



Multi-Storey and Underground Car Parks Sika® – Complete Solutions for Parking Structures



Innovation & Consistency | since 1910





Multi-Storey and Underground Car Parks

Sika® – Complete solutions for new build and refurbishment of parking structures

You are looking for a partner who can offer complete solutions for the new build and refurbishment of your car park structures? With its wide portfolio Sika can be the right partner to help protect your structure whether you need to select the right admixtures for your concrete, choose the correct waterproofing membranes for the basement, identify the ideal waterproofing decking systems, install the perfect joint sealants or repair and protect your concrete or steel structure. Furthermore, Sika is a global company with more than 100 production and marketing companies in over 70 countries. With its Construction Division, Sika is a full range supplier for car park structures from basement to roof, from inside to outside. Sika is the most complete and competent partner for the new construction, protection and refurbishment and we are sure this brochure will give you a good overview of Sika's solutions. For further support and information, please contact your local Sika company or go to www.sika.com.

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Parking Structures Today



Introduction

Parking has become a vital part of today's mobile community, especially in metropolitan areas including airports, all of which are growing at an ever faster rate. This means continually providing more parking spaces by building new car parks and frequently extending and refurbishing existing ones.

Given the choice – Where would you park?

Successful parking structures are designed to meet the users demands, which usually include feeling safe and welcome, plus knowing that their cars are in a secure environment. Given the choice, people always park in light and bright car park where they feel their car and it's contents will be safe and secure.

New Build

Modern parking structures are essential and integrated into Cities' architecture. They are frequently built by using "fast-track" construction techniques, with as much off-site construction as possible, to reduce the disruption in these areas.

Therefore precast and prefabricated sections of steel frames and concrete decks and stairways are usually combined in composite structures for new car parks.

The adequate protection of new build car parks will prevent a cost intensive refurbishment in the future.

Refurbishment

Most of existing multi-storey car parks have been built since 1940 and they are predominantly of reinforced concrete construction, many also have a history of early deterioration, structural defects and shortcomings in safety. This is due to poor design, poor construction, low standards of maintenance and repair, or a combination of all three.

The exposure is more similar to that of bridges and as a result, deterioration, particularly reinforcement corrosion due to the effects of de-icing salts, has had a major impact on their durability. The closure of many areas and even whole car parks for costly repair or replacement has been necessary. These bad experiences have served to emphasize the need for improved performance in design, workmanship and the materials selection, to ensure the performance and safety of new and existing car parking structures.



Investigation and Survey of Existing Parking Structures

In order to discover the root causes of distress and deterioration, it is therefore essential to carry out a professional Condition Survey and Assessment. It is obviously important to balance the cost of the investigative work with the benefits that the information derived will provide; but an appropriate survey and assessment is often key to the process of successfully maintaining and extending the service life of a parking structure.

Typical Exposure of Parking Structures

Multi-storey and underground car parks are both subject to many different stresses, such as:

- Thermal variations
- Rainwater
- Atmospheric carbonation
- De-icing salts
- Automotive fluids
- Pedestrian and vehicular traffic
- Movement
- Groundwater

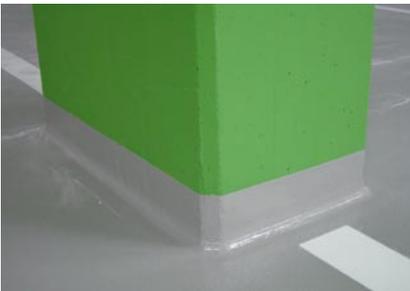
Sika Complete Solutions for the New Construction and Refurbishment of Parking Structures



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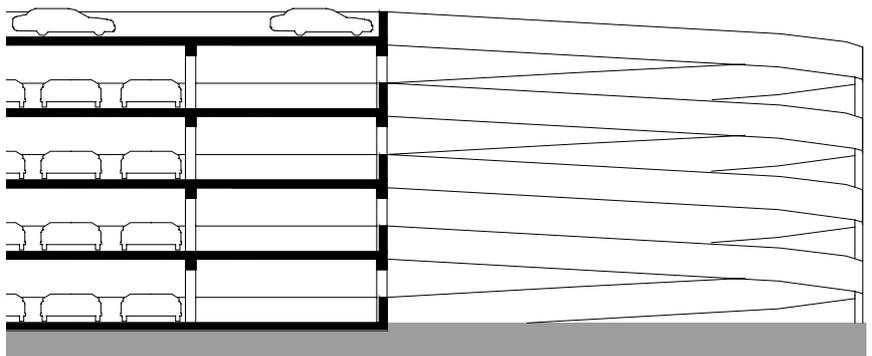
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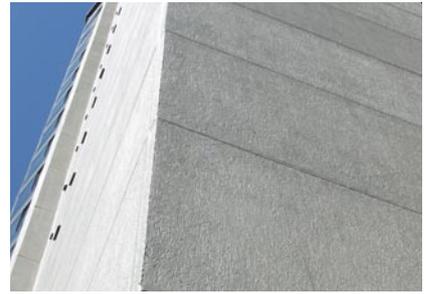


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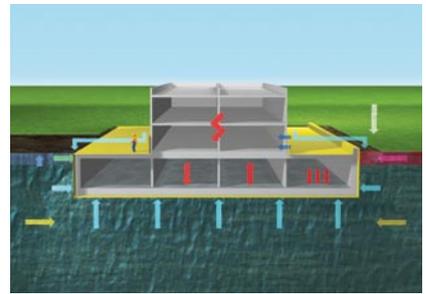


Quality Concrete Production Solutions
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Car Park Flooring and Coating Solutions



Introduction

Car Park Decking Systems have many functions ranging from waterproofing properties to design possibilities. Sika offers a wide portfolio of car park decking systems for various applications and structures. From a technical point of view, the main objective for car park decking systems is to protect the reinforced concrete structure in order to avoid the ingress of water and corrosive de-icing salts.

Therefore, crack-bridging properties are essential to accommodate the movement of the parking structure, especially with steel frame composite structures and exposed areas. Ramps for example need a higher degree of slip resistance and are much more exposed to mechanical stress, which the systems have to withstand.

Sika's car park decking systems can also be designed to the desired colour scheme of your choice. A bright and light car park also helps to improve the safety and security of your car park in order for visitors to feel more comfortable.

Sika's Support and Service

The global presence of Sika means, that we are able to support you in your country in order to assist with the correct selection of the protective system needed. Furthermore, our technical teams are more than happy in helping you to decide on the right solutions for your car park by offering the necessary tests reports, specifications and trial areas.



Systems for Occupied Premises



The requirements for waterproofing and wearing surfaces over occupied premises are especially demanding. They must not only prevent the ingress of water but also withstand the mechanical exposure caused by the traffic.

Requirements

Broadcast highly crack-bridging waterproofing screed

- Dynamic and static crack-bridging properties up to -20°C
- Waterproof
- Abrasion resistant
- German standard (OS-11 a)
- UV-stable

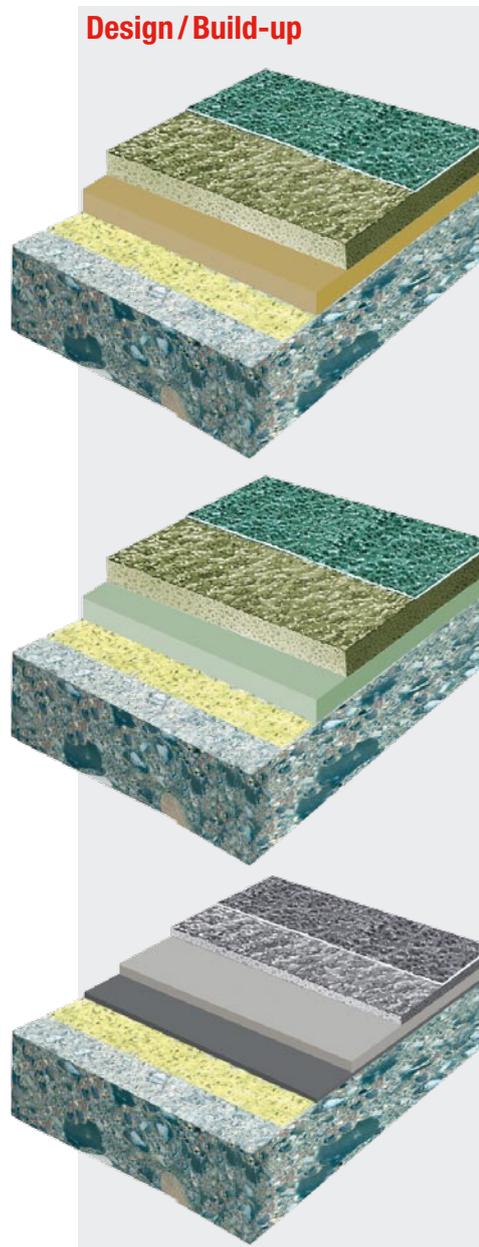
Broadcast highly crack-bridging coloured screed

- Dynamic and static crack-bridging properties up to -20°C
- Waterproof
- Abrasion resistant
- German standard (OS-11 a)
- UV-stable

Broadcast fast curing reinforced crack-bridging screed

- Crack-bridging properties
- Reinforced
- Waterproof
- Fast curing
- Abrasion resistant

Design / Build-up



Sika System / Performance

Primer: **Sikafloor®-156/-161**
 Membrane: **Sikalastic®-821 LV**
 Wearing course: **Sikafloor®-375**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-359 N**

A total solid, coloured, highly crack-bridging, spray-applied, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 3 – 5 mm**

Primer: **Sikafloor®-156/-161**
 Membrane: **Sikafloor®-350**
 Wearing course: **Sikafloor®-375**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-359 N**

A total solid, coloured, highly crack-bridging, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 3 – 5 mm**

Primer: **Sikafloor®-10/-13 Pronto**
 Base coat: **Sikafloor®-15 Pronto**
 Fleece: **Sikalastic®-120 Fleece**
 Encapsulation layer: **Sikafloor®-15 Pronto**
 Wearing course: **Sikafloor®-15 Pronto**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-18 Pronto**

A fast curing, coloured, crack-bridging, reinforced, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 4 – 5 mm**

Systems for Top Decks and Exposed Areas



The requirements for waterproofing and wearing surfaces for exposed areas are to prevent the ingress of water and chlorides and offer a long term solution for refurbishment and new build structures. Therefore, crack-bridging properties are necessary to deal with the thermal variation.

