



# WATERPROOFING SIKA SOLUTIONS FOR BELOW GROUND STRUCTURES

BUILDING TRUST



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## BENEFIT OF OUR SOLUTIONS

Sika is the world's leading waterproofing company and has been producing innovative and high quality waterproofing products since 1910.

Our fully integrated and compatible system solutions are sustainably produced and well proven in practice for many decades all over the world; tested and certified according to various international test standards. Sika offers clients, specifiers and contractors the security of clearly defined performance characteristics and the most robust solutions for their specific requirements.

**For further information, please call 01707 363834 or email [waterproofing@uk.sika.com](mailto:waterproofing@uk.sika.com)**

# ALL ROUND SOLUTIONS FOR WATERPROOFING

**SIKA IS COMMITTED TO PROVIDING PROVEN AND ECONOMIC WATERTIGHT SOLUTIONS FOR EVEN THE MOST CHALLENGING REQUIREMENTS.** We consider the entire waterproofing process to the very last detail and can provide solutions for both new build and refurbishment projects. We have a wide range of systems for both keeping water in and keeping water out.



## BELOW GROUND WATERPROOFING SOLUTIONS FOR:

### 1 RESIDENTIAL BUILDINGS

Storage rooms, wellness and fitness areas or movie theatres.

### 2 COMMERCIAL OFFICE BUILDINGS

Computer rooms, storage rooms and print rooms.

### 3 ARCHIVES/LIBRARIES

Completely dry basement waterproofing solutions for humid sensitive archive rooms.

### 4 UNDERGROUND PARKING AREAS

### 5 UNDERGROUND RAIL STATIONS AND TUNNELLING

Specific waterproofing solutions for cut and cover and TBM construction methods.

### 6 RETAIL UNITS AND WAREHOUSES

Complete dry waterproofing solutions to protect goods against humidity.

### 7 LEISURE FACILITIES

Below ground leisure facilities and indoor swimming pools and other sports rooms.

## OTHER WATERPROOFING SOLUTIONS FOR:

### 8 PODIUM DECKS AND BALCONIES

For balconies and walkways.

### 9 TANK LININGS

Attenuation and sprinkler tanks, potable water tanks, reservoirs and dirty water systems.

# SIKA SERVICES

**SIKA PROVIDES A FULL RANGE OF WATERPROOFING SOLUTIONS FOR DIFFERENT REQUIREMENTS IN NEW BASEMENT CONSTRUCTION AND REFURBISHMENT.** With more than 100 years of experience in Structural Waterproofing, Sika is the reliable partner for all of the parties involved on every project. Innovative Sika waterproofing solutions that include both rigid and flexible waterproofing systems, create Added Value for our customers every day and support our customers everywhere – right from the initial project design and detailing, through to successful installation and completion on site.

## DESIGN SUPPORT



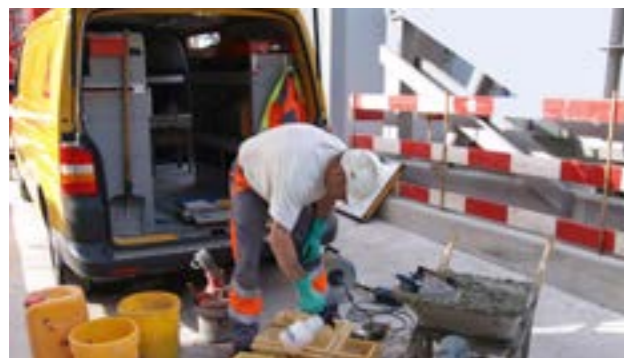
- Selection of appropriate concept and system solutions
- Concrete mix design and control
- Engineering details, custom solutions
- Cost/Performance/Life cycle analysis

## SPECIFICATION SUPPORT



- Specifications and Method Statements
- Detail drawings including CAD and 3D
- Watertight guarantee concepts

## SITE SUPPORT



- Concrete laboratories (incl. mobile units)
- Application training on site
- Troubleshooting
- Quality Control procedures
- Approved contractor scheme

## MAINTENANCE SUPPORT



- Maintenance Manuals
- Refurbishment systems
- Repair and refurbishment documentation
- Site Inspection and refurbishment proposals
- Approved contractor scheme

The specification detailing and product selection is critical to ensure the long term success of the project. Sika therefore provide a range of support services to assist architects, contractors and engineers including:



- A technical advisory department, onsite support and after sales service
- Detailed assessment of project and performance criteria
- NBS and CSI\* specification clauses
- Complete material data, installation guidelines, health and safety information and where appropriate maintenance schedules
- Specification service
- The Training Academy, to ensure internal staff, contractors, clients and specifiers have a full understanding of systems

\* Construction Specification Institute

## REGISTERED WATERPROOFING CONTRACTOR SCHEME

The Registered Waterproofing Contractors Scheme has been introduced for use in conjunction with the Sika®-1 Pre-bagged waterproofing system, SikaProof® and Sikaplan®. The need to reduce the risk to both specifier and client has given rise to this scheme, which is designed to facilitate the selection of assessed contractors. It allows total quality control – from product to service to installation, granting clients complete peace of mind with a wholly professional service nationwide. The main benefit of the Registered Contractor Scheme is to help minimise risk. Not only can clients be sure of excellent standards of materials and workmanship, both can be guaranteed for a period of up to 15 years.

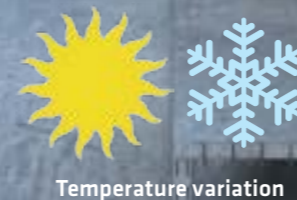


The criteria includes:

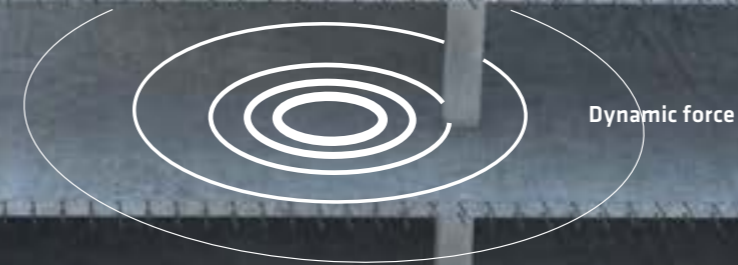
- Stable trading history
- Satisfactory project references
- Proven commitment to safety, health and environment
- Compliance with all relevant British Standards
- Appropriate insurance cover
- VAT Registered

# EXPOSURE AND STRESS

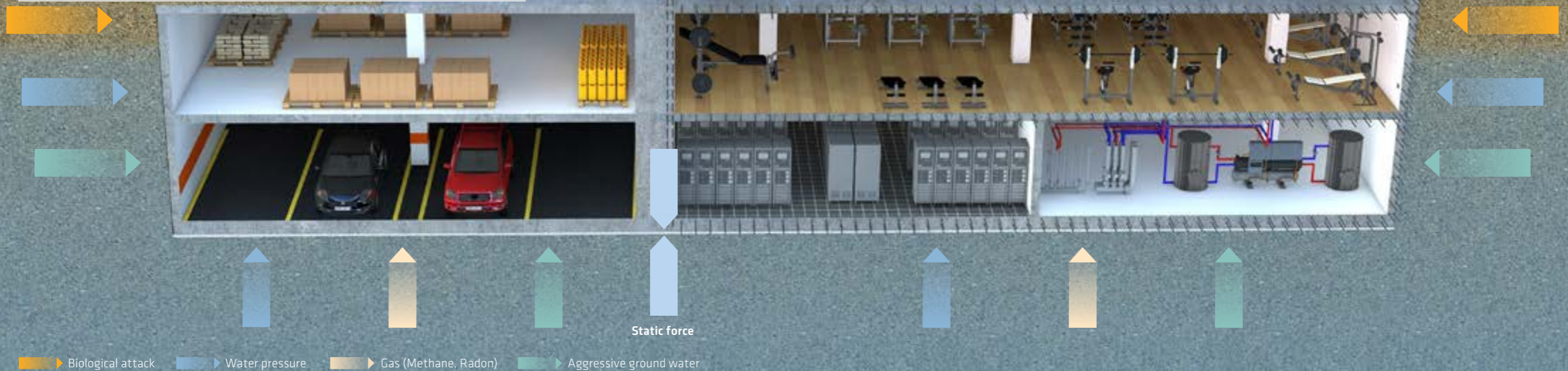
**WATERPROOFING SYSTEMS** for below ground structures are faced with stringent requirements regarding durability, exposure and stress conditions. Today, owners generally request a service life of buildings of 50 years or more and infrastructure of up to 120 years. Lack of watertightness can severely reduce the long-term durability of buildings and below-ground structures. This can badly affect its planned use as water ingress will result in physical attack and deterioration of the concrete and embedded steel..



Temperature variation



Dynamic force



Static force

▶ Biological attack  
 ▶ Water pressure  
 ▶ Gas (Methane, Radon)  
 ▶ Aggressive ground water

## TYPE OF EXPOSURE AND STRESS

Below ground structures can be subject to many different exposure conditions including:

- Different levels of water exposure and pressure (e.g. damp soil, percolating water or water under hydrostatic pressure, and open water, variable water tables)
- Aggressive ground water containing chemicals (commonly sulfates and chlorides in solution)
- Unequal static forces (due to load, settlement, or uplift)
- Dynamic forces (e.g. from settlement, seismic activity)
- Temperature variations
- Gases in the ground (e.g. Methane and Radon)
- Aggressive biological influences (plant roots/growth, fungal or bacterial attack)

## EXPOSURE IMPACT ON BELOW GROUND STRUCTURES

These different types of exposure may adversely influence the use, watertightness and durability of a basement structure, resulting in a reduced service life of the entire structure.

Exposure	Impact on structure
Water ingress	→ Damage to structure, finishes, contents and the internal environment (condensation and mould growth etc.), loss of thermal insulation, corrosion of steel reinforcement
Aggressive chemicals	→ Concrete damage (due to sulfate attack), corrosion of steel reinforcement (due to chloride attack)
Unequal static forces	→ Structural cracking
Dynamic forces	→ Structural cracking
Temperature variations	→ Condensation, scaling or cracking of concrete
Gas penetration	→ Gas penetration and exposure for occupants
Fungal/bacterial attack	→ Damage to the waterproofing system, finishes or contents

# PROJECT CONSIDERATIONS





To define the appropriate waterproofing strategy and type of system for a specific project, it is important to consider not only the ground conditions but also the project requirements of the owner. The functionality and future use, service life and the total cost of ownership should also be considered.

