VERSATILE BEDDING, JOINTING AND SEALING STREETSCAPE SOLUTIONS

BUILDING TRUST

SIKA® – YOUR IDEAL PARTNER

Our roads and pavements have to support more and more traffic, plus seemingly faster and heavier vehicles every day. The downtime for this essential infrastructure due to maintenance work leads to costly delays and diversions, causing increased congestion. The repair and maintenance work is also very expensive for the authorities and the tax payer.

For all of these reasons the use of efficient, durable materials is essential to reduce downtime and, wherever possible, to extend the maintenance cycle. Sika® listened to the market and has used the latest technologies together with our expertise, global experience and presence, to develop user-friendly, long-lasting bedding and fixing systems for all types of pavements and hard surfacing.

Sika® are proud to offer BS 7533 compliant products and systems, ensuring performance and durability for many years.

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ROADWORKS

FOR THE CORRECT DESIGN AND CONSTRUCTION of roads and pavements, as well as for all subsequent repair and maintenance works, the selection of the right materials is essential. Urbanisation and increases in both vehicular and pedestrian traffic, means that our towns and cities have become very busy and there is limited tolerance for the inconveniences that road-works create.

Any construction works, new or maintenance, must therefore be finished as quickly as possible to reduce downtime. On the other hand, durable solutions are the main key to avoiding and/or reducing future works, as well as saving money overall. Sika® has designed a range of system solutions specifically for roadworks that can fulfil all of these demanding requirements. The Sika® Streetscape and Highway Ranges also meet the highest demands of all the relevant standards.

It comprises:

- Special designed mortars for bedding and fixing manhole frames and utility boxes
- Fast-setting bedding mortars for natural stone, concrete paving and kerbs
- Durable pavement jointing mortars
- Easy to use, specifically formulated paving and fixing compounds

Sika® Streetscape and Highway Ranges: APPLICATIONS

MANHOLE FRAMES, UTILITY BOXES & DRAINAGE SYSTEM BEDDING AND FIXING



BEDDING AND LAYING KERBS, PAVERS, SLABS, FLAGS, BLOCKS AND SETTS



PAVING JOINT SOLUTIONS



FIXING STREET FURNITURE, ROAD SIGNS AND POSTS



ROADS AND PAVEMENTS: THE EXPOSURE

ROAD AND PAVEMENT STRUCTURES and their surfaces are subject to a wide range of exposure conditions with potentially aggressive and damaging influences. This exposure can be divided into three main types: physical, chemical and environmental, which will also affect all of the ancillary drainage or utility service manholes, connection boxes and any other embedded street services, furniture, etc.

1) PHYSICAL INFLUENCES

Vehicular traffic: Starting, stopping, accelerating and turning any type of vehicle, imparts significant load and stresses onto the road surfaces; obviously the heavier and faster the vehicle, the greater the load and stresses that result. Even just the weight of smaller vehicles can create ruts and potholes if the wrong materials are used, which then eventually leads to compressive failure of the sub-structure.

Mechanical cleaning and maintenance: Street cleaning machines with rotating brushes combined with high pressure jet washers are the most common method of cleaning our streets today. These actions also generate significant stress with abrasion and potential scouring of the joints and pavers.

2) CHEMICAL INFLUENCES

Accidental spillages: There is always the possibility of traffic accidents, or even just technical issues with vehicles that can cause fuels, oils or other hydrocarbon liquid spillages. There are also possible chemical spillages in pedestrian areas, including discarded or dropped rubbish and food waste. Prime examples are street markets where there will be fruit, vegetables and other foodstuffs spilled onto our pavements. All of this is effectively chemically attacking the road surfacing and joints.

De-icing salts: During winter, de-icing salts are often used to prevent ice forming on road and pavement surfaces. Unfortunately these salts create stress on the surfaces through freeze-thaw attack. In addition, because they dissolve in water, they also penetrate into any cracks, joints and permeable surfaces, where the damaging spalling action can also occur (salts carried in solution can result in chloride attack of reinforcement).

3) ENVIRONMENTAL INFLUENCES

Wide temperature variations: Road and pavement surfaces can be subject to a wide variation of temperatures between day and night in both summer and winter conditions, sometimes in excess of 30°C to 40°C (or even greater in extreme situations), These frequent wide cycles result in significant thermal stresses on the materials and causes movement in the joints that can all potentially result in cracks and allow damaging future water and salt ingress.

Water ingress: Water penetrates naturally to some degree through the capillary pore structure of concrete and cement based jointing mortars. If the substructure is not sound, stable and has adequate provision for drainage, this can also lead to leaching, washout, subsidence, etc, resulting in failure of the surfacing system and structures above.

There are also several other important design and construction factors that can result in damage to the structure and surfaces of our roads and pavements.
This damage can include: cracking, spalling and subsidence, which can develop:

- due to the wrong type or quality of materials,
- not respecting the need for movement or expansion joints,
- the wrong size or grade of paving blocks or stone,
- insufficient, inadequate or excessive space/joints between the paving units.

