CONSTRUCTION SOLUTIONS
DURABLE SOLUTIONS FOR BRIDGE REPAIR & MAINTENANCE

BUILDING TRUST

INNOVATIVE, COST-EFFECTIVE, AND SUSTAINABLE BRIDGE MAINTENANCE SOLUTIONS

Bridges have always held a significant place in history, valued both for their utility and engineering achievement. As integral components of infrastructure, they facilitate the efficient movement of people, goods, and livestock. By design, bridges are constructed in diverse locations where challenging topography, unstable ground, or existing structures make traditional roads, pathways, or railways impractical. As a result, they are often found in demanding and exposed environments – spanning ravines, encircling mountains, traversing valleys, lakes, rivers, seas, or integrating with urban landscapes.

However, with increasing traffic volumes and heavier design loads, bridges are subjected to growing stresses and strains, intensifying the demands placed upon them. Consequently, many of these structures require extensive – and often urgent – repairs and refurbishment.

SIKA – OVER A CENTURY OF BUILDING TRUST

With over 100 years of experience in constructing and refurbishing bridge structures, Sika delivers innovative and proven solutions across a broad product range. Sika's global expertise in construction chemicals, combined with consistent quality-controlled products and efficient logistics, ensures reliable outcomes. The dedication and expertise of Sika specialists enable the company to provide cost-effective, durable solutions tailored to bridge projects worldwide.

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ENSURING LONG-LASTING BRIDGES: DURABLE SOLUTIONS FOR REPAIR & MAINTENANCE

BEFORE DEFINING A COMPREHENSIVE STRATEGY for the construction, repair, and protection of a bridge, it is crucial to consider the specific project requirements. These requirements play a key role in determining the appropriate design, planning, and construction procedures, as well as the long-term maintenance measures necessary to extend the bridge's lifespan.

THE IMPORTANCE OF THE DESIGN PHASE

The design phase is critical in any structural engineering project, as it lays the foundation for ensuring the bridge's structural integrity, safety, and efficiency. During this stage, the correct selection of materials and a precise assessment of loads are essential for achieving optimized structural analysis and design. A well-executed design not only ensures the bridge performs as intended throughout its lifespan but also guarantees compliance with stringent safety and performance standards.

EXTENDING THE SERVICE LIFE WITH EFFECTIVE MAINTENANCE

To maximize the service life of a bridge, a proactive inspection and monitoring system should be integrated into the maintenance strategy. Preventive maintenance helps mitigate deterioration, ensuring the structure remains safe and operational for longer. Key factors to consider in an optimal maintenance plan include:

EXPOSURE AND SITE CONDITIONS
The bridge's location and exposure to environmental factors – such as extreme weather conditions, accessibility, and available space for repairs—directly impact maintenance requirements. Harsh climates, complex access points, or remote locations influence the selection of materials and repair methodologies.

AESTHETIC ISSUES
Many bridges are iconic landmarks that contribute to regional identity. Preserving their aesthetic appeal is an important aspect of maintenance planning, ensuring repairs and refurbishments maintain the original design and visual impact.

TRAFFIC FLOW MANAGEMENT
While traffic loads are analyzed during the design phase, they remain a decisive factor in planning maintenance schedules. Maintenance must be strategically scheduled to minimize disruptions, accommodate ongoing traffic, and align with safety regulations.

ENVIRONMENTAL REQUIREMENTS
With evolving environmental regulations, sustainable construction and repair practices are more important than ever. Selecting durable, high-performance materials helps extend maintenance intervals, reducing waste, demolition, and environmental impact.

ENSURING LONG-LASTING BRIDGES: DURABLE SOLUTIONS FOR REPAIR & MAINTENANCE

SELECTING THE RIGHT MATERIALS FOR LONG-TERM PERFORMANCE

Bridge remedial works can entail significant financial, environmental, and social costs. To minimize disruption and maximize service life, the materials used must offer superior durability and resistance to harsh conditions. High-performance solutions reduce the frequency of interventions, offering a more sustainable and cost-effective approach to bridge maintenance.

OPTIMIZING BRIDGE LIFE CYCLE MANAGEMENT

A strategic life cycle management approach is essential for preserving investment, ensuring safety, and maintaining functionality. Effective life cycle planning helps bridge owners:

- Reduce closure times and disruptions
- Increase intervals between repairs
- Avoid costly emergency repairs
- Lower environmental impact by reducing material waste
- Ensure compliance with safety regulations

By adopting a strategic approach, engineers and asset managers can ensure bridges remain functional, safe, and cost-efficient for decades.

Sika provides innovative solutions and proven systems that optimize maintenance intervals and reduce life cycle costs – both economically and environmentally. Our expertise ensures bridges remain safe, functional, and resilient for generations to come.

