



# REFURBISHMENT

Sika<sup>®</sup> FastFix SOLUTIONS FOR  
PAVING, MANHOLE FIXING AND  
OTHER ROADWORKS





# 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.

For all of these reasons the use of efficient, durable materials is essential to reduce downtime and where 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.

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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. Urbanization 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 roadworks 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, and also to saving money overall. Sika has designed a range of system solutions specifically for roadworks that can fulfil all of these demanding requirements. The Sika® FastFix range also meets 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® FastFix RANGE: APPLICATIONS

## MANHOLE FRAMES, UTILITY BOXES & DRAINAGE SYSTEM BEDDING AND FIXING



## BEDDING AND LAYING KERBS OR PAVING BLOCKS



## PAVING JOINT SOLUTIONS



## FIXING STREET FURNITURE AND TRAFFIC SIGNS



# 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 and furniture etc.

## 1) PHYSICAL INFLUENCES



**Vehicular Traffic:** Starting, stopping, accelerating and turning any type of vehicle, imparts significant load and stresses into 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 those uncomfortable 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 in 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, such as street markets, there will also be fruit, vegetables and other foodstuffs spilled onto our pavements. All of this is effectively making a chemical attack on the road surfacing and joints.



**De-icing salts:** During winter common salt are frequently used as so-called de-icing salts, to prevent ice forming on road and pavement surfaces. Unfortunately these salts create stress on the surfaces through freeze-thaw attack. Also because they dissolve in water, they also penetrate into any cracks, joints and permeable surfaces, where the damaging spalling action can also occur.

## 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 more in extreme situations, with similar variances also possible during the day with sudden rainfall or hailstone showers, etc. These frequent wide cycles result in significant thermal stress 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, wash-out and 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!







# 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 to 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 must also be user-friendly and have excellent workability, in order 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 thereby to also minimize any disturbance to normal life in the street.

Solutions with high durability will minimize the requirements for future maintenance and repair works, resulting in a safer environment for pedestrians and vehicles. All of these important demands and requirements are met by the Sika® FastFix range.

**MINIMIZE DOWNTIME:  
SIKA OFFERS THE SOLUTION FOR  
FAST RE-OPENING TO TRAFFIC  
DURING THE WHOLE YEAR.**





# SIKA SOLUTIONS

## Sika® FastFix-138 TT FIXING AND BEDDING MANHOLES AND UTILITY BOXES

A cementitious bedding and fixing mortar which is specially designed for the installation of manholes and street utility boxes frames. Thanks to its fast-setting and high workability, the product is also the ideal choice for small patch repairs in almost any hard surfaces on roads or commercial and industrial paved areas. It is also often used to bed and fix street furniture. All of this with just one product, simplifying your logistics and the works on site. Thanks to its advanced technology, Sika® FastFix-138 TT has also been designed for use in a wide range of temperatures without significantly increasing its setting time or reducing any of its handling characteristics, or its subsequent mechanical performance properties and durability.

One of the outstanding characteristics of Sika® FastFix-138 TT is its development of high resistance within the first two hours, allowing early re-opening to traffic, and this without losing workability for ease of application during the first 20 minutes after mixing. This new Sika mortar technology also allows the stated technical properties and performance to be achieved in all ambient temperatures. Sika® FastFix-138 TT is able to set at 5 °C and 30 °C with almost no change in the rate of hardening. This also means that unlike other materials, no warm or cold mixing water is required at lower, respectively higher temperatures; an extremely useful and significant advantage for many different projects and requirements, being non-dependent on their location, time or season.

### APPLICATION



Placing Sika® FastFix-138 TT as a bedding mortar - mixed to a semi-dry consistency. Adjusting the final level of the manhole frame.



Pouring Sika® FastFix-138 TT to grout the manhole frame in position - mixed to a pourable consistency.



Finishing of Sika® FastFix-138 TT before it hardens.

# PAVEMENTS

**PAVEMENTS ARE TYPICALLY SEEN IN HISTORICAL CITY CENTERS** and old town districts. They are used for aesthetic reasons and to support traffic. Choosing the right products for bedding and jointing is essential in order not to turn pavements into obstacles for pedestrian 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 braking 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 and 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 not be durable 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 more ecological, but it also leads to further cracking and debonding, reducing the durability and serviceability of the pavement even faster.









