof monitoring in the control pipe with SikaRoof® Sensor Active R. The roof area is usually divided into compartments.

- 1 Vapour barrier
- 2 SikaRoof® Control Pipe
- 3 Thermal insulation
- 4 FPO or PVC roofing membrane
- 5 FPO or PVC Pipe Flashing 110
- 6 Sensor insulation plug with cap
- 7 SikaRoof® Sensor Active R

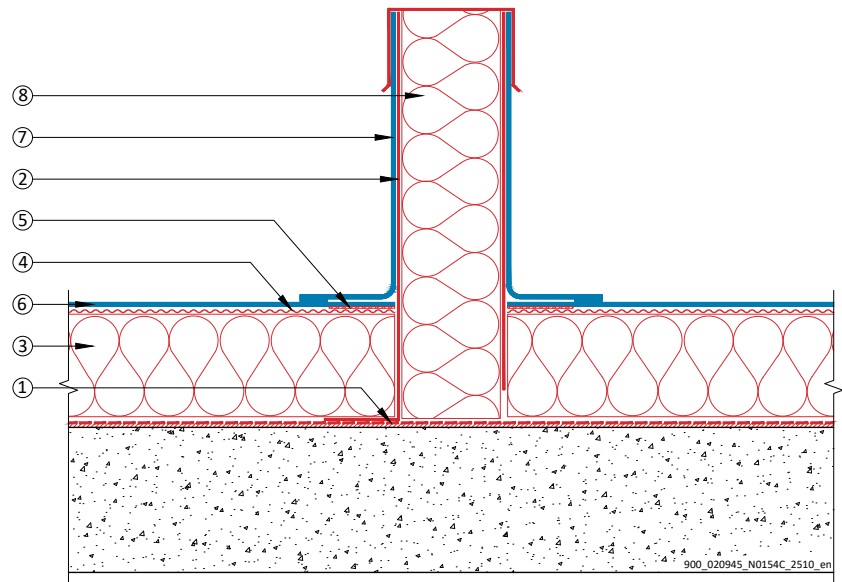


# SikaRoof® CONTROL

## ROOF CONTROL PIPE AND INTEGRATED LEAK DETECTION POSSIBILITY

Enables inspecting any water ingress by visually inspecting the control pipe on the roof and precise leak detection possibility.

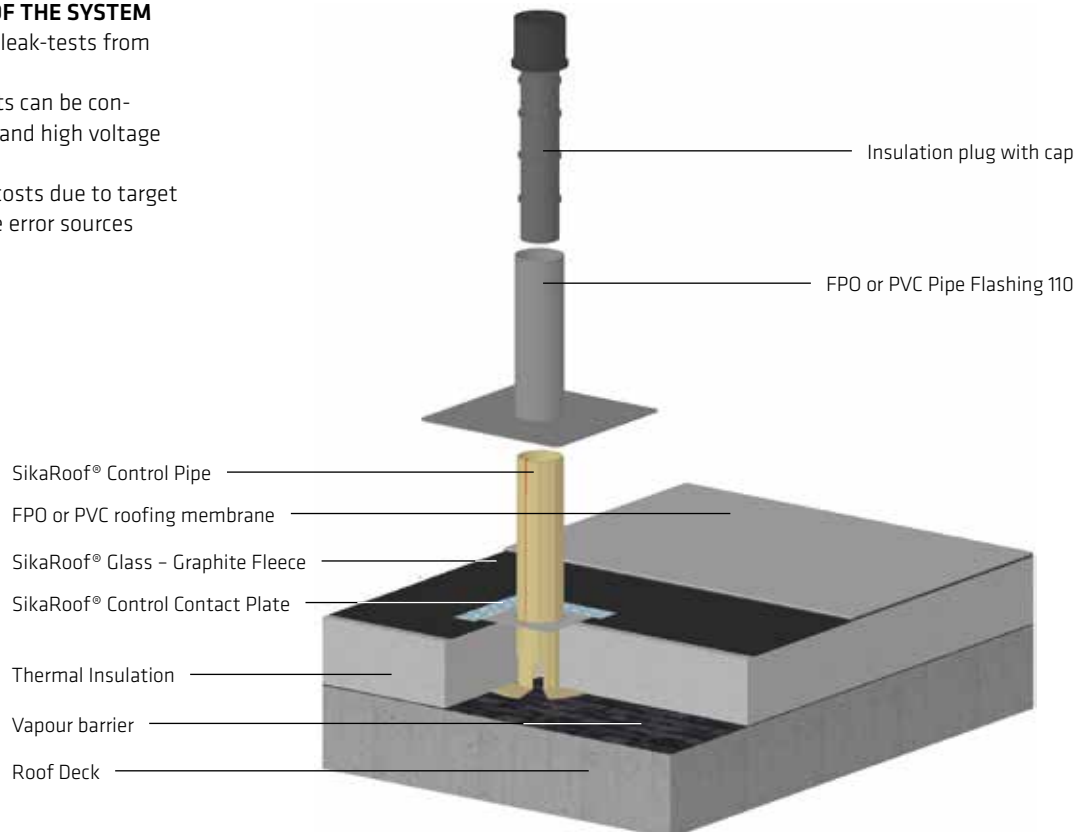
- 1 Vapour barrier
- 2 SikaRoof® Control Pipe
- 3 Thermal insulation
- 4 SikaRoof® Glass – Graphite fleece
- 5 SikaRoof® Control Contact Plate
- 6 FPO or PVC roofing membrane
- 7 FPO or PVC Pipe Flashing 110
- 8 Insulation plug with cap