Requirements

Broadcast Coloured Flexible Screed

- Static crack-bridging properties up to -10 °C
- Coloured
- Waterproof
- Abrasion resistant

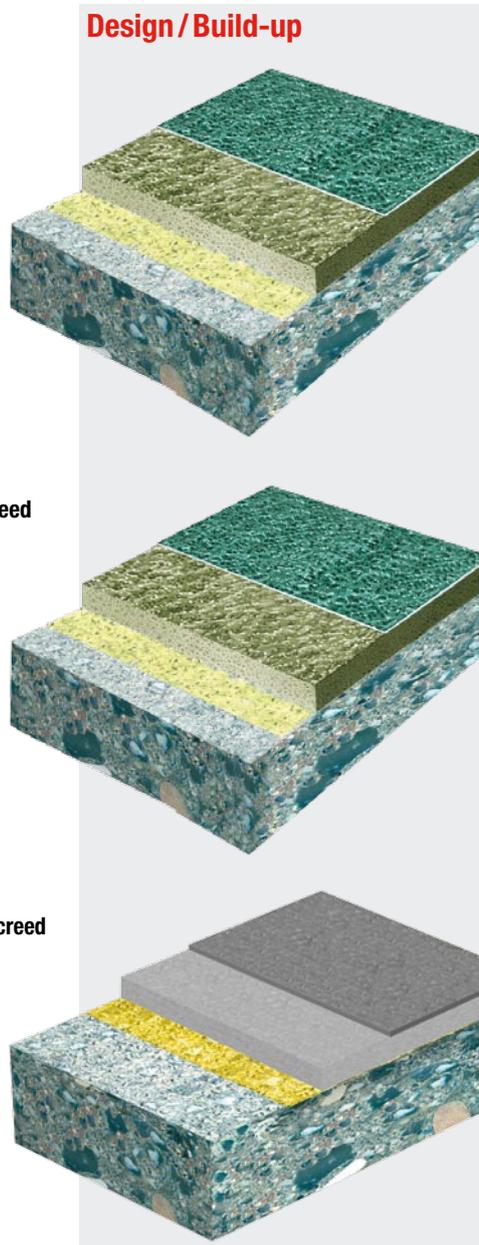
Broadcast Crack-Bridging Coloured Screed

- Dynamic and static crack-bridging properties up to -20 °C
- Coloured
- Waterproof
- Abrasion resistant
- Meets German Standard (OS-11b)

Broadcast Fast Curing Crack-Bridging Screed

- Crack-bridging properties
- Coloured
- Waterproof
- Abrasion resistant
- Fast cure

Design / Build-up



Sika System / Performance

Primer: **Sikafloor®-156/-161**

Base coat: **Sikafloor®-375**

Broadcast: quartz sand

Seal coat: **Sikafloor®-359 N**

A total solid, coloured, flexible, protective waterproofing and wearing surface for car park decks.

Total system thickness: ca. 2 – 3 mm

Primer: **Sikafloor®-156/-161**

Wearing course: **Sikafloor®-350 N Elastic**

Broadcast: quartz sand

Seal coat: **Sikafloor®-359 N**

A total solid, elastomeric, protective waterproofing and wearing surface for car park decks.

Total system thickness: ca. 3 – 4 mm

Primer: **Sikafloor®-10/-13 Pronto**

Base coat: **Sikafloor®-15 Pronto**

Broadcast: quartz sand

Seal coat: **Sikafloor®-18 Pronto**

A total solid, coloured, fast curing, elastomeric, protective waterproofing and wearing surface for car park decks.

Total system thickness: ca. 2 – 4 mm

Systems for Intermediate Decks



The requirements for waterproofing and wearing surfaces for exposed areas are to prevent further damage of refurbished decks and to offer a long term solution by avoiding the ingress of water and chlorides of new build structures. For intermediate decks of steel frame structures, it may be necessary to use a highly crack-bridging system (please refer to systems for Top Decks and Exposed Areas on the previous pages).

Requirements

Broadcast tough elastic screed

- Static crack-bridging properties
- Waterproof
- Abrasion resistant
- Impact resistant

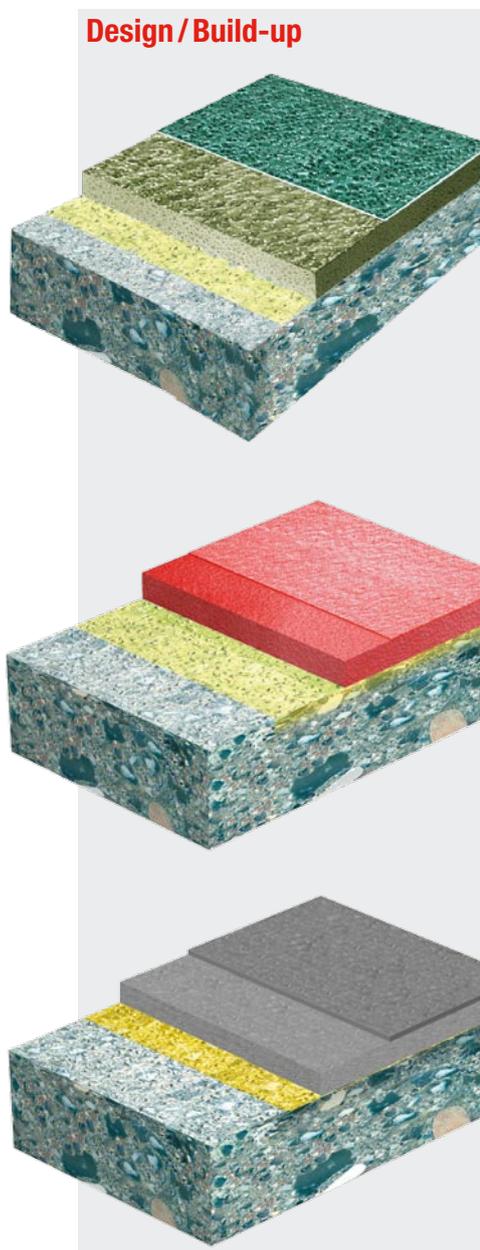
Broadcast coloured rigid screed

- Waterproof
- Abrasion resistant
- Impact resistant

Broadcast fast curing screed

- Waterproof
- Fast curing
- Abrasion resistant

Design / Build-up



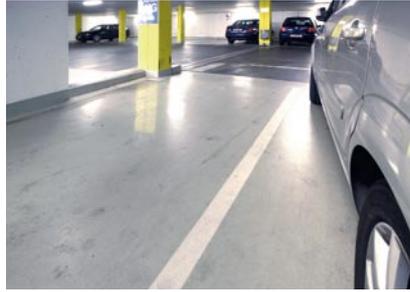
Sika System / Performance

Primer: **Sikafloor®-156/-161**
 Wearing course: **Sikafloor®-325**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-358/-359 N**
 A total solid, coloured, static crack-bridging, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 2 – 3 mm**

Primer: **Sikafloor®-161**
 Wearing course: **Sikafloor®-263 SL**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-264**
 A total solid, coloured, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 2 – 4 mm**

Primer: **Sikafloor®-10/-13 Pronto**
 Wearing course: **Sikafloor®-14 Pronto**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-18 Pronto**
 A fast curing, coloured, protective waterproofing and wearing surface for car parking structures.
 Total system thickness: **ca. 2 – 4 mm**

Systems for Ground Bearing Slabs



Wearing surfaces for ground bearing slabs often have to deal with rising moisture due to a missing or damaged damp proof membrane. In this case, vapour permeable systems or the unique **Sikafloor®-EpoCem** Technology should be used.