## Project considerations

- 1 Functionality (Use, grade of watertightness)
- 2 Service Life / Durability
- 3 Total Cost of Ownership (incl. maintenance cost)

## 1 DEGREE OF WATERTIGHTNESS

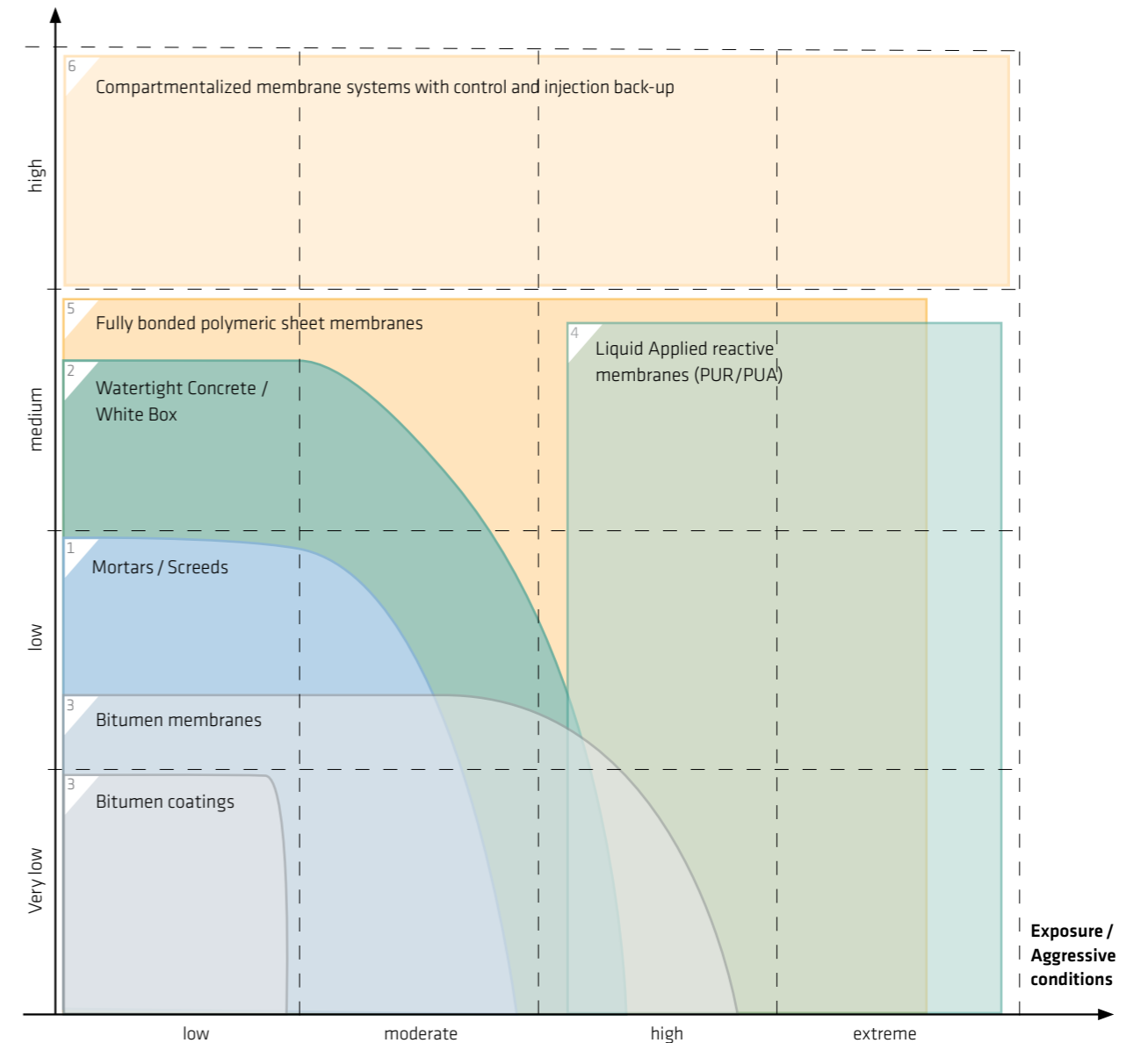
The British standard BS 8102:2009 describes different levels of watertightness required for the end use of a structure.

GRADE 1	GRADE 2	GRADE 3	ADDITIONAL REQUIREMENTS (FORMERLY GRADE 4)
<p><b>Basic utility</b> Some seepage and damp areas tolerable*</p> <p>* Dependent on use</p>  <ul style="list-style-type: none"> <li>Underground car parks</li> <li>Plant rooms</li> <li>Workshops</li> </ul>	<p><b>Better utility</b> No water penetration. Ventilation may be required</p>  <ul style="list-style-type: none"> <li>Underground car parks</li> <li>Storage areas</li> <li>Workshops</li> <li>Electrical plant rooms</li> </ul>	<p><b>Habitable</b> No water penetration, totally dry environment</p>  <ul style="list-style-type: none"> <li>Ventilated residential units and offices</li> <li>Restaurants and commercial areas</li> <li>Leisure facilities</li> </ul>	<p><b>As Grade 3 plus: Consider internal environment required</b></p> <ul style="list-style-type: none"> <li>Air conditioning</li> <li>Ventilation</li> <li>Radon and methane protection</li> </ul>  <ul style="list-style-type: none"> <li>Residential areas</li> <li>Computer rooms</li> <li>Archives</li> <li>Special purpose facilities and areas</li> </ul>

# SERVICE LIFE / DURABILITY

## 2 SERVICE LIFE / DURABILITY

The performance of each different waterproofing technology can generally be positioned as follows:



## 3 TOTAL COST OF OWNERSHIP

The total cost of ownership (TCO) includes all of the building costs for the entire service life of the structure, including the initial investment, the cost of any loss or damage to interior furnishings and goods etc. due to water ingress, the cost of any repair and maintenance, plus the cost of any downtime during any such works.

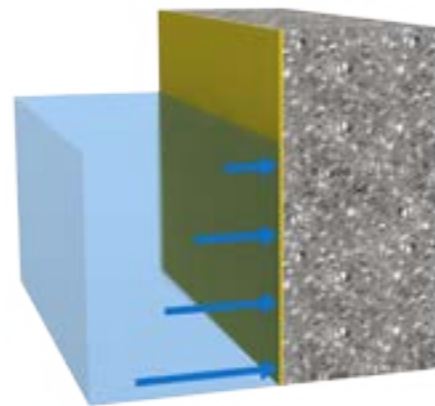
# BASEMENT WATERPROOFING CONCEPT

BS 8102:2009 outlines three different waterproofing methods, the choice of which should take all of the relevant project requirements into consideration. The standard suggests consideration be given to the use of dual systems. For example, Type A plus Type B protection where the assessed risks are deemed to be high or the consequences of a failure to achieve the required internal environment are too high. Sika are able to offer a complete solution in these circumstances.

## EXTERNAL WATERPROOFING SYSTEM (TYPE A)

A waterproofing barrier applied on the external surfaces that are exposed to ground water (positive side). The structure is protected against water ingress and also against any aggressive substances or influences. For some materials such as post applied waterproofing mortars and coatings, access to the external surfaces is required for application after concreting.

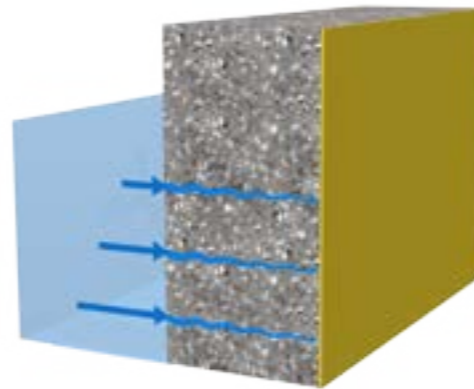
- Grade of watertightness: Grades 1-3 plus additional requirements
- Application: New construction
- Protection provided: Waterproofing & concrete protection
- Durability: Low to high durability (dependent upon application)



## INTERNALLY APPLIED WATERPROOFING SYSTEM (TYPE A)

A waterproof barrier is applied on the internal surfaces of the structure (negative side). These systems do not prevent damage to the structure from water ingress, nor concrete damage due to aggressive chemicals. Generally these systems are applied as coatings or sheet membrane linings, and are recommended for refurbishment works for example where access to the directly exposed surfaces is not possible.

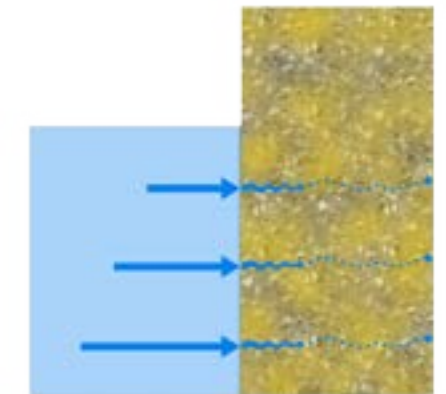
- Grade of watertightness: Grades 1-3
- Application: Generally for refurbishment or as additional measures
- Protection provided: Waterproofing
- Durability: limited durability (as the structure is unprotected)



## INTEGRAL WATERPROOFING SYSTEM (TYPE B)

A waterproofing system integrated into the concrete structure. Liquid water penetration is stopped by the structure itself and cannot entirely pass through into the basement. Typical products are admixtures for watertight concrete combined with appropriate joint sealing systems for connections, construction and movement joints.

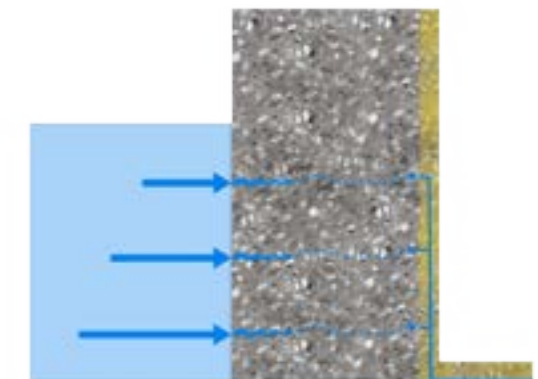
- Grade of watertightness: Grades 1-3
- Application: New construction
- Protection provided: Waterproofing
- Durability: Very high durability (for non-aggressive ground water)



## INTERNALLY APPLIED WATERPROOFING SYSTEM (TYPE C)

The system directs penetrating water into a drainage system and a collection sump before using a pump to discharge water from the building.