The System is suitable for new construction and refurbishment projects. In the construction phase of the roof, the electrically conductive special glass / graphite fleece or stainless steel mesh needs to be installed below the roofing membrane on top of the thermal insulation. In order to carry out leak detection, two control pipes together with the stainless steel contact plate are installed every 1,500 m<sup>2</sup>. This gives an easy access point to the technician to connect the leak detection device.

### MAIN ADVANTAGES OF THE SYSTEM

- Possibility of simple leak-tests from the beginning
- Leak detection / tests can be conducted with the low and high voltage method
- Significant reduced costs due to target determination of the error sources

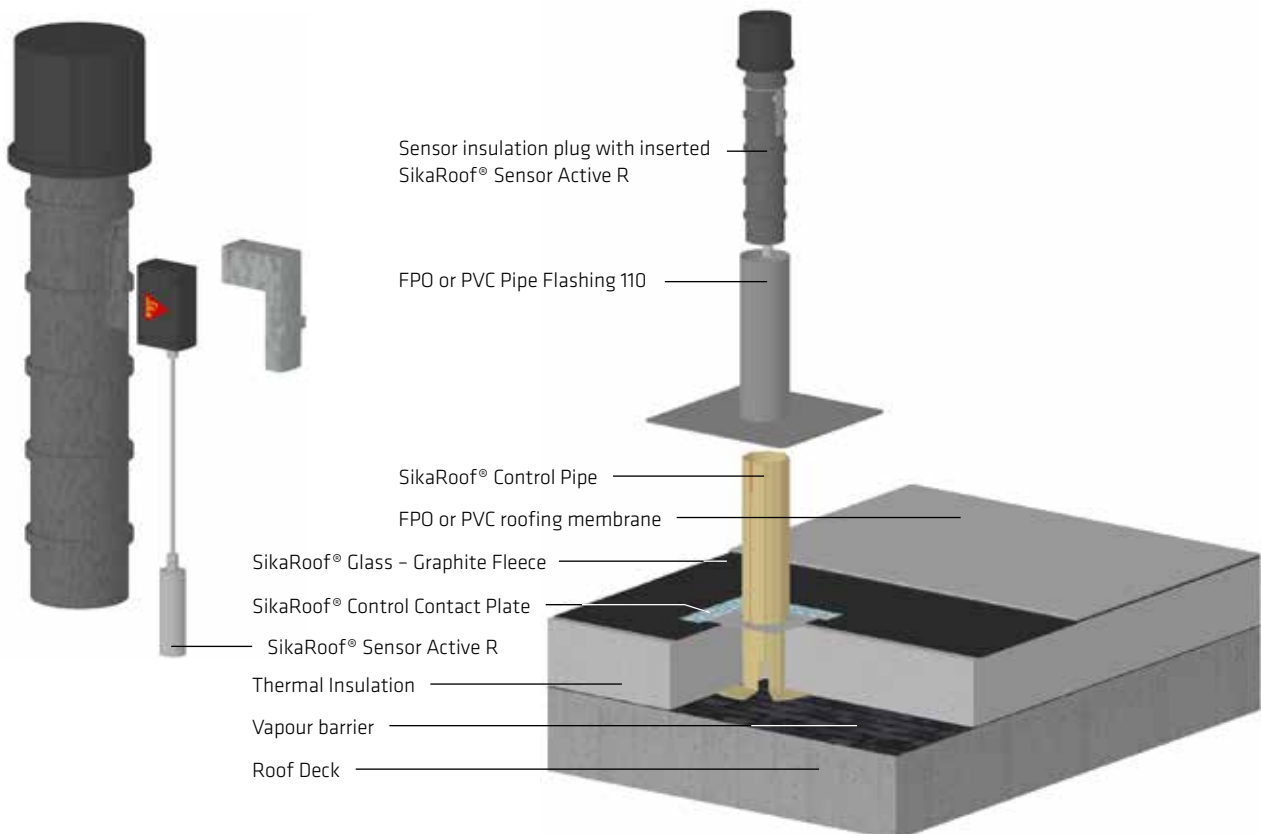
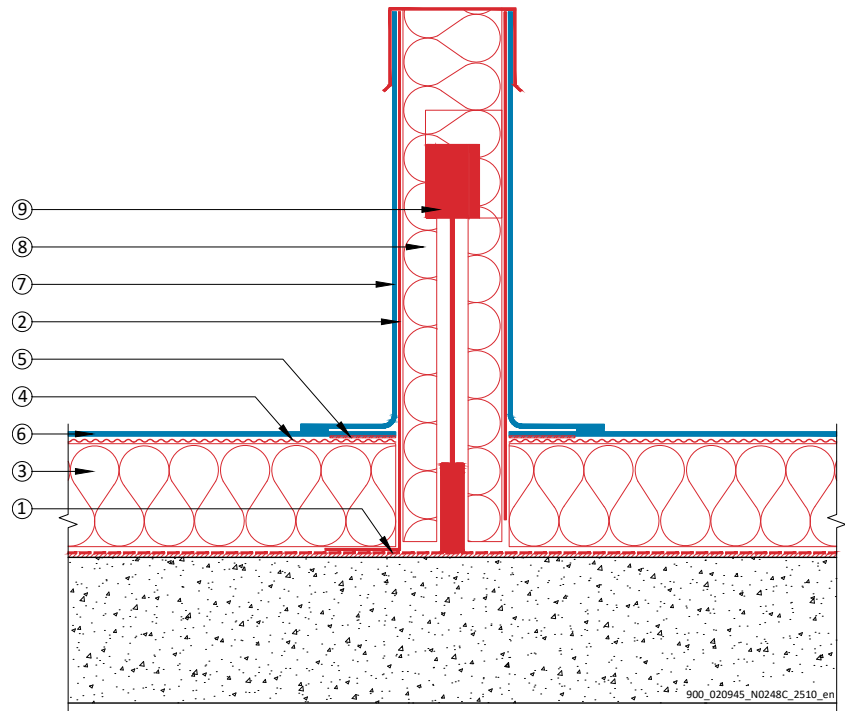


# SikaRoof® CONTROL – MONITORING

## ROOF CONTROL PIPE WITH INTEGRATED 24/7 MONITORING AND LEAK DETECTION POSSIBILITY

Permanent electronic roof monitoring in the control pipe with SikaRoof® Sensor Active R. The roof area is usually divided into compartments.