Requirements

Monolithic Finish for Concrete

- Economic hardener
- Good abrasion resistance
- Good impact resistance
- Colours available

Broadcast ECC screed

- Medium wear resistance
- Medium thermal shock resistance
- Slip resistance
- Coloured

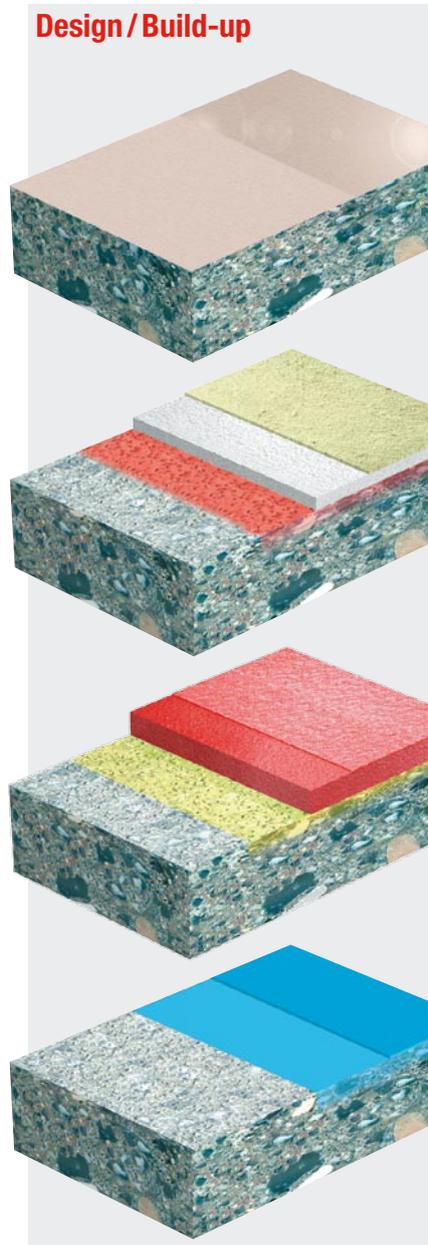
Broadcast coloured rigid screed

- Waterproof
- Abrasion resistant
- Impact resistant

Water dispersed coloured roller coating

- Light to medium wear resistance
- Surface stabilization
- Prevent concrete dusting
- Coloured

Design / Build-up



Sika System / Performance

Monolithic concrete slab using **Sikament®** or **Sika® ViscoCrete®** SCC Technology. Dry shake floor hardener **Sikafloor®-3** QuartzTop applied to the fresh concrete slab before the powerfloat finish, surface cured and sealed with **Sikafloor®-Proseal W** or **Sikafloor®-Proseal-22**.

Primer: **Sikafloor®-155 WN**

ECC screed: **Sikafloor®-81 EpoCem**

Broadcast: quartz sand

Seal coat: **Sikafloor®-264**

A total solid, coloured, ECC-binder for levelling and broadcast systems for ground bearing slabs with a high moisture content.

Total system thickness: **ca. 2 – 3 mm**

Primer: **Sikafloor®-161**

Wearing course: **Sikafloor®-263 SL**

Broadcast: quartz sand

Seal coat: **Sikafloor®-264**

A total solid, coloured, protective waterproofing and wearing surface for car parking structures.

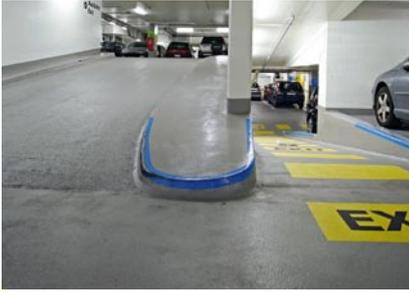
Total system thickness: **ca. 2 – 4 mm**

Coating: 2 x **Sikafloor®-2530 W**

A two part, water dispersed, coloured, epoxy resin based coating.

Total system thickness: **0.15 – 0.25 mm**

Systems for Ramps



Waterproofing and wearing surfaces for ramps are especially exposed to mechanical impact and abrasion. They should offer a hard wearing surface in order to deal with the traffic not only on the ramps but at the turning circles as well. For exposed areas, it may be necessary to use a highly crack-bridging system (please refer to systems for Top Decks and Exposed Areas on the previous pages).

Requirements

Broadcast tough elastic screed

- Static crack-bridging properties
- Waterproof
- Abrasion resistant
- Impact resistant

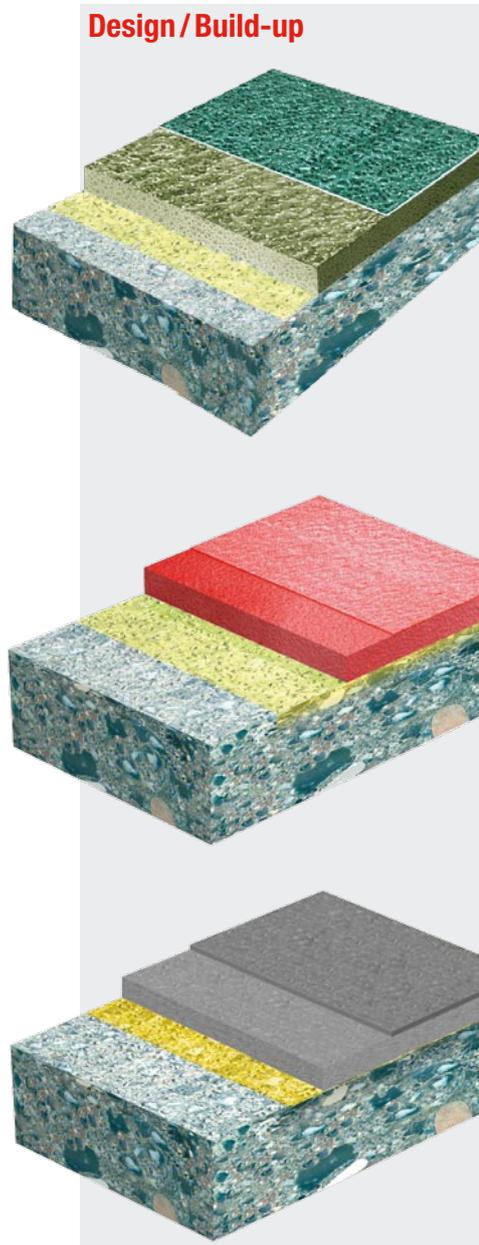
Broadcast coloured rigid screed

- Waterproof
- Abrasion resistant
- Impact resistant

Broadcast fast curing screed

- Waterproof
- Fast curing
- Abrasion resistant

Design / Build-up



Sika System / Performance

Primer: **Sikafloor®-156/-161**

Wearing course: **Sikafloor®-325**

Broadcast: quartz sand

Seal coat: **Sikafloor®-358/-359 N**

A total solid, coloured, static crack-bridging, protective waterproofing and wearing surface for car parking structures.

Total system thickness: **ca. 2 – 3 mm**

Primer: **Sikafloor®-161**

Wearing course: **Sikafloor®-263 SL**

Broadcast: quartz sand

Seal coat: **Sikafloor®-264**

A total solid, coloured, protective waterproofing and wearing surface for car parking structures.

Total system thickness: **ca. 2 – 4 mm**

Primer: **Sikafloor®-10/-13 Pronto**

Wearing course: **Sikafloor®-14 Pronto**

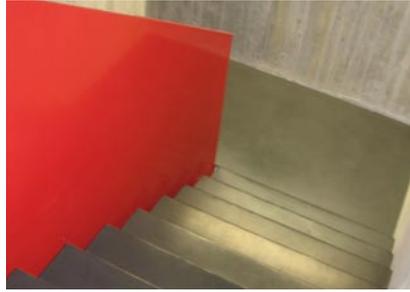
Broadcast: quartz sand

Seal coat: **Sikafloor®-18 Pronto**

A fast curing, coloured, protective waterproofing and wearing surface for car parking structures.

Total system thickness: **ca. 2 – 4 mm**

Systems for Entrance Areas, Walkways and Staircases



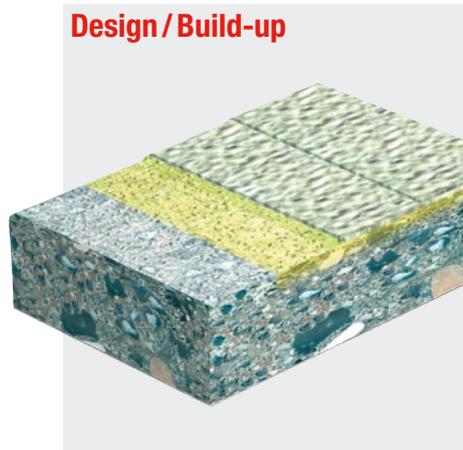
The entrance area, walkways and staircases are the business card of a car park. Floor and wall coatings not only have to fulfil all technical requirements but also be aesthetically pleasing. **Sikafloor®-264 Thixo** offers the right balance between cleanability and slip resistance, so that the floor of your entrance area of your car park always looks inviting.

Requirements

Textured, coloured rigid coating

- Good wear and abrasion resistance
- Good chemical resistance
- Slip resistance
- Easy cleaning
- Coloured

Design / Build-up



Sika System / Performance

Primer: **Sikafloor®-156/-161**

Coating: **Sikafloor®-264 Thixo**

A total solid, coloured, epoxy binder for textured coating systems.

Total layer thickness: approx. **0.6 – 0.8 mm**

Sikagard®-Wallcoat N offers an easy to clean, mechanical and chemical resistant solution for walls and soffits. Therefore, it is especially suitable for the use in staircases and for parapet walls in order to remove easily the exhaust marks of cars. Furthermore, a wide portfolio of wall and soffit coatings is available from Sika, ranging from hydrophobic impregnations to elastic protective coatings, which are described on page 26.