The paved surfaces were created by embedding the setts or blocks on a bed of compacted sand or a weak sand and cement mix, then the joints between the pavers are filled or pointed with the same or similar fine material. This was the traditional method and is clearly very economic in the short-term.

However, only limited slopes (< 9 %) are possible and due to the materials high permeability and low material stability, allowing relatively easy wash-out, 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 the bedding and jointing material from dynamic load and washing out, plus weed growth and boring insect attack etc.





# SIKA SOLUTIONS

To avoid all of these problems, Sika has developed the Sika® FastFix range that improves 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).

## Sika® FastFix-134 TP BEDDING MORTAR

From Sika's experience and global market leading technologies for the new concrete construction and concrete refurbishment markets, we have developed a 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® FastFix-134 TP is a fast setting bedding mortar that allows the paving joint mortar grouting to follow after only 24 hours. It is 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.



## Sika® FastFix-133 TP PAVING JOINT MORTAR / GROUT

It is essential not to underestimate the importance of the jointing mortar in paved surfaces. This mortar, 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

Sika® FastFix-133 TP hardens sufficiently to allow pedestrian traffic after 24 hours and vehicular traffic after 48 hours. It has outstanding freeze-thaw cycle resistance. Additionally due to its waterproofing properties, it protects and ensures the stability of the bedding mortar and the substructure below, preventing wash-out below the paved surface.



## Sika® FastFix-131 JOINTING COMPOUND

It is a specially formulated, polymer modified sand for paving joints. The joints become more resistant, wash-out is greatly reduced and slopes are possible as it is required in high rainfall areas.

Where increased flexibility is required, Sika® FastFix-131 treated sand jointing is usually the most suitable system, as the polymer modifies the sand to a stable compound that

produces a flexible and durable finish when cured. Due to the enhanced performance with Sika® FastFix-131, the paving will have very significantly less damage from plant roots and weed growth or boring insects, thereby increasing the durability of the surface. It also develops sufficient mechanical resistance to allow cleaning by controlled jet-washing, once the material has fully cured.



### APPLICATION



1. Pour out small amounts of Sika® FastFix-131 powder



2. Brush into the joints



3. Compact well into the joints using a suitable Wacker-Plate, or simply use a wooden level and hammer.



4. Saturate the surface and the joints with water using a hose or watering can.



## 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® FastFix range, include: SikaGrout®, Sikadur®, Sika AnchorFix® and Sikaflex®.



# Sika® FastFix PRODUCTS

## AT A GLANCE

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### Sika® FastFix-138 TT

#### FAST SETTING BEDDING/FIXING MORTAR

is ideal for fast, cost-effective work in road construction and maintenance:

- Manhole frame bedding/fixing
- Gully grid bedding and fixing
- Utility/telecom supply box installation
- Street furniture
- Traffic signals and signs
- Road joint repairs
- Smaller patch repairs in road surfaces

#### ADVANTAGES

- Fast re-opening to traffic (2 hours at any temperatures between 5 °C and 30 °C)
- Excellent de-icing salt resistance increases durability
- Very good placing properties
- Adjustable consistency
- Can be extended with additional clean aggregates for larger volume bedding work
- Black color to match asphalt
- Good adhesion to concrete, stone and asphalt
- 1-component

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### Sika® FastFix-134 TP

#### FAST SETTING PAVING BEDDING MORTAR

is ideal for bedding paving units for roads and pavements with medium to high loading requirements/frequent and heavy traffic:

- Car parks and driveways
- Pedestrianized areas/streets
- Town centers and market squares
- Historical and conservation area
- Small patch repairs in concrete roads surfaces

#### ADVANTAGES

- Fast setting without cracking
- High freeze/thaw resistance increases durability
- Excellent resistance to impact increases service life
- Good resistance to hydrocarbon oils
- Very good placing properties
- Good adhesion to concrete and stone
- 1-component

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### Sika® FastFix-133 TP

#### FAST SETTING PAVING JOINT MORTAR

is ideal for use in both new construction and the refurbishment of concrete and stone paving on roads and other pavements:

- Roadways
- Car parks and driveways
- Pedestrianized areas/streets
- Historical and conservation areas

#### ADVANTAGES

- Fast setting without cracking
- High freeze/thaw resistance increases durability
- Excellent resistance to impact and abrasion increases service life
- Good resistance to hydrocarbon oils
- Very good placing properties
- Good adhesion to concrete and stone
- 1-component

