Sika Solutions for Watertight Concrete
Sika is a global company with an enviable reputation for innovation, quality and experience. This has led to a market leading position in many construction fields, in particular, waterproofing of buildings and structures. Our complete range of below ground waterproofing solutions includes:

- **Sika® Watertight Concrete System**
- **Sika® Membrane Systems (SikaProof® and Sikaplan®)**

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

- Time saved at design and construction stages as the need for complex detailing and installation is eliminated
- Cost effective in comparison with other systems
- Delivers maximum usable area to the occupier
- Quality backed by a 50-year track record
- Peace of mind for the client, specifier, contractor, and end of user of the building

Sika is a global 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.

The Sika® Watertight Concrete System offers a comprehensive solution for watertight structures. The system consists of concrete that has been specially modified with Sika admixtures to produce waterproof concrete; and carefully selected waterstops for construction and movement joints. Watertight concrete structures can be designed to keep water in or out or both. The need to maximize design flexibility has led clients and specifiers to look below ground as an alternative, whether for basement parking or a habitable environment.
The Sika® Watertight Concrete System complies with numerous national standards throughout the world, with local approvals in place with eminent establishments such as the British Board of Agrément. It is suitable and has been used extensively in all levels of protection of below-ground structures. Sika welcomes involvement in a project at the earliest opportunity. Using our experience and expertise we can bring significant benefits to the project. Specifiers and contractors have easy access to standard application CAD drawings, specification service and technical help through our local representatives.

Detailing such as structure thickness, construction joints, pour sequences, aspect ratios, service entries and re-entrant corners should be discussed with your Sika representative.

If the assessed risks are deemed excessively high, thought should be given to the use of a dual system by combining the benefits of Sika® Watertight Concrete and a Sika® Membrane System.

The Sika® Watertight Concrete System was used to construct the six level basement of this extraordinary building which houses conference facilities, archives, main auditorium, technical support rooms and a car park. The Sika® Watertight Concrete System was chosen for its proven track record as well as offering demonstrable time and cost savings versus external tanking systems. All construction joints and other details such as service entries through the concrete were sealed using the SikaSwell® joint protection system.

The Sika® Watertight Concrete System can be used for all types of below-ground structures, including habitable basements, car parks and areas for business use. As with all below-ground structures, adequate ventilation and air conditioning should be appropriate to the intended use.

<table>
<thead>
<tr>
<th>Keeping water OUT</th>
<th>Keeping water IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basements</td>
<td>Swimming pools</td>
</tr>
<tr>
<td>Habitable basements</td>
<td>Water retaining structures</td>
</tr>
<tr>
<td>Parking garages</td>
<td>Dams</td>
</tr>
<tr>
<td>Utility/plant rooms</td>
<td>Water structures</td>
</tr>
<tr>
<td>Tunnels</td>
<td>Waste water treatment structures</td>
</tr>
</tbody>
</table>
Principles in Practice

Careful selection of key technologies and products is vital to meet the demands expected of a watertight structure. Sika has the unique position of being able to provide intelligent solutions with the most advanced technologies from a comprehensive range of products. This ability ensures that all system components are compatible.
Despite the apparent density of concrete it can be described as a porous material that allows the passage of water through a structure of capillary pores. These capillaries are the voids created by the water in the concrete that is necessary to start the chemical reaction for hardening known as hydration.

*Sika*® Watertight Concrete incorporates *Sika*® ViscoCrete® superplasticiser technology which reduces the water cement ratio (capillarity) whilst producing a highly workable concrete to aid placing and compaction. The lowering of the water cement ratio reduces the volume, size and continuity of the capillary structure.

The remaining capillary pores are then blocked using a product from the *Sika*® WT range to ensure the concrete is watertight.

Due to the design of *Sika*® Watertight Concrete, early age and ultimate strength as well as durability are enhanced.

The *Sika*® Watertight Concrete System should be obtained from a ready-mixed concrete supplier with a recognized third party accreditation.

Products are available in the *Sika*® WT range that combine *Sika*® ViscoCrete® and *Sika*® WT technologies for ease of production.