Requirements

Water dispersed coloured wall coating

- Good chemical and mechanical resistance
- Good opacity
- Water vapour permeable
- Easy to clean
- Odourless
- Coloured

Design / Build-up



Sika System / Performance

Primer: **Sikagard®-Wallcoat N** + 5% water

Coating: **Sikagard®-Wallcoat N**

A coloured water dispersed epoxy resin based coating for walls.

Total layer thickness: approx. **0.2 – 0.4 mm**

Car Park Maintenance Instruction for Flooring



Coatings for multi-storey car parks are exposed to different types of loads such as thermal, mechanical and chemical stresses. The concrete surface must be protected not only from damaging media such as water, chloride, fuels, oils or battery acids, but also the coating of the floors must bear strong mechanically and abrasive loads when driven over. At the same time high requirements in terms of aesthetics and durability have to be fulfilled. An optimal and regular care of the coating supports their preservation of value and thus ensures long protective function. Especially in the cold and wet season the slip resistance for the floor of the car park becomes very important.

The intensity and the frequency of the cleaning intervals depend strongly on the frequency of the use, weather conditions and the situation of the surfaces in the multi-storey car park. The decision of whether an individual multi-storey car park must be cleaned daily, weekly, monthly or annually, can be specified only in accordance with the individual local conditions. Therefore, an optimal cleaning plan will be set up only after a certain trial period.

For the different requirements and conditions in different individual projects, individual investigation of the assigned machines, procedures and chemicals is recommended. The selection of the machines depends strongly on the size of the surfaces which have to be maintained and the spatial conditions (e.g. passage heights, downward gradients). Therefore please always seek advice from your local cleaning company or the manufacturer of cleaning agents or/and equipment.

Car Park Corrosion Protection Solutions for Steel Structures



SikaCor® systems provide protection against thermal variations, rainwater, aggressive pollutants, de-icing salts and automotive fluids for steel.

Requirements

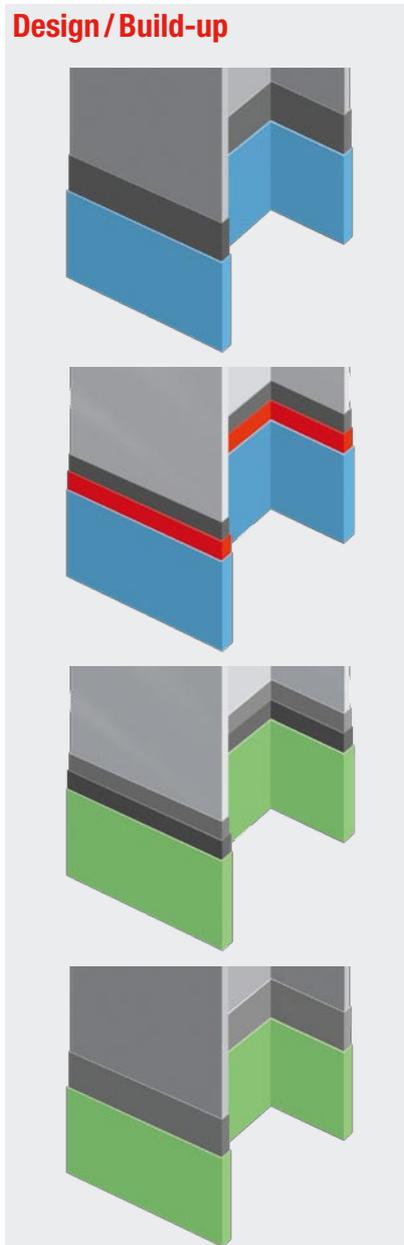
SikaCor®-EG System Rapid

- Fast curing, even at temperatures below zero
- High mechanical and chemical resistance
- Manual or spray application on steel
- In accordance with DIN EN 12944
- Designed for the application in paint shops

SikaCor®-6630-System

- 1-component high build corrosion protection system
- Easy to apply
- Suitable for the application on steel, galvanised steel and as maintenance system on not perfectly derusted surfaces
- Designed for the application on job sites

Design / Build-up



Sika System / Performance

Build up for steel surfaces:

Primer: **SikaCor®-EG 1 Rapid**

Top coat: **SikaCor®-EG 4/5 Rapid**

DFT: approx. 160 µm

Durable 2-component corrosion protection system for carbon steel and galvanised steel with high aesthetically finish and UV-resistance.

Build up for steel surfaces:

Primer: **SikaCor®-Friezinc R Rapid**

Base coat: **SikaCor®-EG 1 Rapid**

Top coat: **SikaCor®-EG 4/5 Rapid**

DFT: approx. 240 µm

Build up for steel surfaces:

Primer: **SikaCor® 6630 high-solid EG**

Base coat: **SikaCor® 6630 high-solid EG**

Top coat: **SikaCor® 6630 high-solid**

DFT: approx. 240 µm

Build up for galvanised steel surfaces:

Primer: **SikaCor® 6630 high-solid EG**

Top coat: **SikaCor® 6630 high-solid EG**

DFT: approx. 160 µm

Build up for maintenance:

Primer: **SikaCor® 6630 Primer**

Base coat: **SikaCor® 6630 high-solid EG**

Top coat: **SikaCor® 6630 high-solid**

DFT: approx. 240µm

1-component corrosion protection system for carbon steel, galvanised steel and existing coatings with aesthetically finish and UV-resistance.

Car Park Fire Protection Solutions for Steel Structures



Sika spray applied cementitious fire protection mortars can provide long term fire resistance up to 3 hours for steel structures.

Requirements

Fire protection for interior steel structures

- Fire resistance up to 180 minutes
- Protects the steel from heat
- Thick layer application
- Applicable on steel and concrete

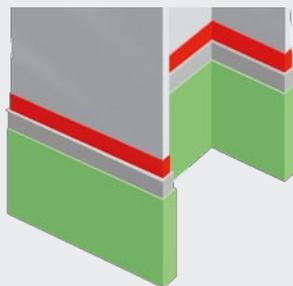
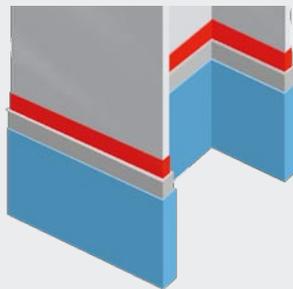
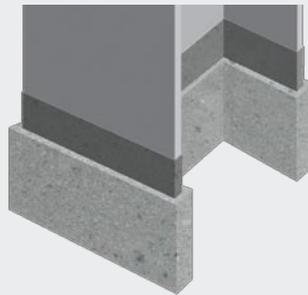
Fire protection for interior steel structures

- Fire resistance up to 90 minutes
- Forms an insulating foam
- Thin layer application
- Does not increase static load
- Applicable on steel and galvanised steel

Fire protection fro exterior steel structures

- 1-component high build corrosion protection system
- Easy to apply
- Suitable for the application on steel, galvanised steel and as maintenance system on not perfectly derusted surfaces
- Designed for the application on job sites

Design / Build-up



Sika System / Performance

Build up for steel surfaces:
 Primer: **Sika® Cementitious Primer**
 Fire protection: **Sika® Cemeticious Spray Applied Mortar**
 Please refer to your local Sika office, fire protective, spray applied mortars are offered by various Sika companies, in accordance with the local legislation.

Build up for steel surfaces:
 Primer: **Sika® Permacor® 1705**
 Intumescent coat:
Sika® Unitherm® 38091 interior
 Top coat: **Sika® Unitherm® 7854**
 DFT: depending on the massivity of the steel parts and the requested fire resistance class.

Build up for galvanised steel:
 Build up for steel surfaces:
 Primer for galvanised steel is:
Sika® Permacor® 2706 EG
 Intumescent coat:
Sika® Unitherm® 38091 interior
 Top coat: **Sika® Unitherm® 7854**
 DFT: depending on the massivity of the steel parts and the requested fire resistance class.

Build up for steel surfaces:
 Primer: **Sika® Permacor® 1705**
 Intumescent coat:
Sika® Unitherm® 38091 exterior
 Top coat: **Sika® Unitherm® 7854**
 DFT: depending on the massivity of the steel parts and the requested fire resistance class

Car Park Detail and Joint Solutions

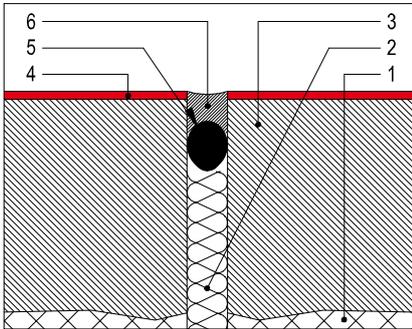


Details, such as joints, covings and drainage connections need special attention in order to create a fully functioning system. **Sikafloor**® car park decking systems can be combined with detailing solutions for all applications, which is supported by an excellent track record.