- Grade of watertightness: Grades 1-3
- Application: New construction/refurbishment
- Protection provided: Waterproofing
- Durability: Limited durability (as the structure is unprotected)



# SIKA WATERPROOFING PRODUCTS

PROJECT CONSIDERATIONS

PROJECT CONSIDERATIONS



Sika® Watertight Concrete



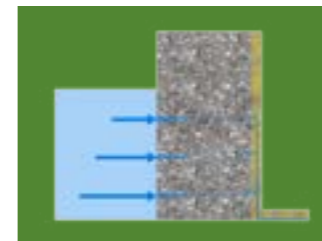
SikaProof®



Sikaplan®



Sikalastic®



Sika® Cavity Drainage



Sika®-1 System



SikaTop® / SikaSeal® / Sika® Igolflex®

Technology / Type of system	Sika® Watertight Concrete (Type B)		SikaProof® (Type A)		Sikaplan® (Type A)		Sikalastic® (Type A)		Sika® Cavity Drainage (Type C)		Sika®-1 System (Type A)		SikaTop® / SikaSeal® / Sika® Igolflex® (Type A)		
<b>Waterproofing Concept / Strategy</b>	Integral		Externally applied		Externally applied		Externally applied		Internally applied		Internally applied		Externally applied		
<b>Grade of watertightness</b>	Grades 1-3		Grades 1-3 plus additional requirements		Grades 1-3 plus additional requirements		Grades 1-3 plus additional requirements		Grades 1-3		Grades 1-3		Grades 1-2		
<b>Concrete protection</b>	High		High		Very high		Very high		Low		Low (high if external)		Limited		
<b>Water resistance level</b>	<ul style="list-style-type: none"> <li>High hydrostatic pressure</li> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>High hydrostatic pressure</li> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>Very high hydrostatic pressure</li> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>Medium hydrostatic pressure</li> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>High hydrostatic pressure</li> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		<ul style="list-style-type: none"> <li>Seepage / percolating water</li> <li>Rising capillary water</li> </ul>		
<b>Performance characteristics</b>	Crack-bridging: n.a.	Water vapour tightness: +	Chemical resistance: ++	Gas barrier: +	Durability: +++	Crack-bridging: ++	Water vapour tightness: +++	Chemical resistance: ++	Gas barrier: ++	Durability: ++	Crack-bridging: n.a.	Water vapour tightness: +	Chemical resistance: n.a.	Gas barrier: +	Durability: +
<b>Safety level / Reliability</b>	Medium		Medium to high		Very high		Medium		Medium to high		High		Low to medium		
<b>Excavation method</b>	Open excavation and piled walls		Open excavation and piled walls		Open excavation and piled walls		Only open excavation		n.a.		n.a.		Only open excavation		
<b>Repair in the event of leaks</b>	By local injection of limited areas. Damage is easy to locate		By crack injection		By injection of leaking compartments through integrated back-up system. Easy to control and locate due to control sockets or active control system. Re-injection possible.		By crack injection		Regular maintenance is required		By crack injection		By crack or area injection		
<b>Conditions of application</b>	<ul style="list-style-type: none"> <li>Limited to suitable temperatures for concreting works.</li> <li>No substrate preparation required</li> </ul>		<ul style="list-style-type: none"> <li>Controlled conditions required (temperature, water, humidity).</li> <li>Substrate preparation required</li> <li>Membrane must be protected until the reinforced concrete is placed</li> </ul>		<ul style="list-style-type: none"> <li>Substrate preparation required</li> </ul>		<ul style="list-style-type: none"> <li>Controlled conditions required (temperature, water, humidity)</li> <li>Substrate preparation required</li> <li>Fast installation</li> </ul>		<ul style="list-style-type: none"> <li>Substrate preparation maybe required</li> <li>Installation of sumps and pumps</li> <li>Regular maintenance of sumps and pumps</li> </ul>		<ul style="list-style-type: none"> <li>Substrate preparation required</li> <li>Stop running water</li> </ul>		<ul style="list-style-type: none"> <li>Controlled conditions required (temperature, water, humidity)</li> <li>Substrate preparation required</li> </ul>		
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Very cost effective</li> <li>No protection required (walls)</li> <li>Simple &amp; fast construction</li> <li>High durability</li> </ul>		<ul style="list-style-type: none"> <li>Highly efficient</li> <li>High performance</li> <li>Easy to apply</li> <li>Low risk</li> <li>High durability</li> <li>Approved Contractors available</li> </ul>		<ul style="list-style-type: none"> <li>High waterproofing security</li> <li>Very high performance</li> <li>Simple and fast to repair</li> <li>High durability / reliability</li> <li>Integrated system redundancy</li> <li>Approved Contractors available</li> </ul>		<ul style="list-style-type: none"> <li>High performance</li> <li>Easy detailing solutions</li> <li>High durability</li> </ul>		<ul style="list-style-type: none"> <li>Limited surface preparation required</li> <li>Can be used where the substrate does not have the strength to resist stresses caused by water pressure</li> </ul>		<ul style="list-style-type: none"> <li>Bonds to substrate</li> <li>Hardwearing surface</li> <li>No ongoing maintenance</li> <li>Approved Contractors available</li> </ul>		<ul style="list-style-type: none"> <li>Very cost effective</li> <li>Simple &amp; fast to apply</li> </ul>		

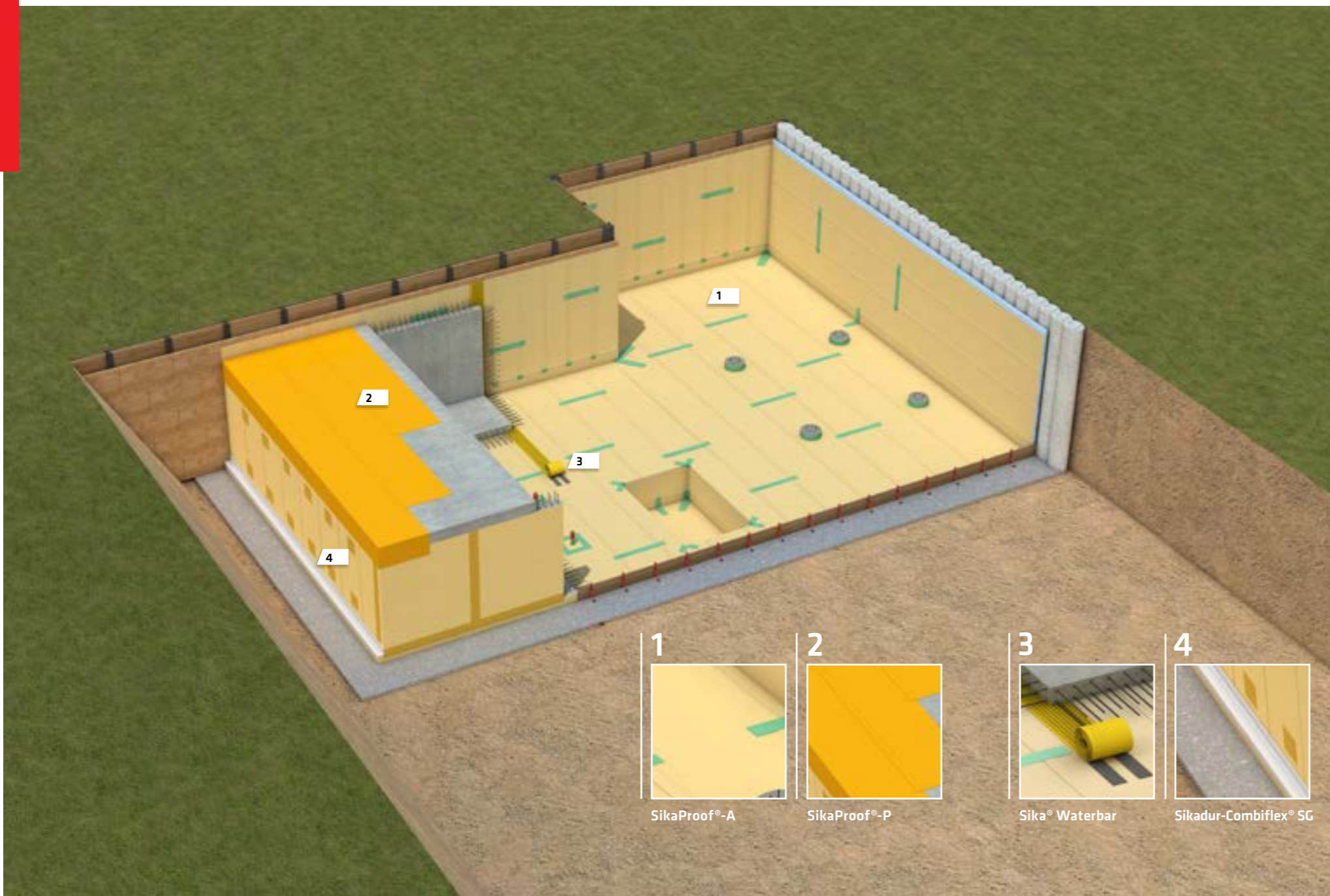


# SikaProof®-A FULLY BONDED MEMBRANE SYSTEM

## SIKA'S UNIQUE, PRE APPLIED, FULLY BONDED AND CRACK BRIDGING MEMBRANE SYSTEM.

SikaProof®-A consists of an embossed, highly flexible polyolefin membrane, with a unique grid pattern of sealant and a specially designed non-woven fleece.

TYPE A PROTECTION



1 SikaProof®-A      2 SikaProof®-P      3 Sika® Waterbar      4 Sikadur-Combiflex® SG

This unique system produces a durable mechanical bond to the fresh concrete. In addition, the sealant prevents any lateral water underflow and migration between the SikaProof®A membrane system and the structural concrete

Sikaproof can be used to waterproof all types of reinforced concrete basements and other below ground structures. Typical projects are;

- Residential and industrial buildings such as housing, commercial and leisure facilities
- Engineered structures such as retaining walls, tunnel shafts, cut and cover tunnels.

The benefits of the SikaProof® system are:

- High durability
- No lateral water underflow
- High flexibility and crack bridging ability
- Cost effective solution
- Approved detailings
- Effective radon and methane barrier
- Quality backed by Sika warranty and a BBA certificate.

SikaProof®-A complies with BS 8102:2009 Type A construction.

<b>SikaProof®-A</b>	Pre- and cold applied sheet waterproofing membrane system for application below base slabs, on single and double-faced formwork cast walls.
<b>SikaProof®-P</b>	Post-applied sheet waterproofing membrane system, specially designed for roof slabs and double-faced formwork cast walls.
<b>Complementary products for joint sealing and waterproofing:</b>	
<b>Sika® Waterbar</b>	Internal or external applied waterstops based on PVC, TPO or galvanised steel for construction and movement joints.
<b>Sikadur-Combiflex® SG System</b>	Over-banding sealing tape system for post-sealing and waterproofing of construction and movement joints, around penetrations and for connections.
<b>SikaSwell® Sealants and Profiles</b>	Range of hydrophilic profiles and gun applied sealants, designed for sealing and waterproofing of construction joints and penetrations.(e.g. pipe entries).
<b>SikaFuko® Injection hoses</b>	Injection hoses for construction joints and other details, with or without swelling strips, which can be used for sealing by injection and re-injection in the event of future movement etc.

TYPE A PROTECTION

# CASE STUDIES

## SikaProof®-A

### FARRINGDON STATION ACCESS SHAFTS, LONDON

This access shaft at the new Farringdon Underground Station, is part of the new Crossrail project, which will link Maidenhead and Heathrow in the west to Shenfield and Abbey Wood in the east, via 21km twin-bore tunnels running under central London. On completion, the Farringdon Interchange will link with London Underground and Thameslink and will become one of Britain's busiest train stations.

The shaft was formed by the construction of concrete piles around the perimeter, followed by the excavation of the enclosed earth from within. The pile rings and base slab were then constructed.

A safe and reliable waterproofing solution was required to prevent any water ingress through and around the base slab, which is of circular section, approximately 200m<sup>2</sup> in area, and situated 20 metres below ground level. Dense steel reinforcement within the base slab and the complicated detail at the intersection between the cast slab and the sprayed concrete lining, meant that traditional rear-guard waterbars were not an option to seal the joint.

The new, innovative, fully bonded waterproofing membrane system SikaProof® A-12 was selected to prevent water ingress through the base slab. It is a completely engineered solution, which produces a mechanical bond with the concrete, and incorporates a unique grid pattern of sealant that prevents any lateral water underflow and migration between the membrane and concrete.

SikaProof® A-12 is easy and simple to install and complies with BS 8102-2009 Type A construction. Sika® Tricosal Metal Waterstop, SikaSwell® A-2010 and SikaFuko® VT 1 jointing solutions were installed around the perimeter of the slab to protect against any water ingress at the interception of the slab and the walls.