- 1 Vapour barrier
- 2 SikaRoof® Control Pipe
- 3 Thermal insulation
- 4 SikaRoof® Glass – Graphite Fleece
- 5 SikaRoof® Control Contact Plate
- 6 FPO or PVC roofing membrane
- 7 FPO or PVC Pipe Flashing 110
- 8 Sensor insulation plug with cap
- 9 SikaRoof® Sensor Active R



# COMPARTMENT / WATERSTOP SYSTEM

SYSTEM FOR LIMITING THE AREA OF WATER SPREAD INSIDE THE ROOF

## ROOF COMPARTMENTS WITH THE WATERSTOP SYSTEM

To achieve a compartment system, the roof area shall be divided into smaller areas of 100 m<sup>2</sup> up to 600 m<sup>2</sup>, in order to limit the leaking area when the roof ever becomes damaged. The compartment is executed with the waterstop system.

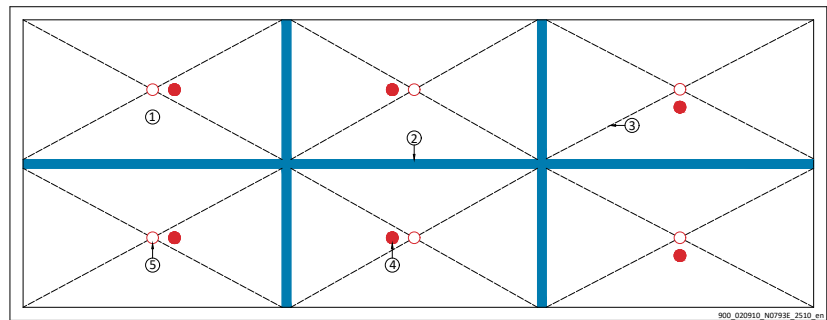
The design and layout of the compartment system should be co-ordinated with roof valleys and the drainage system. Waterstops are typically positioned at high points and the control pipe at the low point of the roof. Each compartment needs to be provided with a control pipe.

Waterstops form a watertight seal between the roofing membrane and the vapour barrier in order to minimize water damage in case of a leak. Waterstops are important safety components. Besides subdividing roofs into smaller areas, they separate special zones from the rest of the roof. Waterstops are installed to divide the roof into compartments.

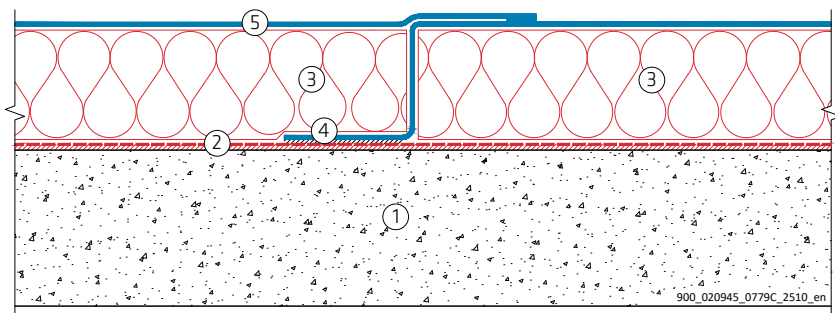
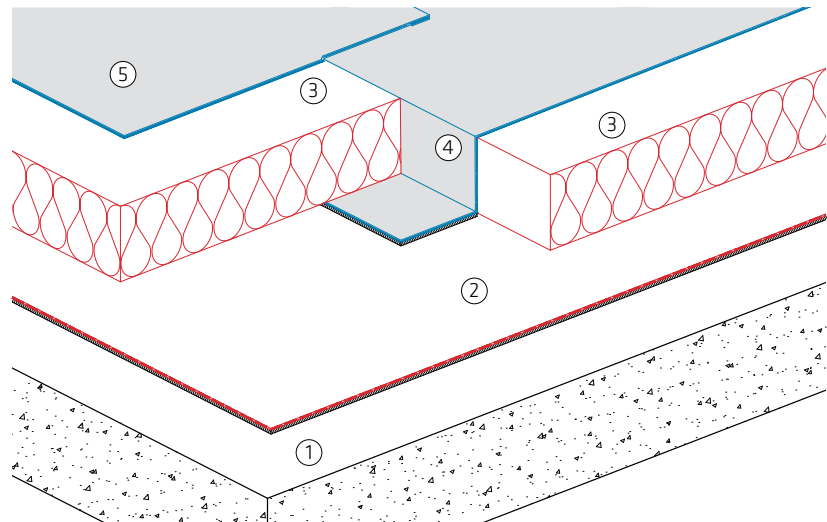
Compartment size:

- 100 to 300 m<sup>2</sup> (if the protective layer is difficult to remove)
- 300 to 600 m<sup>2</sup> (if the protective layer is easy to remove)

- 1 Compartment
- 2 Waterstop
- 3 Valley
- 4 Control pipe
- 5 Roof drain



- 1 Roof deck
- 2 Vapour barrier, fully adhered
- 3 Thermal insulation
- 4 FPO or PVC roofing membrane adhered to vapour barrier
- 5 FPO or PVC roofing membrane hot-air welded to the already installed FPO or PVC roofing membrane



# SikaRoof® MONITORING

## SYSTEM FOR PERMANENT 24/7 ROOF MONITORING

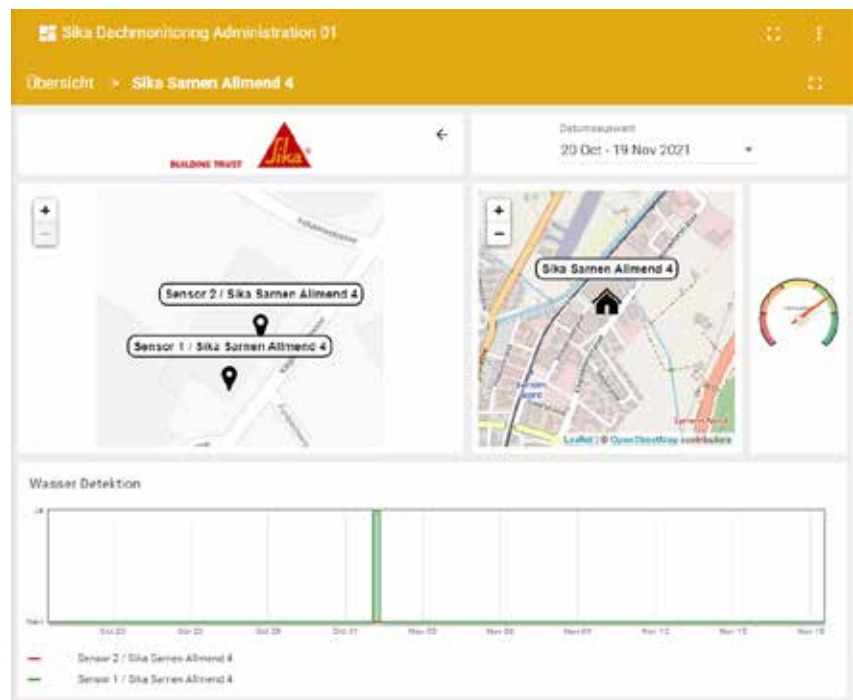
### SYSTEM FOR PERMANENT 24/7 ROOF MONITORING

- Radio based sensor system based on latest LTE/NB-IoT Network technology
- One Sensor covers up to 300 m<sup>2</sup> roof area
- Sensors are very easy accessible at any time after installation
- Plug and play system – installed by the roofing contractor
- Suitable also for retrofitting on existing flat roofs
- Self-sufficient electric power supply with long life batteries
- Detects liquid water on the vapour barrier
- Monitors the relative humidity and temperature inside the roof build-up
- In case of roof damage – informs the building owner and or roofing contractor via Email