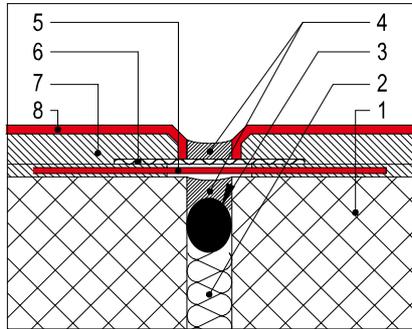
Solutions for Joint Details

Sika joint detail solutions can be used when vertical, horizontal or shear movements are occurring. These solutions are especially suitable for a complex geometry and directional changes, which can often be found on a construction site. Jointing systems are ranging from flexible PUR joint sealants for easy maintenance to flexible PUR joint sealants in combination with a hypalon membrane for improved waterproofing capabilities or surface mounted mechanical jointing systems, which can be easily bonded to our **Sikafloor**® car park decking systems.

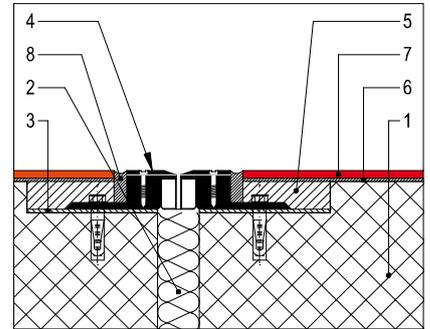
Flexible PUR joint sealant – Sikaflex®-PRO-3 WF



Flexible PUR joint sealant with waterproofing hypalon membrane – Sikadur®-Combiflex® System



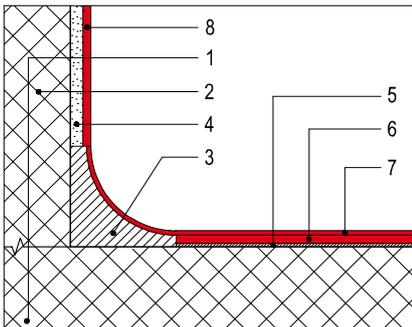
Mechanical jointing system



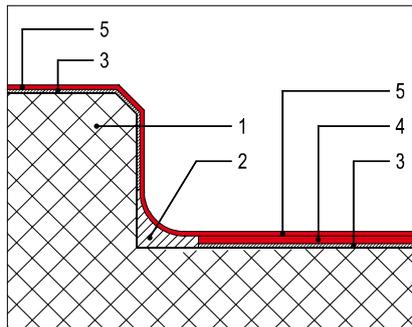
Solutions for Rigid Floor Wall Connections

Rigid covings for walls, columns etc. can be carried out by using an epoxy mortar, such as **Sikafloor**®-280 or **Sikafloor**®-156 + quartz sand. The **Sikafloor**® car park systems can now be brought up to the wall or column surfaces. This will allow easy cleaning and maintenance avoiding standing water in those critical areas.

Rigid covings



Rigid covings and plinth connection



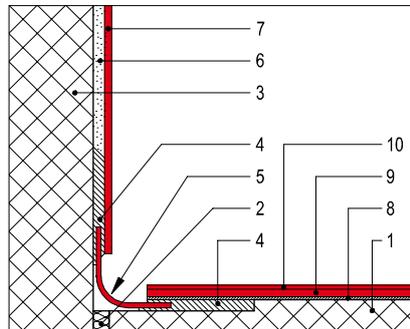
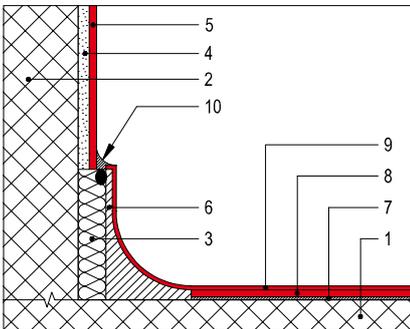


Solutions for Flexible Floor Wall Connections

Covings between two elements, which are subject to movement, can be waterproofed using a high performance polyurethane sealant, such as **Sikaflex®-PRO-3 WF** or a hypalon membrane, such as the **Sikadur®-Combiflex®** System.

Movable coverings with a PUR joint sealant – **Sikaflex®-PRO-3 WF**

Movable coverings with a hypalon membrane – **Sikadur®-Combiflex®** System

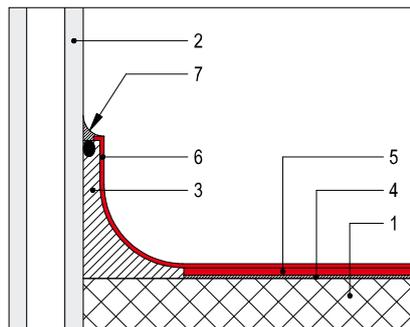
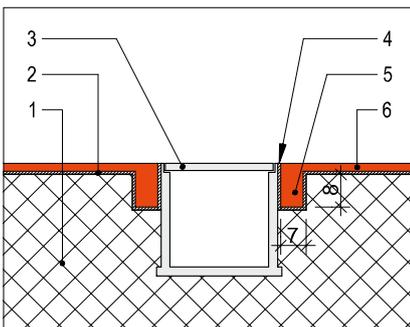


Solutions for Flexible Drainage and Pipe Connections

Flexible connections for drainage systems, gullies or pipes are necessary in order to connect materials with a different e-modulus and therefore different elongation. Furthermore, Sika offers a wide selection of primers for different substrates, ranging from concrete, steel or galvanised steel in order to offer optimised adhesion.

Connection to drainage channels and gullies

Connection to drainage pipes



Car Park Quality Concrete Production Solutions



Introduction

Sika is a global leader in supplying technical solutions and products to the concrete producing industry and its customers. Our experience in concrete and mortar technology dates back to 1910.

Concrete quality is important for your car park

Since concrete is the base of the load bearing structure, it is verbally the foundation for a functioning, durable and low-maintenance building. Many factors influence the final quality of the concrete structure: good workability speeds up the construction process and reduces mistake during concrete placing; Sika superplasticisers allow significant reduction of the water/cement ratio, which improves strength, durability and water tightness as well as workability; Increased early strength can reduce the demoulding time; Controlled air entrainment improves the frost / thaw resistance while proper curing of the concrete after placing helps to avoid damages by early dehydration. There are many other possibilities to improve your concrete, talk to us about it!

Sika Concrete Solutions

Requirements

Increase of concrete durability and strength

- Increase of concrete density
- Reduction of porosity
- Reduced ingress of harmful substances

Improvement of workability and W/C reduction

- Very high reduction of water/cement ratio
- Excellent workability of fresh concrete
- Extended slump keeping possible without strength retardation
- Reduced porosity

Increased early strength development in first hours/days

- Earlier stripping of formwork
- Accelerated construction process

Waterproofing concrete

- Reduction of concrete porosity
- Blocking of concrete capillaries
- Excellent product portfolio in watertight concrete structures

Set retardation of concrete

- Set retardation extends the workability time of concrete
- Reduction of peak concrete temperature while curing

Frost resistance

- For areas with cold winters

Sika System / Performance

Newest generation superplasticers:

Sika® ViscoCrete®

Silicafume based concrete additives:

SikaFume® / Sikacrete®

Increase physical and chemical resistance.

Newest generation superplasticers:

Sika® ViscoCrete®

Note: Self compacting concrete is only one example. The cost performance and technical possibilities created benchmarks in the global market.

Hardening accelerator:

SikaRapid®

Allows placing concrete at lower temperatures and enables early load bearing capabilities

Newest generation superplasticers:

Sika® ViscoCrete®

Capillary blocking agent:

Sika® -1

Set retarder:

Sika Retarder®

Controls the set and temperature development

Air entraining agent:

Sika® Aer®

Controlled entrainment of tiny air bubbles increases the frost and freeze/thaw resistance of concrete.



Car Park Joint Sealing Solutions for Facades and Precast Concrete Elements



Introduction



Large scale use of polyurethane based joint sealants in the construction industry is a Sika innovation, which gives us more than 30 years experience for this application. Now Sika is a global leader in supplying performance sealants for concrete elements.

Reliable performance of sealants for concrete joints is essential. Joint sealants do not only "fill gaps" between concrete elements, their task is much more important! They connect 2 elements in a flexible way, so they have to have excellent bonding properties and keep their flexibility long-term. Even after numerous contractions and expansions they also have to prevent the ingress of pollutants and moisture into the structure.

The requirements for excellent performance of the joint sealant vary depending on their uses and exposure, e.g. easy application, reliable quality, mechanical and chemical resistance, durability, UV- and colour stability, etc.

Sika Joint Sealing Solutions for Facade and Precast Concrete Elements

Requirements

Joints for precast elements

- Elastic sealing of joints between precast concrete elements
- External and internal application

Joints for façades

- Joint sealing for concrete façades
- UV exposed areas

Sika System / Performance

Sikaflex® Construction

Universal PU based joint sealant for connection joints.

Very economical, easy application.

Sikaflex® PRO-2 F

Well proven PU-based joint sealant for movement joints. Excellent durability.