To avoid these problems and issues on your road and pavement projects, always work with a competent and experienced partner in this field, from the design through the installation to completion, including clear definition of the maintenance requirements and procedures.

Sika® is the ideal partner!


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MANHOLES AND UTILITY BOXES

COUNTLESS MANHOLES AND UTILITY BOXES are installed in almost every street in every city around the world. Often not really noticed by people passing by, they are essential to keep daily life running in every community. These manholes and utility boxes have to withstand all of the exposure and stress that is imparted on our roads and pavements. To ensure their durability and a long service-life with no or minimum maintenance, they must be produced from well proven and tested materials.

To fix manhole and utility box frames in the streets, the bedding and fixing materials need to be user-friendly and have excellent workability, to ensure quick and easy installation with the optimum results and durability.
The products must also be fast curing and selected to ensure rapid re-opening to traffic and to minimise disruption and disturbance to residents and road and walkway users.
Solutions with high durability will minimise the requirements for future maintenance and repair works, resulting in a safer environment for pedestrians and vehicles, and reducing whole-life costs. All of these important demands and requirements are met by the Sika® Streetscape and Highway ranges.

MINIMISE DOWNTIME: SIKA® OFFERS THE SOLUTION FOR FAST RE-OPENING TO TRAFFIC THROUGHOUT THE WHOLE YEAR, WHATEVER THE WEATHER.

PAVEMENTS

PAVEMENTS ARE TYPICALLY SEEN IN HISTORICAL CITY CENTRES and old town districts. They are used for aesthetic reasons and to support traffic. Choosing the right products for bedding and jointing is essential to prevent pavements becoming obstacles for pedestrians and bikers.

All trafficked pavements must also be designed and built to withstand their anticipated mechanical loads and their exposure in service:

- Dynamic deformation from the traffic (to prevent ruts)
- Vibration (excessive joint movement, cracking, settlement of the bedding or substructure)
- Shear forces from the traffic, especially heavy vehicles
- Tensile forces due to the breaking or acceleration of vehicles
- Spillages and leakages from the vehicles (fuels, oils, etc.)

Pavements also need to resist the environmental influences of weathering including heavy rain, the use of de-icing salts and freeze/thaw cycles.

All these important design criteria must be assessed and withstood by the bedding and fixing systems as well as by the paving and concrete structures as required.

COMMON FAILURES IN PAVED SURFACES :
The traditional methods of bedding and jointing with sand or sand and cement have now been shown to be inadequate and they do not last in modern urban situations. The most common reasons for paved surfaces failure include:

- **Settlement due to the static and dynamic loading from traffic.** The main reason for this type of failure is compaction of substructure or the wrong choice of bedding material and its compactability.
- **Cracking and loss of the jointing material and/or paving units.** This normally happens when the bond between the concrete blocks or stone setts and the substrate or the joint material itself, does not have enough tensile strength to withstand and accommodate the loads imposed.
- **Weed growth.** This is very common in old traditional pavements where just clean sand was used for jointing. This green growth is not only unsightly and far from being ecological, but it also leads to further cracking and debonding, reducing the durability and serviceability of the pavement even faster.


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Traditionally, paved surfaces were constructed by embedding setts or blocks onto a bed of compacted sand or a weak sand and cement mix. The joints between the pavers were then filled or pointed with the same or similar fine material. This method is more economical in the short term.

However, only limited slopes (i.e. <9%) are possible and due to the materials high permeability and low material stability, allowing relatively easy washout, it is not recommended for regions with heavy rain or any potential water run-off. The resistance to mechanical loads is also very dependent on the substructure and is very likely to suffer one or more of the types of failure listed previously (e.g. settlement, ruts, cracks, loss of bedding and jointing material from loading and washout) plus weed growth and boring insect attack, etc.

SIKA® SOLUTIONS

To avoid all of these problems, Sika® has developed the Sika® Streetscape and Highway ranges to improve the characteristics and performance of paved surfaces. These materials also reduce the necessary downtime after installation or corrective maintenance, before reopening, plus their durability increases both the overall service life and the time to next maintenance of the areas (reduced maintenance cycle).

BEDDING MORTAR

From Sika's experience and global market leading technologies for the new concrete construction and concrete refurbishment markets, we have developed a BS 7533 compliant paving block and sett bedding mortar that is also suitable for use in thicker layers, which compensates for the possible dimensional tolerances of the paving units. Sika® offers fast setting bedding mortars that allow the paving joint mortar grouting to follow after only 24 hours. They are designed to withstand high loads and due to its high performance can also be used for fast patch repair works on concrete roads and other surfaces.