### MONITORING APP

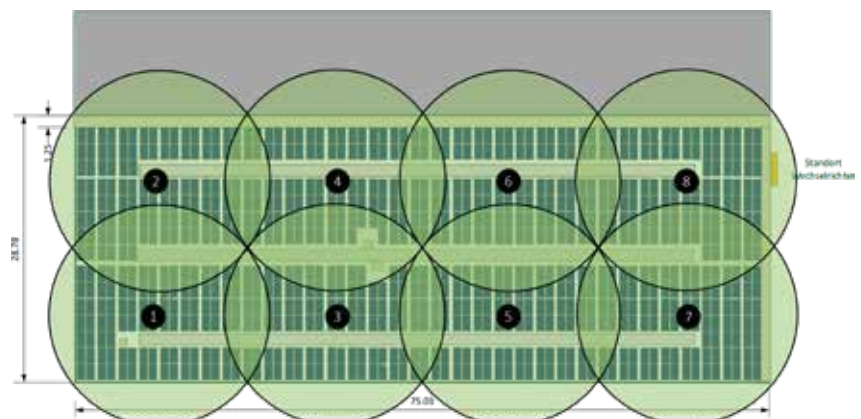
Easy, informative and intuitive. The monitoring App can be used on computers and smartphones and provides you real time data 24/7.



### SENSOR LAYOUT SCHEME

Example

- Total roof size 2,400 m<sup>2</sup>
- Complete roof monitoring with eight pieces
- Sensors with a coverage rate of 300 m<sup>2</sup> each



# SikaRoof® LEAK DETECTION

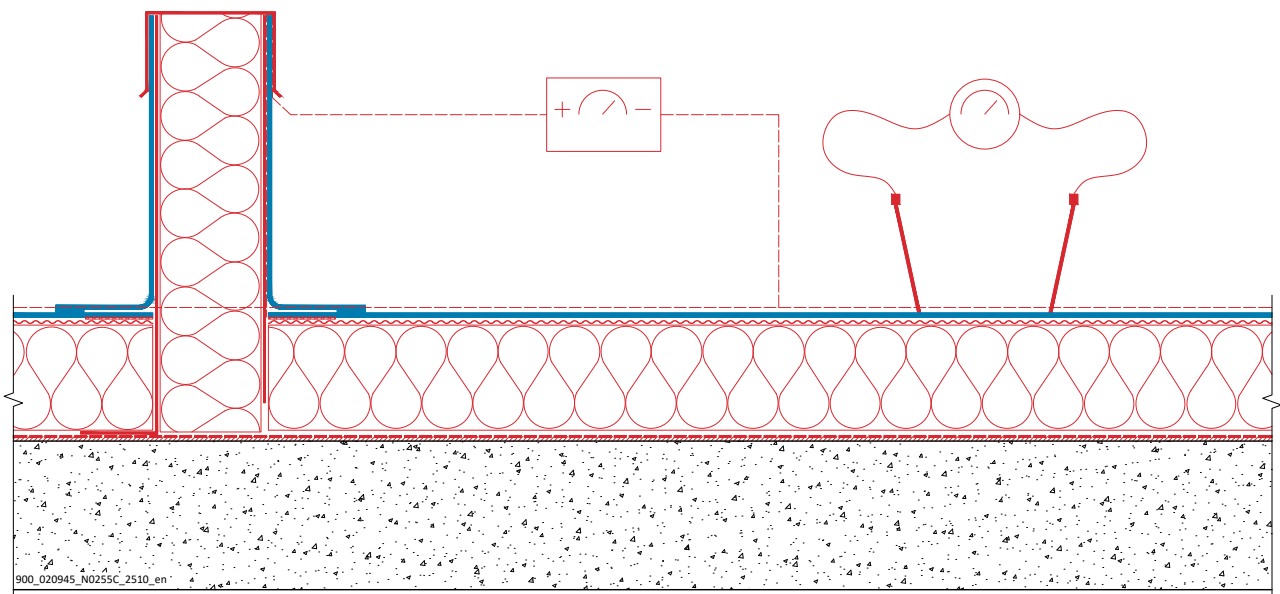
## LEAK DETECTION WITH LOW VOLTAGE



<https://leak-detection.com/>

Low voltage leak detection requires only a thin film of water on the tested surface. The negative output of the generator is applied to the trace wire which borders the test area, whilst the positive output is connected to a suitable building substrate. If water has penetrated the roofing membrane within the test area, a current will flow from this source point, via the water on the roof towards the trace wire. The detector is used to identify the direction of electrical current and detect the point of origin (where water is penetrating the roofing membrane).