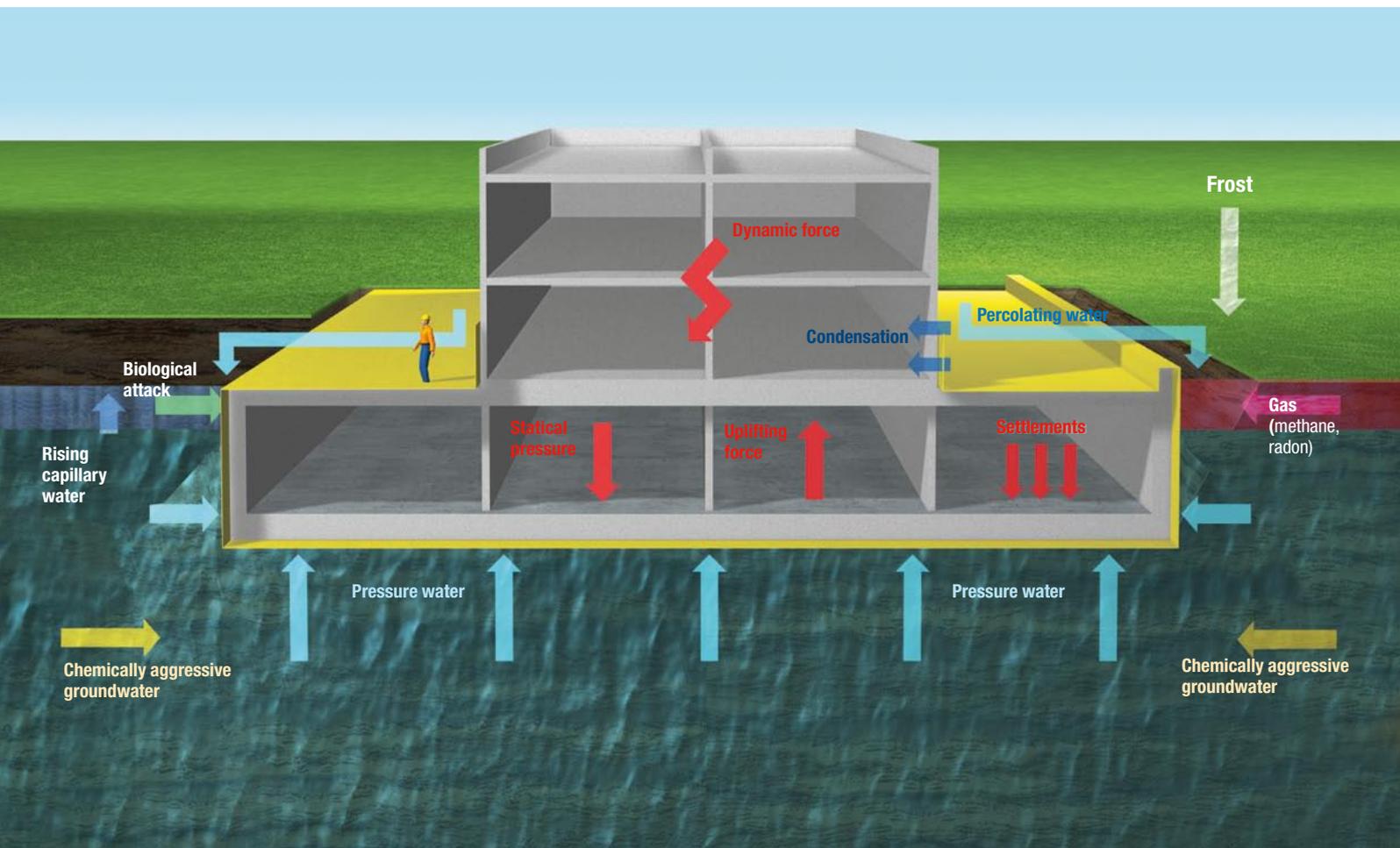
Sikaflex® PRO HP

PU based joint sealant, well proven for façade joints.

Sikaflex® AT-Façade

Based on Sika AT Technology, combining advantages of PU on oneside and silane terminated polymers on the other hand.

Car Park Basement Waterproofing Solutions



Introduction

The waterproofing of your buildings' basement is of utmost importance, because functioning waterproofing systems are essential for a smooth operation of an underground car park. Besides, damages caused by water entering the basement can result in major additional cost during the life cycle of your structure and they can even reduce its life span.

Basements are in physical contact with the ground, and they can be divided into three sections:

1. Basement floor slabs (horizontal waterproofing),
2. Basement walls, including the joints (vertical waterproofing)
3. Basement roof slabs (horizontal waterproofing for the roof covered with soil).

The primary purpose of below ground waterproofing is to prevent the ingress of water into the basements' interior as well as moisture penetration into and through the porous structure of the basement envelope. Another frequent requirement is the prevention of corrosive pollutants, like chlorides and sulphates, entering the structure together with the groundwater. This might impair the structural integrity of the building.

Sika provides a wide range of different systems and solutions which are used for the waterproofing of underground car parks. Main components are systems for waterproofing the concrete envelope (concrete matrix and joints), flexible waterproofing with membranes, waterproof renderings and specialities like injection systems.

Selection Principle

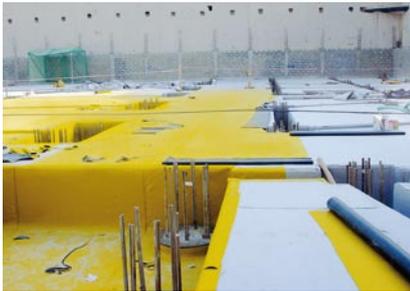


The selection of the best system for a specific project depends on many factors, including the local ground conditions.

Waterproofing is closely connected with the structural design and construction of a basement. Therefore it is important for the designer to integrate the selected waterproofing system into the structural design at an early stage.

Sika's unique product range and know how in waterproofing add real value to your investment – since 100 year.

Systems for Basement Waterproofing

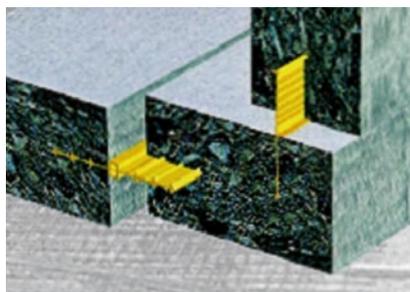


Requirements / Performance

Waterproofing of concrete structures including joints

- Watertight concrete
- Watertight joints

This system makes concrete an integrated part of the basement waterproofing, including construction and expansion joints. Sika offers a full system of this watertight structure ("White Box") including all detailing and necessary components.



Sika Solution

Sika® ViscoCrete®

Superplasticiser for dense concrete and excellent workability

Sika®-1

Capillary blocking agent for concrete

Sika® and Tricosal® Waterbars

For waterproof joints in concrete

Sika® Fuko

Injection hoses

Sikadur®-Combiflex®

High quality sealing tape

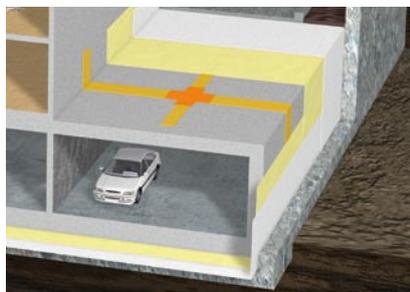
SikaSwell®

Wide range of swelling gaskets

Basement waterproofing with membranes

- Flexible membranes
- Compartment system

The Sika membrane system allows to avoid water to enter the concrete structure in the first place. The unique Sika combination of membranes, water bars and tapes permits the creation of compartments within the protective hull, which makes it easier to control an repair potential leaks.



Sikaplan® WP and Sikaplan® WT

Flexible and synthetic waterproofing membranes including components for compartment systems

Sika® Waterbars and

Sikadur®-Combiflex® and

Sika® Dilatec tapes

Components for compartment system: together with Sikaplan® membranes allows future waterproof control and repair

Refurbishment

- Injection systems with injection hoses and packers
- Renderings for watertight linings

Sika offers a wide range of injection materials, cementitious or based on polyurethane, epoxy resins, acrylic resins etc.

These systems are used for the injection of Sika® Fuko injection hoses and for remedial applications using packers



Sika® Fuko

Injection hoses

Sika® Injection, InejctoCem®, Sikadur®

PU, Acrylate, EP and cementitious based injection materials

Sika®-1, Sika® MonoTop®,

SikaTop® and Sikagrad® EpoCem®

Waterproof renderings and linings

Car Park Concrete Refurbishment Solutions



The basis of any car park flooring system is a solid and sound concrete structure. Therefore, proper maintenance of the reinforced concrete structure is essential in order to guarantee a prolonged design life. 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 loading

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 (e.g. European Standards EN 1504).

Sika Solutions for the Refurbishment of Parking Structures

Sika offers a full range of well introduced and innovative solutions for concrete refurbishment, for example:

- High performance repair mortars
- Full range of hydrophobic impregnations
- Various type of surface coatings
- Unique corrosion inhibitors
- Proven strengthening systems

In addition Sika can provide innovative proven solutions for certain conditions eg. repair mortars which can be applied to soffits while the car deck above is in use (application under dynamic loading)

Sika products are available worldwide through the local Sika companies and our specialist contracting and distribution partners.



Systems for Concrete Repair



Sika produces a full range of products and systems for structural and non-structural concrete repair, as reinforcement corrosion protection, bonding primers for difficult substrates, repair mortars with special properties and smoothing and levelling mortars for special site conditions on job site.