### ASQUITH SPENCER PARK, WANDSWORTH, LONDON

CJ O'Shea and Co. Ltd, built a stunning new development at Asquith Spencer Park, comprising of four new homes designed by Chassey and Last Architects for Landview Properties, set within acres of rural scenery close to Wandsworth Common. Each home covers in excess of 425 square metres, with a lower floor basement, plus four additional floors above ground, together with associated landscaping and parking.

The basement area provides an extensive cinema and games room, together with a utility room and guest bedroom. The concept is to give the homeowners a seamless blend of high-end technology with refined family living.

A cost effective watertight solution for the basement was required, that would ensure complete watertightness and adhere to the principles laid out for Grade 3 of BS 8102:2009.

During the design development, CJ O'Shea chose a dual system from Sika Limited. This consisted of SikaProof® A, together with the Sika® Watertight Concrete system.

The membrane surface of SikaProof® A is embossed with a grid pattern, which contains a sealant, and is topped by a thin layer of fleece which forms a mechanical bond to the concrete when it dries. The grid pattern is also unique. It offers additional protection, due to the integrated sealant, which bonds tightly with the surface of the concrete, forming mini watertight compartments. Therefore, even if the membrane is damaged or pierced, moisture or pressured water cannot spread between the membrane and the concrete structure as it is contained within the small damaged grid square.

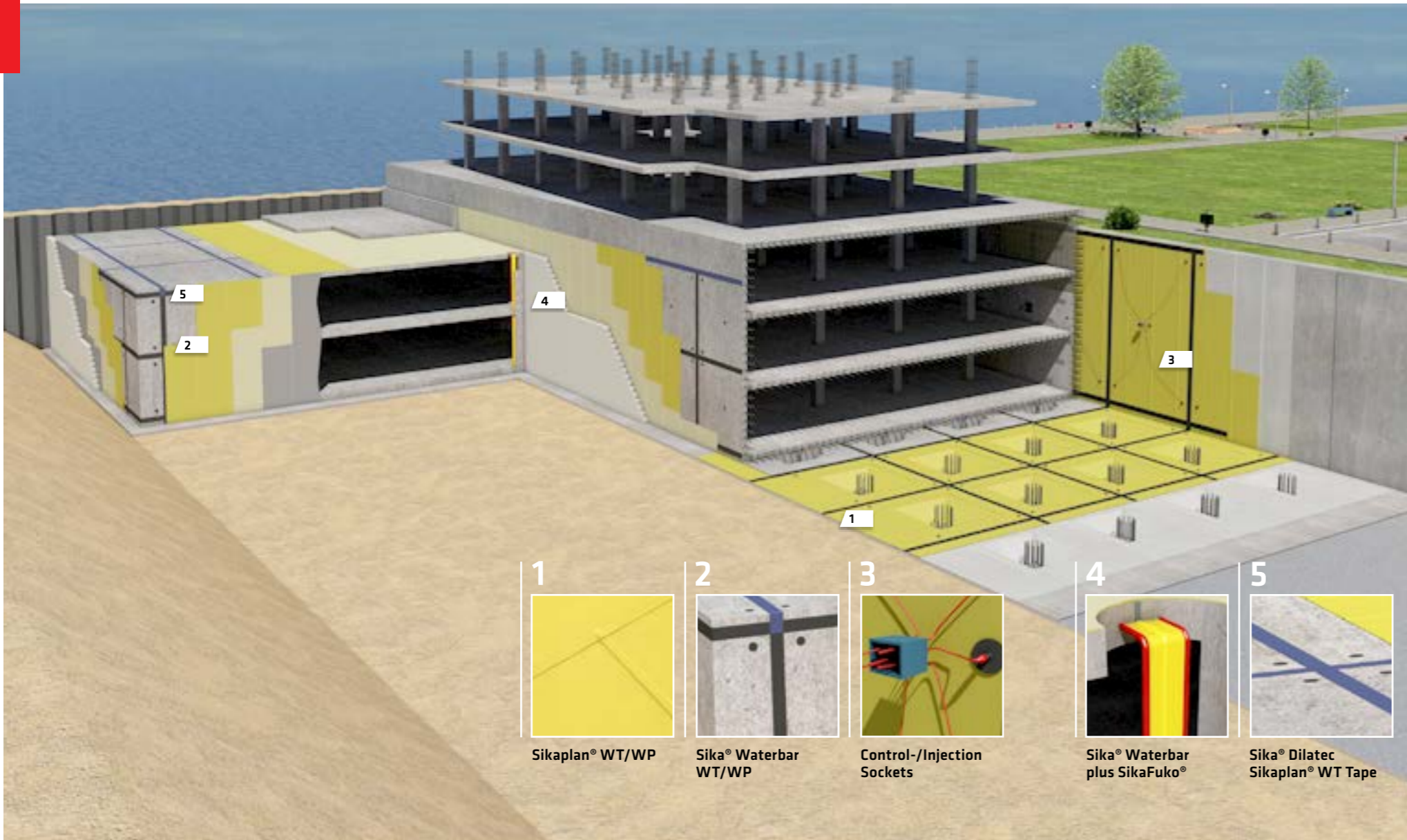
In this 'belt and braces' construction, Sika® Watertight Concrete system is also being used for all basement construction. Watertightness of the concrete is obtained by incorporating powerful, state-of-the-art, Sika admixtures in the mix. Hanson Concrete supplied 400m<sup>3</sup> of Sika Watertight Concrete to the project. Joints were sealed using the BBA approved SikaSwell® jointing system, which consists of joint sealing profiles that expand on contact with water.



# Sikaplan® COMPARTMENTALISED MEMBRANE SYSTEM

**HIGH PERFORMANCE, CRACK-BRIDGING AND FULLY CONTROLLED.** Highly flexible waterproofing systems using Sikaplan® PVC-P or FPO based sheet waterproofing membranes are installed externally and cover the entire basement structure in contact with the ground. The waterproofing layer is divided into 'compartments' with a network of cast in place compatible waterstops that are welded to the membrane.

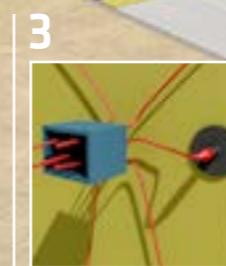
This allows very significant reduction of risk in the event of any leaks (e.g. from damage to the membrane). The position of the leak is easy to locate by the control and injection sockets and remedial action (i.e. injection) can be taken to ensure continued watertightness and concrete protection of the system at any time during its service life.



Sikaplan® WT/WP



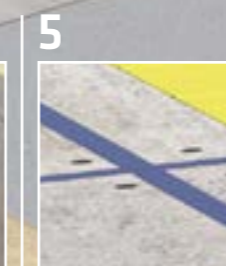
Sika® Waterbar  
WT/WP



Control-/Injection  
Sockets



Sika® Waterbar  
plus SikaFuko®



Sika® Dilatec  
Sikaplan® WT Tape

Sikaplan® systems are used extensively in heavy civil engineering situations or where highly aggressive conditions prevail.

## SIKA PRODUCTS AND SYSTEM SOLUTIONS

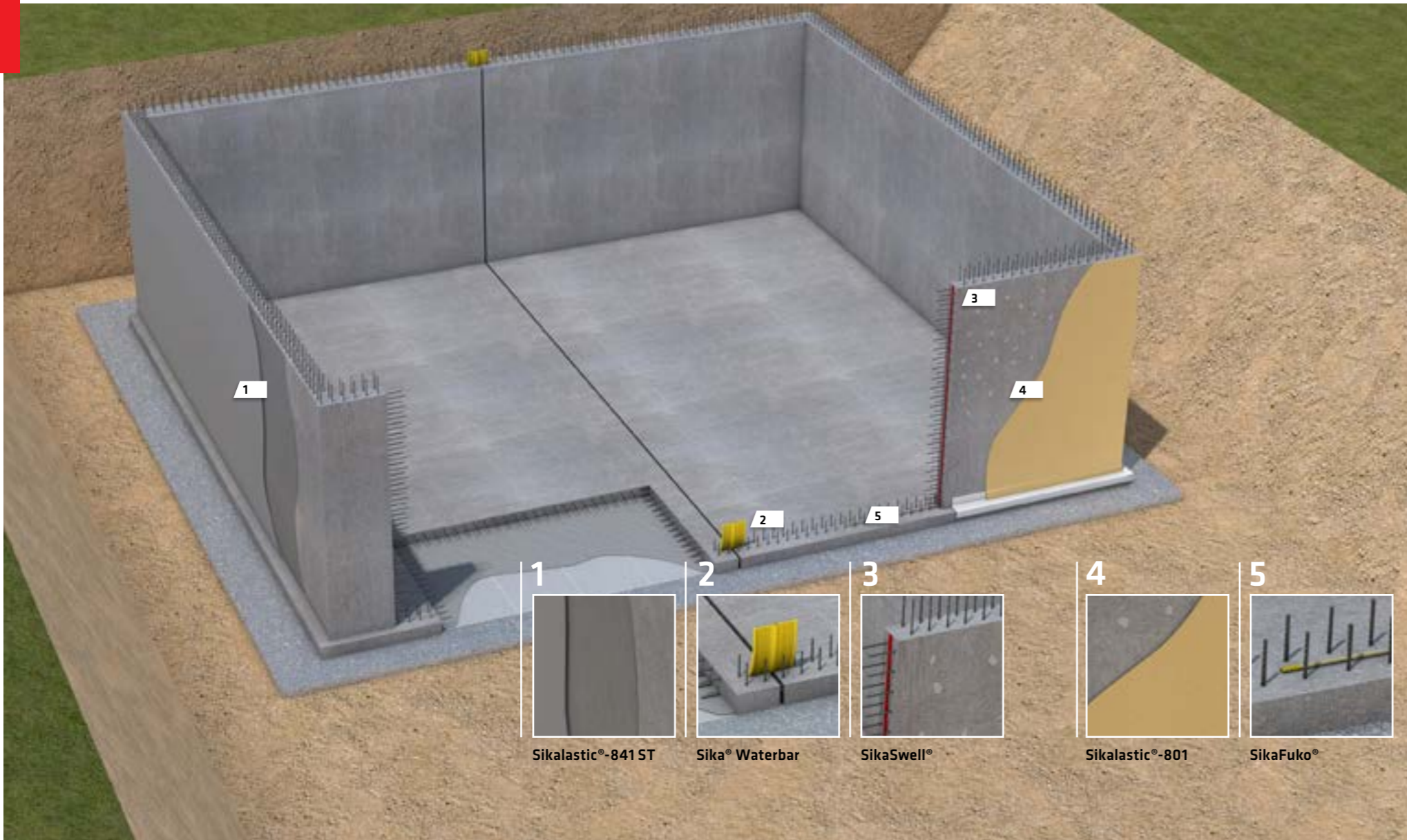
<b>Sikaplan® WP 1100 series</b>	Homogeneous and plasticized PVC sheet waterproofing membranes and gas-tight barriers for general use, loose laid with the membrane overlaps connected by heat welding.
<b>Sikaplan® WT 1200 series</b>	FPO sheet waterproofing membranes and gas-tight barriers for use against aggressive groundwater, loose laid with the membrane overlaps connected by heat welding.
<b>Sika® Waterbar WP/WT</b>	Cast-in-place external waterstops, based on PVC or FPO, connected with similar based sheet waterproofing membranes by heat welding, for compartmentalized waterproofing systems.
<b>Control- and Injection Sockets</b>	Preformed pieces based on PVC or FPO, connected with flexible injection pipes to allow access to compartments for the control of watertightness and injection in the event of leaks.
<b>Complementary sealing system solutions:</b>	
<b>Sikaplan® WT Tape 200</b>	Adhesive sealing tape based on FPO, compatible with Sikaplan WT sheet membranes for waterproofing the terminations of post-applied compartment systems.
<b>Sika® Dilatec E/ER</b>	Adhesive sealing tapes based on plasticized PVC, compatible to Sikaplan WP sheet membranes for water proofing terminations of post applied compartment systems.