**Note:** The roof layers above the roofing membrane must be water-permeable. An electrically conductive layer is required below the roofing membrane.



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# SikaRoof® LEAK DETECTION

## LEAK DETECTION WITH HIGH VOLTAGE



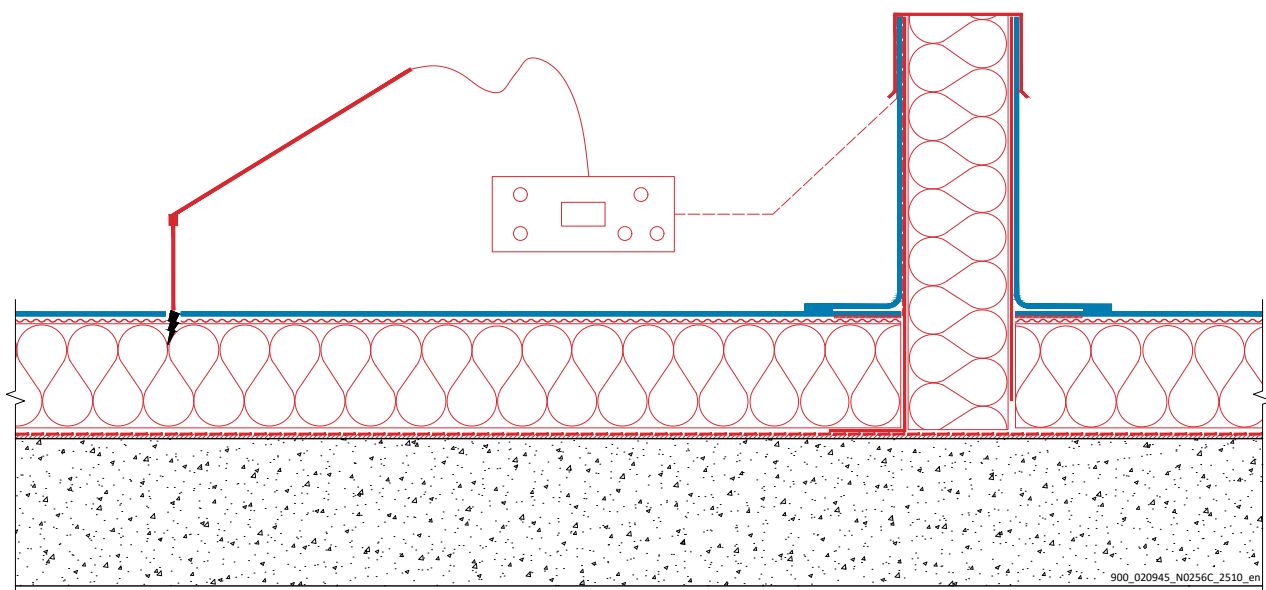
**Supplier:**  
**ELIS TECH s.r.o.**  
Živnostenská 2, Bratislava  
811 06 Slovakia  
[www.elis.tech](http://www.elis.tech)



**eRaptor 2.0**  
**Instructional**  
**Video**

The earth lead from the high voltage test device is connected to a convenient earth point on the structure. A high voltage DC current is applied to the dry surface of the roofing membrane. When there are no faults present, the roofing membrane acts as an electrical insulator by stopping the flow of current out of the device. When the electrode passes a fault or hole, the high voltage jumps the gap between the electrode and the conductive layer below the roofing membrane, causing a current to flow. The audible and visual alarm of the testing device will alert the operator.

**Note:** The surface / roof membrane needs to be completely dry. An electrically conductive layer is required below the roofing membrane.



# SikaRoof® CONTROL – MONITORING

## PRODUCT PORTFOLIO

### Control Pipe Set



#### DESCRIPTION

The Control Pipe Set is made of rigid high quality polypropylene (PP) pipe and cap, expanded polypropylene (EPP) insulation plug and prefabricated Sarnafil® flashing.

#### USES

The Control Pipe Set enables to check the watertightness of a flatroof from the rooftop.