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### Sika® FastFix-131

#### POLYMER MODIFIED SAND FOR PAVING JOINTS

is a suitable pavement jointing compound for joints between 2 and 12 mm with all types of paving unit for applications including:

- Residential driveways
- Pedestrianized areas/streets
- Gardens, landscaping
- Town centers and market squares
- Private and commercial patios

#### ADVANTAGES

- Can be walked-on right after the application. No need to wait
- Faster to apply than traditional sand jointing
- Easy to apply
- Joints do not crack over time – increases durability
- Sets hard, the joints will not wash out under normal rainfall
- Good resistance to weed growth and insects
- 1-component



## SIKA ROADWORKS PRODUCT GUIDE

Uses	Sika® FastFix- 138 TT	Sika® FastFix- 134 TP	Sika® FastFix- 133 TP	Sika® FastFix- 131	Sika Monotop®- range	SikaGrout®- 334	Sikadur® range
Manhole fixing at 5 °C	X	-	-	-	-	-	-
Manhole fixing at 30 °C	X	-	-	-	-	-	-
Utility box fixing	X	-	-	-	-	-	-
Drainage frame fixing	X	-	-	-	-	-	X
Block and sett bedding - thin layer method	-	X	-	-	-	-	-
Block and sett bedding - thick layer method	-	X	-	-	-	-	-
Semi-flexible jointing	-	-	-	X	-	-	-
Rigid jointing	-	-	X	-	-	-	-
Concrete kerb jointing	-	-	X	-	-	-	-
Concrete kerb repairs	-	-	-	-	-	X	X
Patch repairs in concrete roads	-	X	-	-	-	X	-
Drain channel fixing	-	X	-	-	-	-	-
Lamp post fixing	-	-	-	-	-	X	-
Bench fixing	X	-	-	-	-	X	X
Other small street furniture fixing	-	-	-	-	-	-	X

# 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 pedestrianized 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.

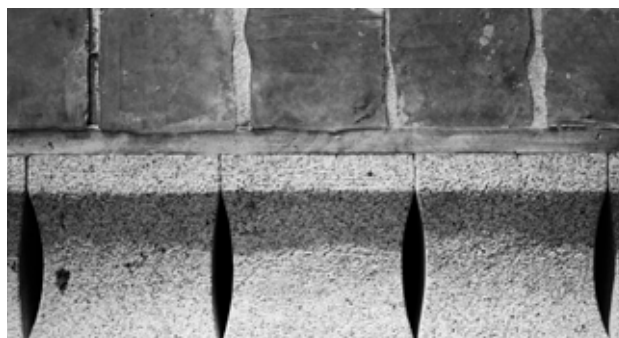
### SIKA SOLUTION

The bedding of the pavers was achieved using Sika® FastFix 134 TP, and then Sika® FastFix 133 TP was used for the paving jointing. To seal the system, Sikaflex® Pro 3 WF a permanently elastic PU based joint sealant was used in the expansion / movement joints, and the street furniture was fixed in position using high performance Sikadur® resin systems.

### 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.

### SIKA SOLUTION

Sika® FastFix 134 TP (formerly Sika® FastFix 133 TP) was used for bedding the pavers, and then Sika® FastFix 133 TP paving joint mortar was used to grout and finish the surface for a good visual result with the historic natural stone pavers.

### PROJECT PARTICIPANTS

Contractor : Penta kft. Hungary



## ROYAL MILE, EDINBURGH, UNITED KINGDOM



### PROJECT DESCRIPTION

Major road reconstruction works were required in the Canon-gate 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 granite setts had become loose and uneven.

### PROJECT REQUIREMENTS

To retain the historic look and feel of the roadway. For this, the existing granite setts were to be 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 grout was applied to penetrate the aggregate. 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.

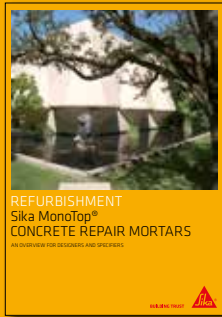
### SIKA SOLUTION

The bedding of the setts onto the refurbished substructure was done using Sika® FastFix 133 ECZ. Then the same material, Sika® FastFix 133 JCZ was also used as the grout for pointing the joints in the natural stone setts. For the perimeter and any other movement / expansion joints Sikaflex® Pro 3 was used.

### PROJECT PARTICIPANTS

Contractor: Swietelsky Magyarország Kft.

# ALSO AVAILABLE FROM SIKA



## 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.

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



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