# Sikalastic® LIQUID APPLIED MEMBRANE SYSTEM

## FAST TO APPLY, CRACK-BRIDGING, POLYURETHANE AND POLYUREA BASED LIQUID MEMBRANES.

Sika liquid applied membranes (LAM) are highly elastic and flexible polymeric systems, usually based on polyurethane or polyurea resins with excellent technical properties for high performance applications. These materials are applied on prepared / primed external concrete surfaces by spraying and provide excellent solutions for complex detailing.

Liquid applied membranes will also prevent any lateral water underflow in the event of local damage. Application below the base slab is done on a special fleece before the structural concrete slab is placed.



Sikalastic® polyurea systems are ideally suited to the waterproofing of podium deck slabs and compatible with Sika solutions for below ground waterproofing, thereby offering a one-stop-shop solution for waterproofing the entire structure.

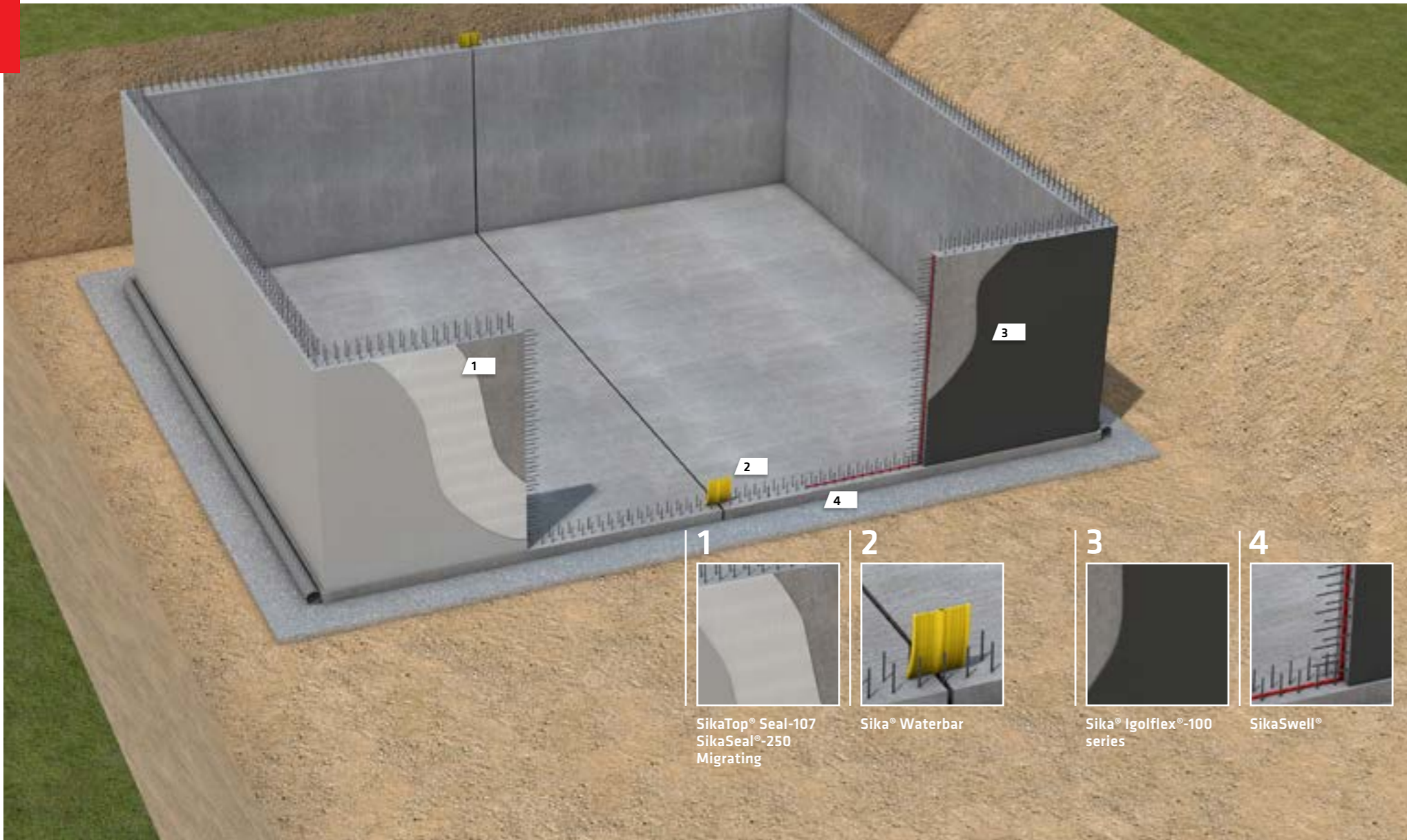
## SIKA PRODUCTS AND SYSTEM SOLUTIONS

<b>Sikalastic®-841 ST</b>	Highly flexible, very fast curing polyurea based, liquid applied membranes with very good chemical resistance for both vertical and horizontal areas. Also HAPAS approved for use in bridge deck waterproofing.
<b>Sikalastic®-8800</b>	Highly flexible, very fast curing, pure polyurea based, liquid applied membranes with very good chemical resistance for both, vertical and horizontal areas.
<b>Complementary products for Joint Sealing and Waterproofing:</b>	
<b>Sika® Waterbar</b>	Internal or external applied waterstops based on PVC, TPO or galvanised steel for construction and movement joints.
<b>SikaFuko® Injection hoses</b>	Injection hoses for construction joints and other details, with or without swelling strips, which can be used for sealing by injection and re-injection in the event of future movement etc.
<b>SikaSwell® Sealants and Profiles</b>	Range of hydrophilic profiles and gun applied sealants, designed for the sealing and waterproofing of construction joints and penetrations (e.g. pipe entries).
<b>Sikadur-Combiflex® SG System</b>	High performance, over-banding sealing tape system for post-sealing and waterproofing of construction and movement joints.

# SIKA WATERPROOF MORTARS AND BITUMINOUS COATINGS

**EXTERNALLY APPLIED SYSTEMS WITH OR WITHOUT CRACK-BRIDGING ABILITIES.** Sika waterproof mortars and bitumen based coatings are rigid or semi-flexible waterproofing products. They are supplied as ready to use solutions to seal against damp soil, seepage and percolating water. They must be pre-applied on suitable substrates under new structural concrete slabs and are generally post-applied externally on new walls.

They must be used in combination with appropriate joint waterproofing systems for construction and movement joints. Good external drainage with a permanent dewatering system is also necessary; normally using drainage pipes placed at or below the level of the base slabs to prevent any build-up of water pressure.



1 SikaTop® Seal-107  
SikaSeal®-250 Migrating

2 Sika® Waterbar

3 Sika® Igoflex®-100 series

4 SikaSwell®

## USE

- As a waterproofing system for Grades 1 to 2
- To protect structures against percolating water
- For limited ground conditions (no settlement, less aggressive environments, low water pressure)

## MAIN ADVANTAGE

- Cost efficient solution (Material + Application)
- Ready to use & easy to apply
- Provide additional concrete protection

## TYPICAL PROJECTS

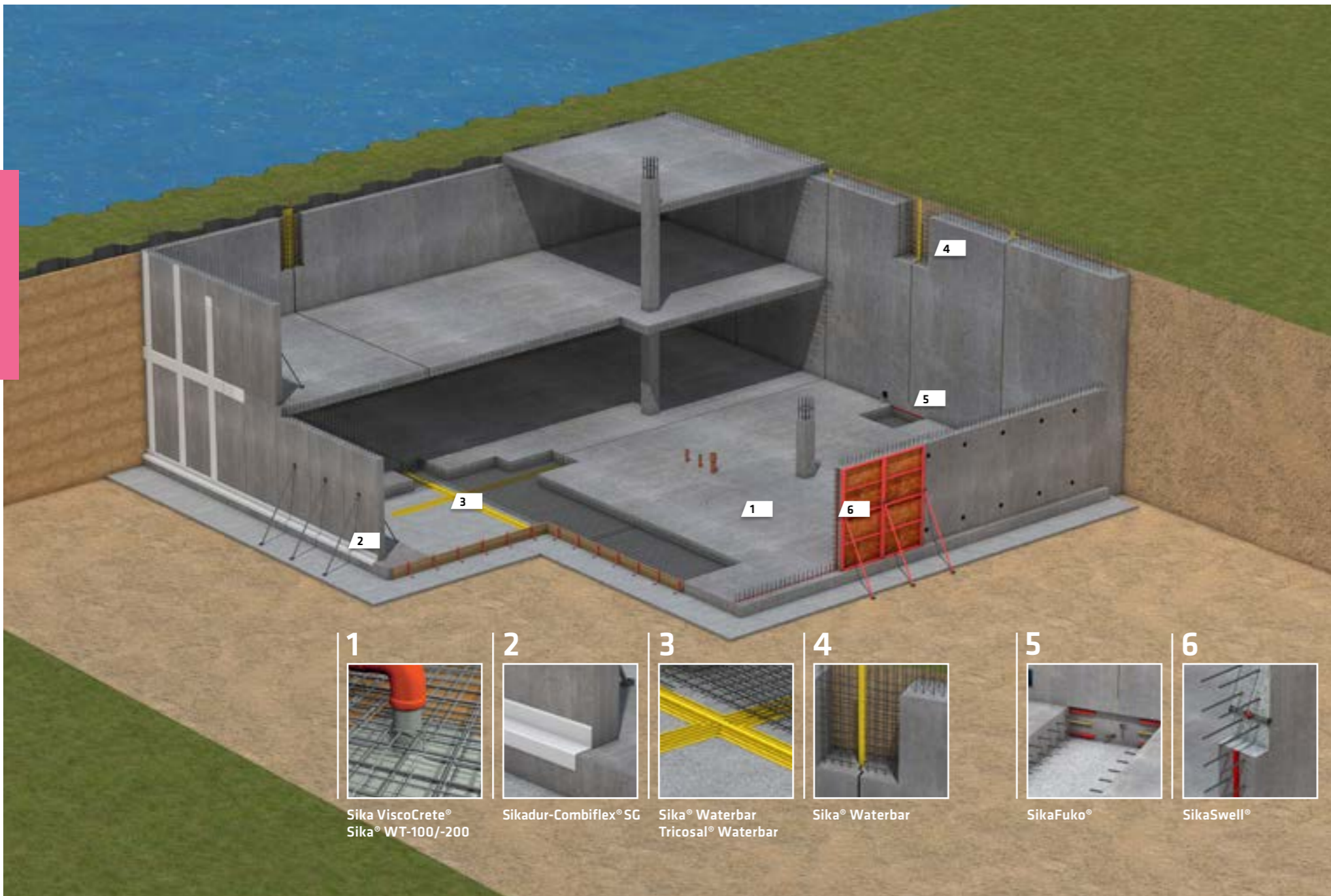
- Domestic applications
- Residential buildings
- Industrial buildings

<b>SikaTop® Seal-107</b>	2-component, polymer modified, rigid cementitious waterproofing mortar, internally and externally applied for full surface waterproofing and tanking.
<b>SikaSeal®-250 Migrating</b>	1-component, rigid and cement based active crystalline waterproofing slurry for internal and external applications on concrete.
<b>Sikalstic®-1K</b>	1-component, flexible, fibre reinforced mortar, based on cement modified with special alkali-resistant polymers. Ideal for waterproofing surfaces subject to flexural strain.
<b>Sika® Igoflex®-200 series</b>	2-component, flexible, solvent-free, fibre-filled bitumen based coatings, for use against water ingress and in contact with ground water (positive water pressure side). Also used for detailing in conjunction with other Sika systems.
<b>Complementary products for joint sealing and waterproofing:</b>	
<b>Sika® Waterbar</b>	Internal or external applied waterstops based on PVC, TPO or galvanised steel for construction and movement joints.
<b>SikaSwell® Sealants and Profiles</b>	Range of hydrophilic profiles and gun applied sealants, designed for the sealing and waterproofing of construction joints and penetrations (e.g. pipe entries).