Sika Concrete Repair Solutions

For localised, non-structural concrete repair



Example of Sika repair system (R2)

- Reinforcement Corrosion Protection
Sika® MonoTop®-910 N
- Bonding primer (if necessary)
Sika® MonoTop®-910 N
- Repair mortar
Sika® MonoTop®-211 series
- Smoothing mortar
Sika® MonoTop®-723 N

Characteristics

- Class R2 repair system according European Standard EN 1504-3
- One-component system
- Easy handling and application
- Accelerated setting for fast repair works (**Sika® MonoTop®-211 series**)
- Repair mortar with corrosion inhibitors

For structural concrete repair



Example of Sika repair system (R3)

- Reinforcement Corrosion Protection
Sika® MonoTop®-910 N
- Bonding primer (if necessary)
Sika® MonoTop®-910 N
- Repair mortar
Sika® MonoTop®-352 series
- Smoothing mortar
Sika® MonoTop®-723 N

Characteristics

- Class R3 repair system according European Standard EN 1504-3
- Easy handling and application
- Better yield (light weight repair mortar)
- Thick layer application
- Sulphate resistance
- Low shrinkage behavior (**Sika® MonoTop®-352 series**)

For structural concrete repair with increased requirements



Example of Sika repair system (R4)

- Reinforcement Corrosion Protection
SikaTop®-Armatec®-110 EpoCem
- Bonding primer (if necessary)
SikaTop®-Armatec®-110 EpoCem
- Repair mortar
Sika® MonoTop®-412 series
- Smoothing mortar
Sikagard®-720 EpoCem®

Characteristics

- Class R4 repair system according European Standard EN 1504-3
- Designed for demanding concrete repairs
- For hand and wet spray application
- Proved for repair work under dynamic loading
- Sulphate resistance
- Low shrinkage behavior (**Sika® MonoTop®-412 series**)

Systems for Concrete Protection



To prevent further damages on concrete structures due to water, carbon dioxide, chlorides or other ingresses, concrete structures have to be protected. Sika produces a full range of surface applied corrosion inhibitors, impregnations, hydrophobic impregnations and specialized colored coatings for use in protecting reinforced concrete facades, walls and soffits of park decks.

Sika Concrete Protection Solutions

Hydrophobic impregnation/ corrosion inhibitor



Sika concrete protection system

- Surface applied corrosion inhibitor
Sika® FerroGard®-903+
- Hydrophobic impregnations for high protection requirements
Sikagard®-706 Thixo
Sikagard®-705 L
Sikagard®-704 S
- Hydrophobic impregnations for moderate protection requirements
Sikagard®-740 W
Sikagard®-700 S

Characteristics

- Unique, invisible protection system for steel bars and concrete surfaces
- High cost efficiency
- Easy to apply

Rigid protective coating systems



Sika concrete protection system

- Water based system for standard requirements
Sikagard®-675 W ElastoColor
- Solvent based solution for high performance requirements
Sikagard®-680 S

Characteristics

- Complies with EN 1504-2
- Easy to apply
- Highest protection characteristics (**Sikagard®-680 S**)
- Long-time experience

Elastic protective coating systems



Sika concrete protection system

- System for moderate crack-bridging requirements
Sikagard®-552 W Aquaprimer plus
Sikagard®-550 W Elastic
- System for high crack-bridging requirements
Sikagard®-552 W Aquaprimer plus
Sikagard®-545 W Elastofill plus
Sikagard®-550 W Elastic

Characteristics

- Approved for low temperatures down to -20°C
- Environmentally friendly
- Good crack-bridging behavior
- Durable
- Long-time experience

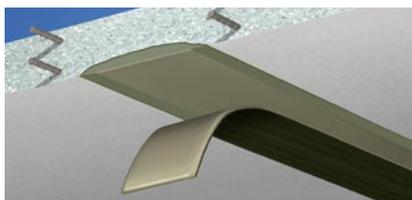
Systems for Structural Strengthening



Sika systems for structural strengthening using fiber reinforced polymers are used for flexural strengthening of beams and slabs, shear strengthening of beams and to increase axial, shear and flexural capacity of columns as well as earthquake strengthening systems. Sika provides a full range of carbon fiber reinforced polymers (CFRP) systems as plates, fabrics or post-tensioning systems.

Sika Structural Strengthening Solutions

Flexural strengthening systems



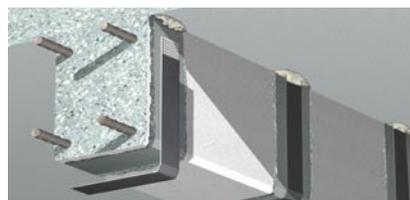
Sika strengthening systems

- Carbon plate system
Sikadur®-30 epoxy adhesive plus **Sika® CarboDur®** carbon fiber reinforced plates (CFRP)
- Post-tensioning system
Sikadur®-30 epoxy adhesives plus **Sika® CarboStress®** post tensioning plates

Characteristics

- High tensile strength
- No corroding
- Low weight
- Easy handling
- Limit deflection and cracks, increase fatigue resistance (post-tensioning system)

Shear strengthening systems



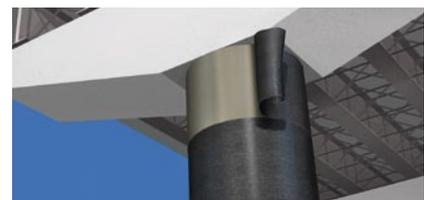
Sika strengthening systems

- L-shape elements for beams
Sikadur®-30 epoxy adhesive plus **Sika® CarboShear®** prefabricated L-shape carbon fiber reinforced plates
- Fabric system
Sikadur®-300/-330 epoxy adhesives plus **SikaWrap®** fabrics (carbon, glass or aramid)

Characteristics

- High tensile strength
- Unique L-shape system for reduced on-site labour
- Low weight
- No corroding

Axial strengthening systems



Sika strengthening systems

- High performance confinement system
Sikadur®-300/-330 epoxy adhesives plus **SikaWrap®** fabrics (carbon, glass or aramid)

Characteristics

- Adjustable shape
- Easy application
- Increase axial capacity and vehicle impact resistance
- Seismic strengthening

Car Park Roofing Solutions



Introduction

Sika is the global market leader in waterproofing of roofs with flexible membranes, with decades of experience, high quality performance, global presence and support to our customers, etc. Our systems are well known for their quality and, especially if you look at the complete life cycle of your project, excellent cost performance. Also well known is our first rate technical support and reliable supply chain management.

Flat roofs with membrane waterproofing offer additional possibilities for park decks or other traffic areas. With the **Sikalastic**[®] and **Sikaplan**[®]/**Sarnafil**[®] membrane systems, nearly no boundaries are set in the design of park decks. For example parking areas and pedestrian areas can be separated with a roof garden.

With the specially designed and proven System components, **SikaRoof**[®] **UTC**, **Sikalastic**[®] and **Sikaplan**[®]/**Sarnafil**[®] systems offer long lasting and economical waterproofing of park decks.



Systems for Car Park Roofs



Requirements

Car park decks with **Sikalastic®** liquid applied membranes

- Rapidly curing, highly elastic and crack bridging
- Dynamic and static crack-bridging properties up to -20° C
- Wide-range-colours esthetical solutions
- Abrasion resistant
- In accordance with german standard OS-11a

Car park decks with **Sikaplan®** PVC membranes

- Outstanding weldability and workability
- High resistance to mechanical influences, micro organisms and ageing
- In accordance with EN 13956

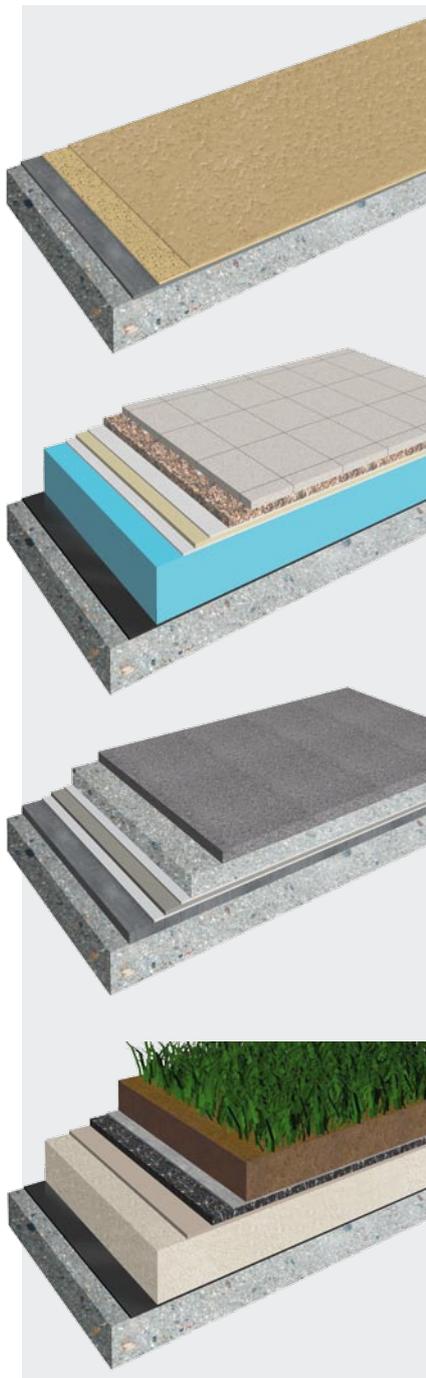
Car park decks with **Sarnafil®** PVC or FPO membranes

- Wide range of specially designed accessories
- High resistance to mechanical influences, micro organisms and ageing
- **Sarnafil® TG 66** (FPO) membrane compatible to old bitumen
- In accordance with EN 13956