PAVING JOINT MORTAR / GROUT

It is essential not to underestimate the importance of the jointing mortar in paved surfaces. Mortars, besides fixing the pavers firmly in position and giving the right aesthetic finish to the area, also protects the bedding mortar from plant roots, from abrasion by mechanical cleaning machines and from accidental spillages of oils and fuel from vehicles or other aggressive chemicals. Typical applications include:

- Paving joints in roads, defined traffic lanes and other pavements
- Paved driveways to residential and commercial buildings
- Town centres and market squares

Parex Granatech and Parex Granatech 40 Fine (both of which comply with the relevant sections of BS 7533) harden sufficiently to allow pedestrian traffic after only 2 hours, and vehicular traffic after 24 hours. They have outstanding freeze-thaw resistance, and as they can be regarded as impermeable, they protect and ensure the stability of the bedding and substructure below, preventing washout.

FIXING AND BEDDING STREET FURNITURE

There are many different Sika® products and systems available from which to select the best solutions to fix the wide range of different street furniture, road signs and anything else that needs to be fixed and sealed into the pavement and/or the substructure. Sika® uses all of the latest cement and resin technologies to produce this range of products and systems.

Extensive testing and development ensure that you can meet all of the different requirements regarding load accommodation, dimensions, exposure, rate of hardening and compatibility, etc. The best known Sika® brands in this portfolio, in addition to the Sika® Streetscape and Highway ranges, include: SikaGrout®, Sikadur®, Sika® AnchorFix® and Sikaflex®.

CASE STUDIES

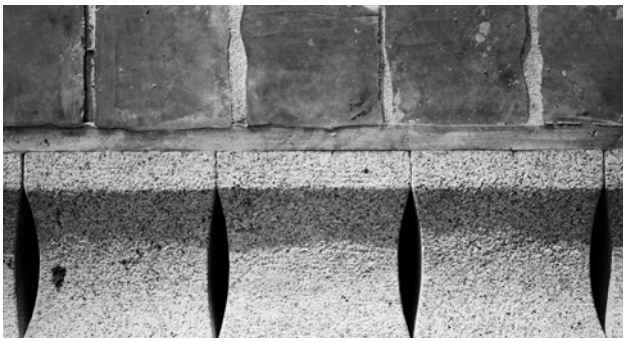
MAIN TRAMLINE, BREST, FRANCE

PROJECT DESCRIPTION
During the construction of the first tram line in Brest in 2012, the project included aesthetic improvement of the public space, creating pedestrianised areas, bike lanes and a new street design in three main areas: Place de Strasbourg, Place de la Liberté and Place des Français Libres.

PROJECT REQUIREMENTS
Durable and extremely resistant products were required to bed the replacement granite setts that would have to withstand heavy traffic loads. Also, due to the unevenness of the ground and substructure, a mortar capable of being used in variable and thicker layer thicknesses was required.

PROJECT PARTICIPANTS
Client: Brest Métropole Océane (SEMTRAM)
Consulting Engineers: Groupement Teo
Contractor: Marc SA; Eurovia; Jardin Service

BUDAPEST CASTLE, HUNGARY



PROJECT DESCRIPTION
Refurbishment of the Castle access road started in 2013 and the project was divided into 4 phases. The historic road pavement was also refurbished using similar natural stone setts and this had to be done so that the new paved surface would be more resistant to frequent modern vehicular traffic.

PROJECT REQUIREMENTS
Highly durable paving bedding and jointing products were required to give improved performance over the traditional existing system. Improved aesthetics were also essential in the historic city, with ease of cleaning and low maintenance.

PROJECT PARTICIPANTS
Contractor : Penta kft. Hungary

ROYAL MILE, EDINBURGH, UNITED KINGDOM

PROJECT DESCRIPTION
Major road reconstruction works were required in the Canongate area of the center of Edinburgh. Due to the heavy traffic loadings from frequent buses and other heavy vehicles, the roadway originally paved in traditional methods with granites setts had become loose and uneven.

PROJECT REQUIREMENTS
To retain the historic look and feel of the roadway, the existing granite setts were lifted and cleaned and then they had to be re-laid, with any damaged ones being replaced with similar stone.

SIKA® SOLUTION
The refurbished setts were laid on a bed of fine aggregates and then the high flow slurry applied grout was applied to fill and seal the joints. It flows readily through and around the setts and into the bedding layer to create a strong monolithic structure with a durable surface.

PROJECT PARTICIPANTS
Client: Edinburgh City Council
Contractor: Land Engineering

LÁNCHÍD STREET, BUDAPEST, HUNGARY

PROJECT DESCRIPTION
Refurbishment of the paved street surface that had been damaged over the years by the continuous traffic, including frequent buses and other heavy commercial vehicle running over it.

PROJECT REQUIREMENTS
Restoration of the pavement without losing the historic aesthetics and appearance of the finish. Long durability required. Low maintenance.

PROJECT PARTICIPANTS
Contractor: Swietelsky Magyarország Kft.

FOR MORE INFORMATION ON SIKA® REFURBISHMENT SYSTEMS AND SOLUTIONS:

WE ARE SIKA®

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

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

Contact
Phone 0800 112 3863
E-Mail constructionsolutions@uk.sika.com
www.sika.co.uk
@SikaLimited
@Sika

SIKA IRELAND LIMITED
Sika House
Ballymun Industrial Estate
Dublin 11
D11 DA2V
Ireland

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

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