# Sika® Watertight Concrete

## SIKA ARE THE MARKET LEADER IN CONCRETE ADMIXTURE TECHNOLOGY.

Combining this with our expertise in waterproofing has led to the development and evolution of the Sika® Watertight Concrete System, now the most widely used system of its type in the UK.



The Sika® Watertight Concrete System provides waterproofing for:

- Basements
- Lift pits
- Retaining walls
- Concrete façades

As well as for keeping water in, for example: swimming pools

Sika® Watertight Concrete complies with BS 8102:2009 Type B Construction.

The benefits of the Sika® Watertight Concrete System are clear:

- Time saved at design and construction stages as the need for external membranes with their complex detailing and installation is eliminated.
- Cost effective in comparison with membranes and other systems. Delivers maximum usable area to the occupier.
- Quality backed by Sika warranty, BBA certificate and a 60 years track record.
- Peace of mind for the client, specifier, contractor and end of user of the building. So confident are we in the performance of Sika® Watertight Concrete System that we offer a 15 year warranty.

## SIKA PRODUCTS AND SYSTEM SOLUTIONS

<b>SikaPlast® / Sika ViscoCrete®</b>	Mid and high range water reducing admixtures for reducing w/c ratio of concrete, in turn reducing the volume of capillary pores and improving rheology and consistence.
<b>Sika® Watertight Concrete Powder</b>	Pore-blocking admixture to block pores against water penetration.
<b>Sika® Control</b>	Shrinkage reducing admixture to limit crack formation throughout the hardening phase.
<b>Sikafume® range</b>	Additives based on pozzolanic silica fume that can be used to reduce the hardened pore volume of the concrete.
<b>Sika® Waterbar</b>	Internal or external applied waterstops based on PVC, TPO or galvanised steel for construction and movement joints.
<b>SikaSwell® Sealants and Profiles</b>	Range of hydrophilic profiles and gun applied sealants, designed for the sealing and waterproofing of construction joints and penetrations (e.g. pipe entries).
<b>SikaFuko® Injection Hoses</b>	Injection hoses for construction joints that can be used for sealing by injection and re-injection in the event of future movement etc.
<b>Sikadur-Combiflex® SG System</b>	High performance, over-banding sealing tape system for post-sealing and waterproofing of construction and movement joints.
<b>Tricosal® Waterbars</b>	Internal and external applied waterstops and flanging systems based on rubber for heavy duty joint waterproofing.

# CASE STUDIES

## Sika® Watertight Concrete

### ROYAL SHAKESPEAR THEATRE, STRATFORD-UPON-AVON

The grade II\* listed Royal Shakespeare Theatre in Stratford-upon-Avon has undergone a highly successful transformation that greatly enhances the live theatre experience of the audience. As part of the refurbishment, Sika® Watertight Concrete was used during the construction of the seven metre deep stage basement which will be used to create a scenic spectacle on the new main stage.

Due to its proximity to the River Avon, the water table on the site is high, and precautions were required to ensure the building remained watertight. To achieve this, Sika® Watertight Concrete was specified by Buro Happold in the construction of the stage basement, where the greater excavation depth meant the danger of water ingress was at its greatest. The Sika® Watertight Concrete system is BBA certified and has been keeping water in and out of structures for 50 years. It incorporates two powerful state-of-the-art Sika admixtures that will guarantee the future integrity of the building.

Smiths Concrete supplied 300 cubic metres of Sika® Watertight Concrete to John Doyle Construction who were responsible for the substructures and superstructures of the refurbishment. Buro Happold was the engineering consultancy for the project. Mace were the Construction Managers.

The design by Bennetts Associates Architects has sensitively combined aspects of the previous theatre into the new transformed building. At the heart of the redevelopment is a new 1,040+ seat thruststage auditorium which the stage projects into, and is surrounded on three sides by the audience. A new tower with a 32 metre high viewing platform has also been added, providing a visual landmark, with views across the town taking in historical landmarks including Shakespeare's birthplace.

The modern transformation of the Royal Shakespeare Theatre is a successful evolution of the original 19th and 20th century theatres that stood on the site.



### SCARBOROUGH SPA, NORTH YORKSHIRE

Sika® Watertight Concrete was used to keep water out in the lift and basement areas during a major £6.5 million refurbishment of Scarborough's historic Spa, a multi-purpose venue on the Yorkshire coast.

This Grade II listed Victorian building is situated on the site of the original spa house, which was erected in the early 1700's following the discovery of natural mineral waters, which it were claimed, had medicinal properties. Since then, use of the natural water wells declined and finally ceased, but the Victorian Spa building itself has continued to evolve, and today is an outstanding venue for conference, exhibition, entertainment and banqueting facilities.

The Sika® Watertight Concrete system was used to protect the basement areas of the refurbishment, which includes the addition of new dressing rooms and a new hydraulic lift pit. Hanson Concrete supplied 200 cubic metres of Sika® Watertight Concrete, which was chosen for the below ground structures to ensure a dry and comfortable environment. This innovative system incorporates state of the art Sika admixtures to prevent water penetrating through the concrete.

This guaranteed system is BBA certified and has a successful track record going back 50 years.

To complete the system, construction joints were sealed with the SikaSwell® jointing system, which consists of joint sealing profiles that expand on contact with water to seal any voids between adjoining concrete slabs.

The Grand Hall, which is at the heart of the Spa, has now been returned to its original Victorian splendour with theatre seating for nearly 2000 people, or alternatively, it can be cleared to give 823 square metres of exhibition space. The refurbished Spa, is one of the largest multipurpose conference and entertainment venues on the North East coast, offering a full range of conference, hospitality and entertainment facilities.

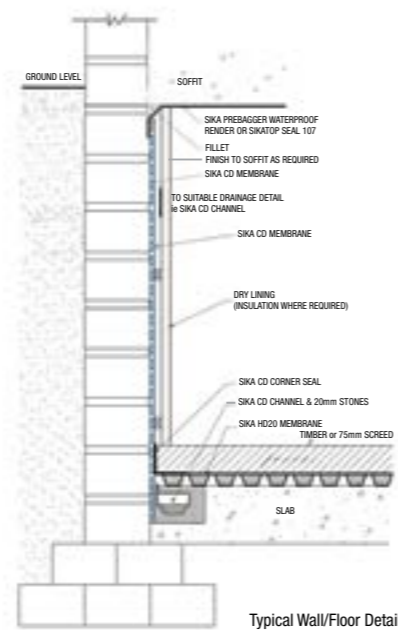


# Sika® C D CAVITY DRAINAGE SYSTEM

**Sika® Cavity Drainage System CREATES A WATER MANAGEMENT SYSTEM TO CONTROL WATER AFTER IT HAS PENETRATED THE STRUCTURE.** Utilising a high density polyethylene internal drainage membrane, the system is installed loose laid in flooring applications and attached to the wall with surface plugs in vertical installations.

The system directs penetrating water into a drainage system and a collection sump before using a pump to discharge water from the building. Cavity drain provides protection from the ingress of water, vapour and gases. Suitable for above and below ground usage.

The membranes are fixed to the walls using special plugs with minimum surface preparation required to the substrate. Once the membrane has been fitted, wall surfaces can be dry lined or plastered and the floors can be screeded.



Typical applications include:

- Walls and floors of basements
- Cellars

#### ADVANTAGES

- Can be used where the substrate does not have the strength to resist stresses caused by water pressure
- Can accommodate minor movements within the structure
- Limited surface preparation required
- Acts as a vapour barrier
- Can be used to grades 1-3 according to BS 8102:2009
- Suitable for high water table according to BS 8102:2009

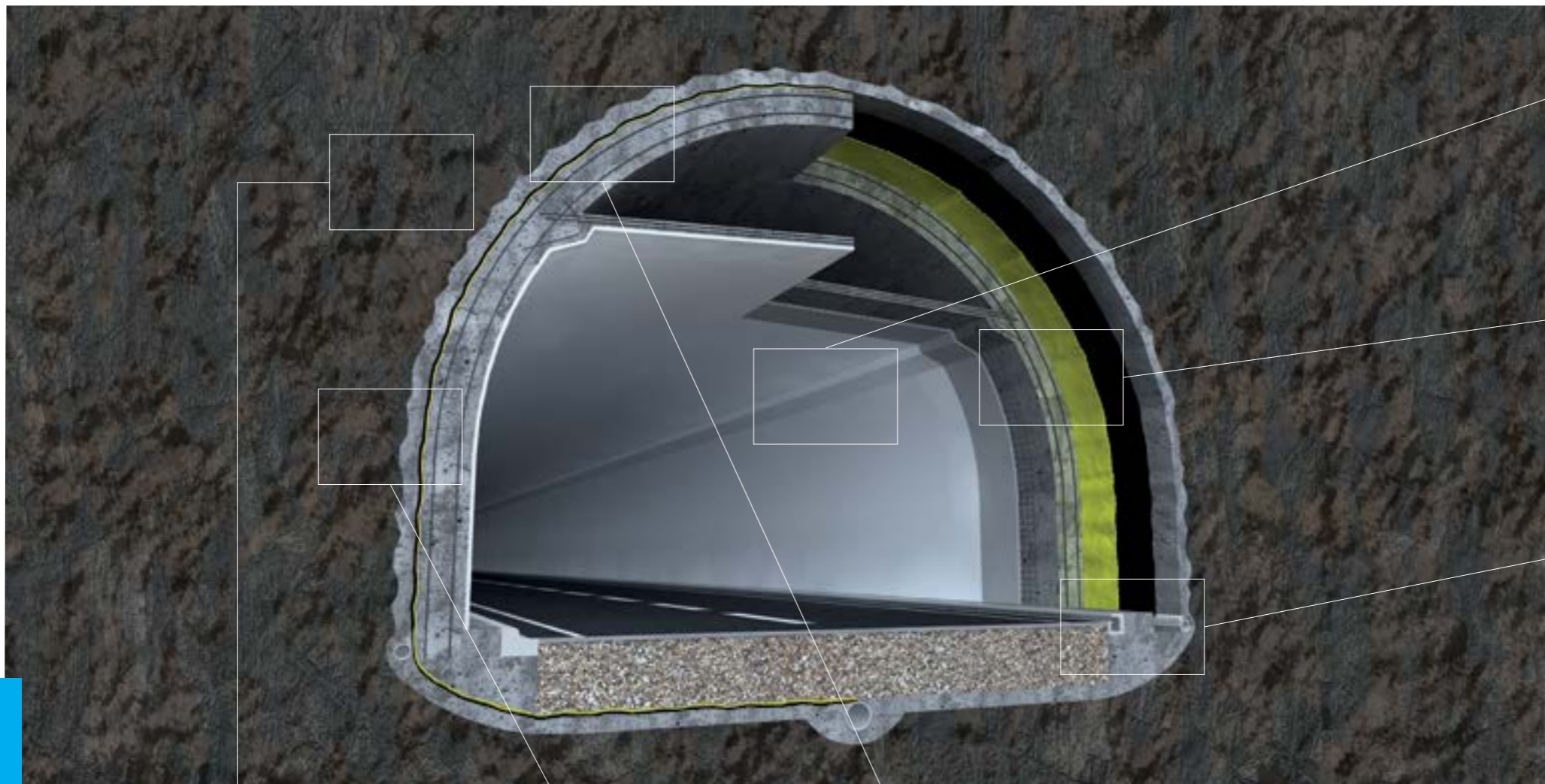
Regular maintenance of the system including pumps is required, therefore the design of the structure should include access for maintenance.