Good site practice is the key to ensuring the concrete technology from *Sika* and the correct structural design come together to achieve a watertight structure.

- Planning of concrete pours
- Formwork
- Placement and compaction
- Curing

Efficient curing of concrete is essential in any situation. It helps reduce the risk of cracking and enhances durability. A high quality spray on curing membrane is recommended.

On Site Support

*Sika* supports the specifier and contractor from design through to completion. As well as technical support, the provision of standard CAD drawings and other documentation, *Sika* personnel are on hand to advise and assist the ready-mix concrete producer and the contractor at every stage of the project. *Sika* technical staff will provide training to site personnel in order to familiarise them with the *Sika* products they will be using. They will visit the site regularly to ensure compliance with the specification.

Concrete Practice

The *Sika*® Watertight Concrete System enabled A P Arcon Construction to construct an exciting partly subterranean mansion, on a strip of previously vacant land between two existing buildings in London. The main living, entertainment and swimming pool areas are underground.

Concrete Technology

Project reference

- Mix design approval
- Pre-start meetings
- Site training
- Site support throughout
- Inspection of work including joints
- Final inspection

Photograph below

Project: Underground Mansion, London
Architect: Jones Lamball Architects

The *Sika*® Watertight Concrete System enabled A P Arcon Construction to construct an exciting partly subterranean mansion, on a strip of previously vacant land between two existing buildings in London. The main living, entertainment and swimming pool areas are underground.
Sika Watertight Concrete System Components

Sika watertight concrete admixtures

- **Sika® WT-100** series
  Sika pore blocking technology
- **Sika® WT-200** series
  Sika crystalline technology
- **Sika® Viscocrete®**
  HWR / Superplasticizers
- **SikaPlast®**
  MWR / Mid-range water reducers

Joints and detailing

**Construction joints (non-movement)**

- **SikaSwell® A** profiles
  SikaSwell® A-2005 and A-2010 are sealing profiles that swell in contact with water. SikaSwell® S-2 is used to adhere the SikaSwell® A profiles.

**Servcie entries**

- **SikaSwell® A Profiles**
  SikaSwell® A-2005 and A-2010 are sealing profiles that swell in contact with water. SikaSwell® S-2 is used to adhere the SikaSwell® A profiles.

**Movement joints**

- **Sika® Waterbar**
  Sika® Waterbar are used to waterproof expansion (movement) and construction (non-movement) joints.

**Formwork tie bar hole sealing**

- **Sikadur®-31**
  Sikadur®-31 is used to seal formwork tie bar holes against water ingress.

**Curing**

- **Sika® Antisol®**
  Sika® Antisol® is a spray-applied membrane for curing, hardening and sealing.

Additional components

**Construction Joints (non-movement)**

- **SikaFuko® ECO-1**
- **Sika Fuko® VT-1**
  SikaFuko® are injectable hoses for sealing (and if necessary resealing) construction joints in watertight structures against water ingress. SikaFuko® may be used in combination for added security with SikaSwell® A profiles or Sika® Waterbar for post injection should significant movement occur in the future. To seal the joint SikaFuko® can be injected with a suitable Sika injection material.

**Construction and movement joints**

- **Sika® Waterbar**
  Sika manufactures and supplies a full range of Waterbars to suit every application.

**Crack sealing (non-injection)**

- **Sikadur-CombiFlex® SG**
  Sikadur-CombiFlex® SG System is a high performance joint and crack sealing system. The system allows for variable and high levels of movement in one or more directions.

**Project reference**

Sika® Watertight Concrete has been used extensively on Queens West Building 4, a 38 story residential high rise building, situated on the East River Waterfront in Queens, New York City. Sika® Watertight Concrete was utilized in the construction of the exposed concrete walls and concrete garages that were in the vicinity of the East River to prevent any possible penetration of water to the interior of the building.
Sika is a leading Swiss company, globally active in specialty chemicals. Our local presence worldwide links us directly with customers and ensures the success of Sika and its partners. Every day highly motivated people strive to provide the best customer service.

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