Car park decks with green roof areas

- Possible with any of our **SikaRoof® MTC Green/Sikalastic®, Sikaplan®** or **Sarnafil®** membrane systems
- Unlimited design possibilities
- Root resistant membranes
- High resistance to mechanical influences, micro organisms and ageing
- FLL approved systems
- In accordance with EN 13956

Design / Build-up



Sika System / Performance

Primer: **Sikafloor®-156/-161**
 Membrane: **Sikalastic®-821 LV**
 Wearing course: **Sikafloor®-355 N**
 Broadcast: quartz sand
 Seal coat: **Sikafloor®-358/-359 N**
 Total system thickness: ca. 3-5 mm

Pavers
 Chipping bed min 40 mm
 Protection layer: **Sikaplan® 18**
 Membrane: **Sikaplan® SGmA**
 Separation layer: **S-Glass Fleece 120**
 Thermal insulation
 Vapour barrier: **Sarnavap® 3000 M**
 Concrete deck

Asphalt layer
 Concrete slab
 Slip/Protection layer: **S-Felt GK 400**
 Membrane: **Sarnafil® G 410, Sarnafil® G 476, Sarnafil® TG 66**
 Protection layer: **S-Felt A 300**
 Screed layer for slope
 Concrete deck

Plants
 Soil
 Filter layer
 Drainage layer
 Membrane: **SikaRoof® MTC/ Sikalastic®, Sikaplan®/Sarnafil®**
 Thermal insulation
 Vapour barrier: **Sarnavap® 3000 M**
 Concrete deck

Car Park Case Studies



Carpark at Mountain Dwellings Copenhagen, Denmark

Project Description

Named as Mountain Dwellings, this building is located in the Orestad, 33'000 m², a new urban development in Copenhagen, Denmark. It contains housing (1/3) and parking (2/3) in combining successfully the splendours of the suburban backyard with the social intensity of urban density. Its visual appearance is stunning. The nice architecture design and successful construction have enabled it to be the Category Winner of World Architecture Festival 2008. The residents of the 80 apartments will be the first in Orestaden to have the possibility of parking directly outside their homes. The gigantic parking area contains 480 parking spots and a sloping elevator that moves along the mountain's inner walls. In some places the ceiling height is up to 16 meters which gives the impression of a cathedral-like space.

Project Requirements

The color design from facade to floor during the day and during the night makes the building unique from architectural point of view. Its app. 17'000 m² parking area needs to be good-looking, easy to maintain, totally solid, traffic and mechanical resistant, slip resistant, crack bridge capable, protective waterproofing and abrasion resistant.

Sika Solutions

The parking floor area has been painted with **Sikafloor®-161/261/325/358**, and all the parking bays was coated with **SikaCor®-EG 5** and slightly broadcasted with black bauxite. This was a job our denish colleagues had together with a danish contractor "Decorativa". Thanks to our excellent decorative flooring systems designed especially for the use in commercial and residential buildings, colour, comfort and easy maintenance including the lowest VOC emission can be combined to fulfil the needs of the architecture design and the sustainable daily use.



Q-Park Dublin, Ireland

Project Description

Q-Park is an international parking company with good to strong market positions in many European countries. Q-Park is committed to provide customers with good looking, safe and well lit parking facilities. They are designed for easy parking with well defined and spacious parking bays. Sika systems were used in 2 carparks of Q-Park: Tallaght Cross Q-Park (Belgard Square East, Tallaght, Dublin) and Q-Park Clerys Car Park (Marlborough Street, Dublin)

Project Requirements

Q-Park Clerys Car Park was an extensive refurbishment project for Q-Park. Deteriorated concrete structure throughout the building including the decks needed to be repaired. Floors and walls were to be repainted to provide a protective, decorative and durable surface. The Tallaght Cross Q-Park was a new construction project.

Sika Solutions

Sika systems are the coatings of choice for all the Q-Park throughout Ireland. Deteriorated concrete was repaired with Sika concrete repair mortars and decks were made good with Sika levelling Mortar. 12'000 square meters of intermediate decks were finished with **Sikafloor®-358**, a tough, elastic, coloured epoxy flooring system, whilst the exposed deck was levelled and finished with **Sikafloor®-350** flexible decking system. All floor and wall coating systems were applied by Epowit flooring contractors to provide a decorative, protective finish that will ensure the future integrity and extend the life of the structure. The Tallaght Cross Q-Park was completed in two phases (three levels each phase) with 80'000 square meters of **Sikafloor®-263** intermediate deck coating being applied by the McLoughlin Group. They also applied 100'000 square meters of **Sikagard®-Elastocolor W** to the walls, columns and soffits.



Ealing Car Park London, UK

Project Description

Sika materials are being used exclusively on the refurbishment of Spring Bridge Road multi-storey car park, a 30 years old structure, to extend the life of, and give a lighter and safer environment to users of the car park.

Project Requirements

Cracks in the existing asphalt screed on the 3'000 m² top deck, had allowed water, contaminated with de-icing salts to penetrate both the concrete frame and the uncoated intermediate decks below. This had led to corrosion of the reinforcing steel in the carbonated concrete and subsequent delamination.

Sika Solutions

The asphalt screed from the top deck was removed, and **Sikafloor®-355**, a solvent free, elastic, polyurethane decking system was applied as a broadcast wearing layer. This was over coated with **Sikafloor®-354**, a flexible epoxy seal coat, to give a tough, waterproof, flexible surface with good colour stability and resistance to weathering. The three intermediate decks, each of 3'000 m², were prepared and coated with **Sikafloor®-261**, a durable, solvent free, epoxy resin, decking system. Repairs to all decks were carried out using **Sika®-Rapid Repair mortar**, a cementitious, fast setting mortar with high early strength. The soffits and pillars were repaired using the **Sika® MonoTop®** concrete repair system, and **Sika® FerroGard®-903** corrosion inhibitor was applied. **Sika® FerroGard®-903** impregnates the reinforced concrete to arrest the rate of existing corrosion, and give long term protection to the structure. **Sikagard®-ElastoColor® W**, an anticarbonation decorative coating was finally applied. This water based, crack-bridging protective coating, prevents water ingress, is resistant to frost and salts and is vapour permeable and extremely durable. Construction joints were replaced with **Sikaflex®-PRO 3 WF**.



Westside Multifunctional Mall Bern, Switzerland

Project Description

This impressive multifunctional centre is located to the west of the Swiss capital, Bern, and has 60 shops and boutiques, a multiplex cinema, 10 restaurants, a pool, spa and fitness areas, a hotel, a conference centre and a senior citizen home, etc.

Project Requirements

This complex extends across a motorway, so an existing highway tunnel had to be extended as part of the project. The technical, time and economic requirements were high. A lot of different parts of the complex needed different system solutions, e.g. basement, parking areas, storage and logistics areas, sanitary and pool areas, the steel structure, façade elements, the roof and so on.

Sika Solutions

Watertight concrete basement solutions: Sika® ViscoCrete® and **Sikament®** Superplasticiser for 90'000 m³ of concrete with excellent workability, reduced water cement ratio and better waterproofing properties; **Sika® Waterbar** for waterproofing joints; supervision and design support of the specialised waterproofing engineers from **Permaton®** wpc, Winterthur.

Corrosion and Fire Protection solutions for the Steel Structure: 16'000 m² of **SikaCor®** corrosion protective coating with attractive colours; **Sika Cafco®** system as fire protective sprayed rendering.

Flooring solutions for car park decks and logistics areas: total 50'000 m²; **Sikafloor® EpoCem®** moisture barrier for selected areas; elastified **Sikafloor®-390**; crack bridging **Sikalastic®-821** and **Sikafloor®-355** for where ground movements were expected; high performance **Sika Elastomastic® TF** system for areas of intense wear like entrance areas, ramps, etc.

Floor and Wall Coating solutions with attractive colours: 6000 m² of **Sikafloor®** coating with different colours for the pool area and walls and floors of the bathrooms.

Roofing solution: 25'000 m² of **Sarnafil®**, **Sucoflex®** roofing membranes.

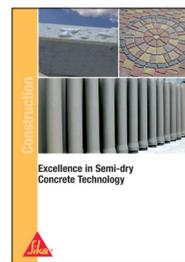
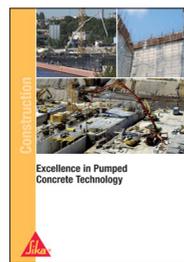
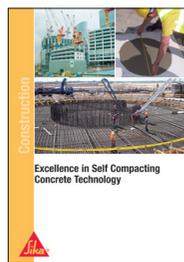
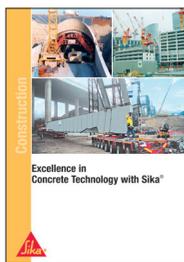
Structural glazing solution: Sikasil® SG-20, Sikasil® WS-605 S and others.

Close to your Business in any Part of the World



Sika is a globally active company in the speciality and construction chemicals business. It has subsidiary manufacturing, sales and technical support facilities in over 70 countries around the world. Sika is THE global market and technology leader in waterproofing, sealing, bonding, dampening, strengthening and the protection of buildings and civil engineering structures. Sika has more than 10,000 employees worldwide and is therefore ideally positioned to support the success of its customers.

Also Available from Sika®



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