# FLEXIBLE WATERPROOFING OF TUNNELS

**TUNNELS ARE BUILT WITH A SERVICE LIFE OF OVER 100 YEARS**, which means that standards for tunnel construction must be high, in particular those involving sealing and waterproofing systems.

A tunnel seal has the task of protecting the tunnel construction against damage from moisture or the unintentional entry of water as well as the danger posed by aggressive water or soils and the effects of chemicals. Thus the reliable functioning of a seal is of particular significance in the case of traffic tunnels, which are not easily accessible for subsequent repairs after construction.



Wall protection  
Sikagard®-Wallcoat



Flexible waterproofing  
Sikaplan® membrane



Specialties  
SikaGrout® mortars  
Sikadur® epoxy adhesives

Joint sealing, crack sealing  
Sikadur®-Combiflex® System  
Sika® Waterbar  
Sikaplan® WP drainage angle



Rock stabilization with  
Sika® Injection resins



Sprayed concrete  
SikaCem®-Gunite®



Tubbing/Pre-cast-concrete elements  
Sika® ViscoCrete® SCC  
Concrete admixture technology

As this is a highly specialised area of waterproofing, a separate document entitled 'Flexible Waterproofing of Tunnels with Sikaplan® Membranes' has been produced.

# CASE STUDIES

## Sika Tunnelling and Bridge Deck Waterproofing

### GOTTHARD RAILWAY BASE TUNNEL, SWITZERLAND

Some 90 years ago Sika celebrated its first successes with the challenge of waterproofing the old Gotthard railway tunnel for impending electrification. In the present Gotthard Base Tunnel, at 57 km the longest tunnel in the world, challenges comparable to those of 90 years ago have emerged, while entirely new ones have also come to light. Sika solutions position the company at the fore.

The Gotthard Base Tunnel will be something special, an innovation in tunnel construction. The tunnel burrows through one of the highest alpine mountain ranges, the Gotthard. Beneath the highest mountain peaks the tunnel courses some 2000 meters below the rock and at its crown will lie only about 550 meters above sea level. In this it revolutionises railway traffic between the North and the South in Europe. The new route can be utilised by both massive freight trains and modern high speed passenger trains, such that the journey time for passenger trains between Zurich and Milan shortens by an hour. But it is not only the dimensions that present great challenges for the tunnel builders; above all the climatic conditions and the structural specifications make this the structure of the century: Service life of the concrete of 100 years | High temperatures below ground (30 - 40°C) | High humidity (above 80%) | Long transport distances for fresh concrete (up to 30 km) | Long workability for fresh concrete (up to 6 hours) | Prevalent mountain water, corrosive for concrete

With Sika admixtures the concrete in the Gotthard Tunnel can be adapted continuously to the respective requirements. In particular for shotcrete the tunnel builders need highly specific formulae. Water reducers such as Sika® ViscoCrete®, set retarders such as SikaTard® and pumping agents such as SikaPump® must be added to the concrete so that it can be transported over the long distances in the tunnel and thereby constantly remain workable. In general concrete begins stiffening after roughly half an hour. In the Gotthard Tunnel however, the concrete needs to remain fluid for up to six hours, since the concrete producers first load the concrete from the production works outside the tunnel onto trains, with which it is transported to the borehole location, where the tunnel builders must then still process it onsite.

Upon arrival at the borehole, Sigunit® is added. The set accelerator ensures that the freshly applied concrete rapidly stabilises the newly excavated tunnel cavity. Deep within the mountain the tunnel boring machine drills into the stone around the clock. Directly behind the emerging cavity, the machine has a steel ring which supports the overlying stone for a distance of a few meters. After this, high-grade shotcrete must be applied immediately, because as the miners penetrate into the mountain meter for meter, they are protected against the collapse of the overlying stone only by the layer of shotcrete of a mere few centimeters.

For Sika, the structure of the century in the Gotthard is also the project of the company's first century. With high-grade Sika admixtures and spraying machines. Sikaplan® waterproofing membranes are being affixed to this by SikaBau. The concrete shell is then being constructed on this interior, in which Sika admixtures are also contained.



### BELTON LANE BRIDGE, GRANTHAM, LINCOLNSHIRE

Belton Lane Bridge, located in Grantham UK, crossing Whitham River, had an old bituminous sheet waterproofing layer overlaid with an old worn asphalt concrete as base and wearing course. Due to the bad conditions ingress of water started to attack the concrete of the walk ways and the road. The total surface to be refurbished was 220m<sup>2</sup>.

Lincolnshire County Council decided to take away the whole existing system, including the bituminous sheets, level out the slightly attacked concrete surface and install a crack bridging, fast curing, spray applied waterproofing membrane, covered with an asphalt concrete overlay and wearing course, tested and certified according the BBA-HAPAS standard.

Sika offered the fast curing, already ETA 033 certified bridge deck waterproofing system. The system consists of the fast setting Sika® concrete primer, the spray applied, fast curing Sikalastic®-841 ST membrane and the tack coat to the asphalt overlay made of Sika® Concrete Primer broadcast with Sikalastic®-827 LT hot pelt pellets. This system is fully bonded to the concrete substrate and the asphalt overlay, and it provides excellent adhesion and shear strength.

The project has also been used as the trial bridge for the BBA-HAPAS Certificate. A BBA Inspector was on site all the time to evaluate the work and the performance.



# WATERPROOFING FOR BRIDGE DECKS

**TO INCREASE THE DURABILITY OF REINFORCED CONCRETE BRIDGES**, all concrete movement and construction joints, plus the bridge decks have to be waterproofed to prevent serious damage to the concrete, or to the embedded steel reinforcement. Due to dynamic loading, the bridge decks must be protected with elastic, crack-bridging systems to accommodate any movement and maintain the protection.

## ADVANTAGES

- Elastic, crack-bridging properties, especially at low temperatures
- Resistance to chlorides and automotive chemicals such as fuel, oils and hydraulic fluids.
- Easy to install and accommodate variations in level and substrate conditions
- Fast application to reduce traffic closure times.



## SIKA SOLUTIONS FOR BRIDGE DECK WATERPROOFING

Durable waterproofing systems for concrete and steel bridge decks:

- For concrete bridge decks under hot poured asphalt: System consisting of Sika® Ergodur® epoxy overlay and Sikalastic® liquid applied membrane
- For steel bridge decks under hot poured asphalt: System consisting of SikaCor® HM Primer and SikaCor® HM waterproofing layer
- For steel bridge decks without asphalt topping: System consisting of SikaCor® HM Primer and Sika® Elastomastic® TF waterproof wearing layer performance of Sika® Watertight Concrete System that we offer a 15 year warranty.



## SIKA SOLUTIONS FOR ELASTIC JOINT SEALING

High Performance watertight joint sealing systems for use on bridge decks, parapets and other elements:

- For facade and parapet joint waterproofing: Sikadur® Combiflex® SG system
- For bridge deck and deck waterproofing edge terminations: Sika® Dilatec® B, R and E edge systems
- For facade joint waterproofing: Sikaflex® joint sealants



## SIKA SOLUTIONS FOR WATERPROOFING CRACKS

Structural bonding and flexible watertight injection systems for crack sealing in concrete structures:

- For the surface sealing of bridge decks:
- Flexible polyurethane and acrylic resin based injection systems – Sika® Injection® systems
- For structural cracks and void repair: Sikadur® and Sika® Injection® low viscosity, epoxy resin based systems



# TANK LININGS

Applications such as potable water tanks, sprinkler tanks, attenuation tanks, clean and dirty water systems require a specific approach to keeping water in and protecting groundwater against pollution.

## POTABLE WATER TANKS/PITS AND PONDS

Potable water tanks and reservoirs can be protected in various ways including the use of Sikaplan® FPO sheet membranes and Sikalastic® spray applied systems. Joints and cracks in the structure are commonly sealed using the Sikadur®-Combiflex® SG system (see page 45). All solutions offered are WRAS and DWI approved.



## PRIMARY AND SECONDARY SEDIMENTATION TANKS

Retention pools, tanks of sewage water or chemical effluents require chemically resistant linings for protection of the sub-soil and groundwater against pollution. Following the specific requirements Sikaplan® sheet membranes, Sikalastic® liquid membranes based on polyurethane or polyurea or Sikagard® epoxy coatings may be chosen.



OTHER APPLICATIONS

OTHER APPLICATIONS

# WATERPROOFING FOR BALCONIES AND WALKWAYS

**BALCONIES AND WALKWAYS ARE EXPOSED TO THE ELEMENTS AND REQUIRE ADEQUATE WATERPROOF PROTECTION** to ensure they remain in good condition and suitable for use by the building's occupants. With over 15 years experience in the Balcony market Sika Liquid Plastics has developed a range of systems specifically designed to protect balconies and walkways against the challenges presented by the elements, whilst providing an aesthetically pleasing finish. The systems incorporate our unique waterproofing membrane Decothane Balcons – a high performance waterproofing system that utilises a moisture-triggered curing system. Our balcony systems are available with a range of guarantees and functional topcoat options designed to suit your project/client requirements.

Our balcony systems offer a complete solution for your balcony requirements, as well as exhibiting many key features:

- Up to 20 year guarantees available
- Excellent adhesion
- Waterproofing achieves high tensile strength
- Elastomeric – allowing for greater thermal movement
- Hard wearing
- Skid inhibiting
- Seamless technology – no seams or joints
- Vapour permeable
- UV resistant

PRODUCT	GUARANTEE	SUBSTRATES
Balcony 10 Waterproofing	10 years	Waterproofing and trafficable system for concrete walkways, balconies and terraces
Balcony 15 Waterproofing	15 years	Waterproofing and trafficable system for concrete walkways, balconies and terraces
Balcony 10 Waterproofing	20 years	Waterproofing of concrete walkways, balconies and terraces that are to be tiled or buried
Balcony Trafficable Coat		Trafficable system for concrete walkways, balconies and terraces



OTHER APPLICATIONS

OTHER APPLICATIONS

# REPAIR AND REFURBISHMENT SOLUTIONS

**THE BASIS OF EVERY CONCRETE BASEMENT IS A SOLID AND SOUND CONCRETE STRUCTURE.** Proper maintenance of the reinforced concrete structure is essential in order to guarantee a prolonged design life and to ensure the longevity of any waterproofing system.