#### CHARACTERISTICS / ADVANTAGES

- Resistant to UV exposure
- Ease of application

#### PACKAGING

The Control Pipe Set consists of:

- 1 pcs. SikaRoof® Control Pipe 110
- 1 pcs. Insulation plug with cap
- 1 pcs. Pipe flashing 110 (FPO or PVC)

### Control Pipe Set for SikaRoof® Sensor Active R



#### DESCRIPTION

The Control Pipe Set for SikaRoof® Sensor Active R comprises of 3 parts. A rigid high quality polypropylene (PP) pipe, an expanded polypropylene (EPP) insulation plug with cap and a prefabricated Sarnafil® flashing.

#### USES

The Control Pipe Set may only be used by experienced professionals. The Control Pipe Set enables to house the SikaRoof® Sensor Active R and provides an inspection point on the flat-rooftop to check / monitor the watertightness.

#### CHARACTERISTICS / ADVANTAGES

- Easily installed
- Suitable for new projects and retrofitting existing flat roofs

#### PACKAGING

The Control Pipe Set consists of:

- 1 pcs. SikaRoof® Control Pipe 110
- 1 pcs. Insulation plug with cap
- 1 pcs. Pipe flashing 110 (FPO or PVC)

### SikaRoof® Control Contact Plate



#### DESCRIPTION

The SikaRoof® Control Contact Plate is a stainless steel plate to connect the applied conductive glass felt with the read-out device.

#### USES

SikaRoof® Control Contact Plate may only be used by experienced professionals.

- Contact plate between the applied conductive glass felt and the read-out device

#### CHARACTERISTICS / ADVANTAGES

- Easy application without the use of fasteners
- Plate includes the the 800 mm long connection wire

# SikaRoof® CONTROL – MONITORING

## PRODUCT PORTFOLIO

### SikaRoof® Sensor Active R



#### DESCRIPTION

The SikaRoof® Sensor Active R is a battery powered, wireless sensor for water detection and monitoring the humidity in flat roof build-up.

#### USES

SikaRoof® Sensor Active R may only be used by experienced professionals.

- SikaRoof® Sensor Active R is used to detect water ingress and to monitor the humidity in flat roof build-up

#### CHARACTERISTICS / ADVANTAGES

- Radio based sensor system based on latest IoT-Net-work technology
- Easily installed, no electrician required on job-site
- Easily to start-up due to plug-and-play system
- Self-sufficient electric power supply with batteries
- Suitable for new construction, refurbishment and retrofitting

### SikaRoof® Glass – Graphite Fleece



#### DESCRIPTION

SikaRoof® Glass – Graphite Fleece is a conductive and fire protection layer made of non-woven glass fibre.

Applied in combination with ballasted and mechanically fastened roofing membranes.

#### USES

SikaRoof® Glass – Graphite Fleece may only be used by experienced professionals.

SikaRoof® Glass – Graphite Fleece is used as a conductive layer to facilitate leak detection below Sarnafil® roofing membranes.

#### CHARACTERISTICS / ADVANTAGES

- Easily applied
- Suitable for mechanically fastened and ballasted roof systems

#### TECHNICAL INFORMATION

Roll dimension: 2 x 50 m  
Weight: 120 g/m<sup>2</sup>

### SikaRoof® Stainless Steel Mesh



#### DESCRIPTION

SikaRoof® Stainless Steel Mesh is an electrically conductive stainless steel mesh.

#### USES

SikaRoof® Stainless Steel Mesh may only be used by experienced professionals. SikaRoof® Stainless Steel Mesh is used as a conductive layer to facilitate leak detection below adhered Sarnafil® roofing membranes.

#### CHARACTERISTICS / ADVANTAGES

- Highly electrically conductive
- Easily applied
- Corrosion resistant
- Not flammable
- Suitable for adhered roof systems

#### TECHNICAL INFORMATION

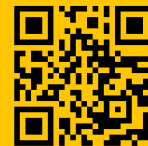
Roll dimension: 1.50 x 40 m  
Weight: 87 g/m<sup>2</sup>



#### **Disclaimer**

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# FURTHER ROOFING PUBLICATIONS AVAILABLE FROM SIKA



## WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



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