This includes:

- Protection of the steel reinforcement
- Repair of damaged and deteriorated concrete
- Protection of exposed concrete surfaces against mechanical, chemical and physical attacks
- Strengthening of reinforced concrete structures which are too weak to carry the required load

Successful concrete refurbishment starts with a detailed condition survey to identify the root causes of degradation. After the assessment, the appropriate repair and protection strategy and repair works can be defined according to local standards and manufactured and tested in compliance with European Standard BS EN 1504.

## Sika®-1 Pre-Bagged

The Sika®-1 Pre-Bagged Waterproofing System fully protects above and below ground structures from water ingress, eliminating the need for the maintenance of any internal drainage or pumping system associated with some other solutions. Suitable for virtually any application, the system provides an effective water-tight seal for structures that must keep water out;

- Basements
- Underground car parks
- Swimming pools, water tanks, etc - structures that must retain water

This system can be combined with a range of complementary products for a comprehensive watertight solution. The pre-bagged waterproofing range consists of a render system for use on walls and overhead and a screed system for use on the floor.

### ADVANTAGES

- Withstand high water pressures
- Bonds to the substrate
- Hard wearing surface
- No ongoing maintenance
- Follow contours of structures
- 100 year track record
- Can be used to achieve Grades 1-3 according to BS 8102- 2009
- Suitable for high water table according to BS 8102-2009



# SOLUTIONS FOR LEAKS AND CONSTRUCTION DAMAGE

## LEAKING STRUCTURES

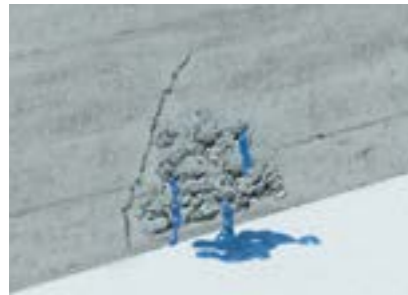
Water can leak into and out of structures. Reasons for this can be cracks, failed joints and even through permeable substrates. Once identified, if not treated, further problems can occur including the corrosion of reinforcement, thus resulting in the consequential loss of a usable area within the structure. Sika produce a range of resin injection systems designed to stop water ingress through leaks.

## CONCRETE DAMAGE

Damage can occur to the concrete in many ways but primarily through incorrect detailing, inadequate or untimely concrete compaction, or by accident. Sika produces a full range of concrete repair systems, which are compatible with all Sika waterproofing systems.

## CRACKS/HONEYCOMBING

The terms "watertight" and "vapourtight" do not mean "crack-free". Cracking can always occur in concrete in its plastic or in its hardened state, due to the stresses imposed. Sika has a complete range of products and systems for the repair of "cracks" and "honeycombing" in concrete structures.



SEALING AND WATERPROOFING OF CRACKS AND VOIDS

Closing, sealing and flexible bridging of leaking cracks and honeycombing or voids in new and existing structures:

### Sika Injection-101

Fast-foaming, low-viscous polyurethane injection foam for temporary water-stopping

### Sika Injection-201

Low-viscous, flexible polyurethane injection resin for permanent waterproof sealing

### Sika InjectoCem-190

Two-component injection grout based on microfine cement



WATERPROOFING OF CONSTRUCTION JOINTS

For sealing construction joints in a watertight structure, Sika provides a full range of products and systems:

### Sika Injection-29

Low-viscous, flexible polyacrylate injection resin with a high solids content

### Sika Injection-201

Low-viscous, flexible polyurethane injection resin for permanent watertight sealing even in wet conditions

### Sika InjectoCem-190

Two-component injection grout based on microfine cement for waterproof sealing of voids and non-moving cracks in the structure



SURFACE SEALING AND WATERPROOFING OF CONCRETE STRUCTURES

Remedial surface sealing by curtain injection of surface defects in below ground concrete structures:

### Sika Injection-304

Flexible, very low-viscosity and very quickgelling polyacrylate injection gel for permanent watertight sealing. The material reacts to form a waterproof, flexible but solid gel with good adhesion to both dry and wet substrates.

# SEALING OF MOVEMENT AND CONSTRUCTION JOINTS

**A HIGH PERFORMANCE JOINT SEALING SYSTEM CONSISTING OF THE Sikadur®-Combiflex® SG SEALING STRIPS AND Sikadur® EPOXY ADHESIVE.** This system is renowned worldwide for proven performance in sealing difficult joints and/or cracks in all types of watertight and retaining structures e.g. reservoirs, and can be applied both internally and externally to meet the specific project's requirements.

## ADVANTAGES

- Easily adaptable to the construction programme.
- Easy to adapt to complicated construction details.
- Simultaneous additional crack repairs are possible.
- Damage or leaks can be repaired externally or internally.
- Easy to control the application because it is visible.
- Can be used on various substrates including concrete, brick and steel

## THE SIKA SYSTEM

The selection of the appropriate width and thickness of the Combiflex membrane strip is dependent on the joint requirements and exposure:

- Sikadur®-Combiflex® SG-10 strip thickness of 1 mm for low mechanical stress.
- Sikadur®-Combiflex® SG- 20 strip thickness of 2 mm for higher mechanical stress
- The Sikadur®-31 adhesive is available in both normal and rapid hardening grades and also a grade approved for contact with drinking water



# CASE STUDIES

## Sika® Waterproofing Systems

### ASHMOLEAN MUSEUM, OXFORD

Built in the 1670's and the world's first university museum, the Ashmolean Museum, part of Oxford University, recently underwent redevelopment to make it suitable for modern visitors. Sika®-1, from renowned manufacturer of building materials Sika, was chosen to provide superior waterproofing to basement areas and protect the priceless artefacts they contain.

All but the original, Grade 1 listed elements of the structure needed to be demolished and replaced with a stylishly designed and fit for purpose new building. The redevelopment doubled the gallery space of the museum and created dedicated conservation and education facilities. Given the Ashmolean's collection of rare objects, it provides excellent environmental control.

Famed architect Rick Mather designed the structure, including its 4000m<sup>2</sup> basement. To provide the exacting standards environmental control that the curators and managers of the museum required, consulting structural engineers Dewhurst MacFarlane and Partners specified Sika, safe in the knowledge its waterproofing system certified full protection.

The basement's vast size meant the system required a total of 250 tonnes of Sika pre-bagged mortar, combined with 27,500 litres of Sika®-1. The provision of materials had to fit in with tight site deadlines, to which Sika demonstrated its ability to supply large specifications under pressure.

Over the reinforced concrete structure a layer of Sika®-1 Spritz Mortar was applied. This was followed by a second and third layer of Sika®-1 Render and Finishing Mortar to the walls and, equally, a second and third layer of Sika®-1 Screed Mortar to the floor – creating a three layer system of protection.

To ensure no moisture permeated that structure, the specialist contractor applied Sika® EpoCem®, an epoxy cementitious combination material, which acts as a surface mounted DPM when used in combination with Sikadur® 32. This was essential to maintain the integrity of the artefacts held within the basement. The product also heavily reduced time on the project. Once applied on top of the mortar, it sped up drying times, allowing work to proceed ahead of schedule.

The waterproofing was specified to BS8102: 1990 Grade 4 – the highest recognised standard of waterproofing protection. This required a high level of technical ability to apply the Sika system. To ensure these requirements were met Sika provided the contractor with comprehensive technical and practical training for several of its staff members.

The main contractor and client stipulated that as many sustainable products should be used on the project as was possible. Sika packaging complied with this policy, as it is all sustainably sourced.



### THE BUCKLEY BUILDING, LONDON

Basement waterproofing at the buckley building was central to the redesign and refurbishment of this prime four storey development. The incorporation of the proven Sika®-1 Structural Waterproofing System which was used to protect the building from the basement up and ensure the structure is watertight for years to come.

Sika supplied a range of high performance structural waterproofing products as part of the £15 million refurbishment and conversion of a 100,000 sq ft office building in the heart of the Clerkenwell Conservation Area.

Sika®-1 Pre-Bagged Structural Waterproofing - Internal waterproofing of below ground structures to meet the requirements of BS8102 – 2009 Grades 1 - 3 was used.

Combining innovation in product development, the highest standards of manufacturing and unrivalled technical expertise, Sika's range of waterproofing systems will meet and exceed client expectations, industry best practices and building regulations and legislation. Certified by the British Board of Agrément (BBA) to last the life of the building, Sika's waterproofing systems provide exceptional standards of durability and reliability. And to make the specification of reliable, high performance waterproofing solutions even easier, Sika has recently launched SikaSpec, found at [www.sikaspec.co.uk](http://www.sikaspec.co.uk), which comprises an innovative online tool used for the creation of comprehensive waterproofing specifications. Designed to provide a single point of reference for the easy and correct specification of waterproofing solutions, the step by step process allows the user to choose from a series of options to create a bespoke waterproofing specification including drawings and NBS clauses.

For complete peace of mind, Sika, also offers a comprehensive product warranty when the application is undertaken by a Sika Registered Contractor. This nationwide scheme offers total quality control – from product to service to installation – and grants specifiers, contractors and end users complete peace of mind with a wholly professional service to match the exceptional technical service.

With the help of a comprehensive range of waterproofing products from Sika, the former printing works has been converted into a stunning office building whilst at the same time retaining its industrial heritage and offering long term performance for many more years to come.





# SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:



WATERPROOFING



CONCRETE



REFURBISHMENT



DISTRIBUTION



SEALING AND BONDING



FLOORING



ROOFING



INDUSTRY

## FOR MORE INFORMATION ON WATERPROOFING:



### WHO WE ARE

Sika Limited is part of the global Sika Group, specialising in the manufacture and supply of chemical based products for construction and industry. Sika is a world-leader in its field with subsidiaries in more than 80 countries, 15,200 employees, and annual sales of CHF 4.8 billion (£3.3bn). We are also committed to providing quality, service, safety and environmental care.

In the UK, we provide market-leading solutions for concrete, waterproofing, roofing, flooring, refurbishment, sealing & bonding, and industry, and have manufacturing sites in Welwyn Garden City, Preston, and Leeds with 700 employees and a turnover of £190 million.

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 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 proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request.



### SIKA LIMITED

Head Office  
Watchmead, Welwyn Garden City  
Hertfordshire, AL7 1BQ  
United Kingdom

### Contact

Phone +44 1 707 394444  
Fax +44 1 707 329129  
E-Mail enquiries@uk.sika.com  
www.sika.co.uk

### SIKA IRELAND LIMITED

Sika House  
Ballymun Industrial Estate  
Ballymun, Dublin 11  
Ireland

### Contact

Phone +353 1 862 0709  
Fax +353 1 862 0707  
E-Mail info@ie.sika.com  
www.sika.ie

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