SIKA – ENHANCING CUSTOMER VALUE AND REDUCING ENVIRONMENTAL IMPACTS

One of our key pillars is enhancing customer value while reducing environmental impacts. Our goal is to provide innovative and effective solutions that fulfill all technical requirements while keeping our environmental footprint as low as possible.

QUICK SIKA SOLUTION – NAVIGATION GUIDE BY BRIDGE MAIN ELEMENTS

FOUNDATIONS:

Often hidden after construction, a bridge's foundation plays a crucial role in bearing all loads and transferring them into the ground. Therefore, selecting the appropriate foundation type and the correct construction system is essential. This system must consider the type of soil the foundation will be in contact with – especially in aggressive environments or areas with seawater infiltration, which can reduce durability or cause excessive movement due to ground settlement.

BRIDGE PIERS:

Reinforced concrete is the most common material used for bridge piers, offering advantages such as low cost, wide availability, and ease of construction. However, it faces challenges such as cracking, spalling, scaling, erosion, and reinforcement corrosion – primarily caused by chlorides (from de-icing salts or marine environments), freeze-thaw cycles, and carbonation.

BEARINGS:

Bridge bearings are essential for the stability and longevity of bridges. These components absorb movement, distribute loads, and protect the structure from damage caused by traffic, temperature changes, and even seismic activity.
Regular maintenance is key to preventing costly failures and ensuring long-term performance. Deterioration can be accelerated by water infiltration, pollution, or incorrect specifications. When degradation occurs, a correct replacement process is necessary to minimize downtime and restore performance.

GIRDERS, BEAMS:

Beams and girders are the backbone of a bridge's superstructure, bearing heavy loads and transferring forces to the foundation. Exposure to harsh environmental conditions, increasing traffic loads, and unexpected hazards can compromise their integrity. With proper repair and protection strategies, these elements can remain structurally sound, ensuring bridge safety and long-term durability.

BRIDGE DECK:

Bridge decks provide the main pathway for vehicles, pedestrians, and trains. Constant exposure to weather conditions and traffic accelerates deterioration, potentially leading to significant disruptions. Identifying and addressing root causes early through targeted preventative measures enhances structural integrity and ensures smooth, safe transit for years to come.

JOINTS:

Bridges require various types of joints for durability and performance, with expansion joints being among the most critical. They accommodate movement caused by temperature changes, traffic loads, seismic activity, and structural shifts. Over time, expansion joints degrade due to heavy traffic and environmental conditions, necessitating timely inspection and replacement to ensure safety and comfort for users.

ABUTMENTS AND WING WALLS:

Like piers, abutments transfer loads from the bridge superstructure to the foundation. However, they are susceptible to challenges such as structural instability, foundation undermining from scour, drainage failures, water accumulation, exposure to weather, vehicle loads, impacts, and vandalism. Ensuring proper design and maintenance is crucial to maintaining overall bridge stability.

ANCILLARY ELEMENTS:

Streetlights, traffic lights, and signage structures are vital for safe bridge use. Though typically anchored to pier caps or parapets, they are exposed to weathering, impacts, and vandalism. Using the right materials and anchoring methods ensures the longevity and safety of these components.

SIDEWALKS AND MAINTENANCE LANES:

These elements protect pedestrians and cyclists, offering safe passage across bridges. They are subject to the same weathering and chemical exposure as other bridge components – especially from de-icing salts and vehicle spillages. Proper overlays must be chemically resistant, slip-resistant, and flexible to accommodate movement, ensuring long-term durability.

RAIL SYSTEMS FOR RAILWAYS SYSTEMS:

Rail systems are critical to modern transportation. Their integrity depends on proper fixing systems that secure rails to sleepers or slabs while absorbing vibrations and withstanding heavy loads and environmental conditions. Maintaining these systems is essential for safe, long-lasting infrastructure.

QUICK SIKA SOLUTION – NAVIGATION GUIDE BY BRIDGE MAIN ELEMENTS

Bridge element	Main exposures	Main deterioration causes
Foundation	Aggressive soils or water infiltration due to erosion, ground settlement, seismic activity	Chemical attack from aggressive soil particles, salt expansion, erosion/abrasion, concrete cracking from excessive movement
Piers	Temperature variations, chloride exposure (marine or de-icing salts), weathering, traffic impacts, vibrations	Surface scaling due to erosion, abrasion, salt expansion, cracking from movement or loads, carbonation, vandalism
Bearings	Loads, water infiltration from damaged joints, chemical pollutants	Overloading, corrosion, failure of anchors or bearing zones
Girders/Beams	Temperature variations, de-icing salts, marine environments, water ingress, traffic actions and vibrations	Scaling, erosion, salt expansion, de-icing salts, freeze / thaw cycles, impacts, cracking from loading or fatigue, carbonation
Decks	Temperature variations, de-icing salts, marine environments, water ingress, traffic actions and vibrations, pollutants	Scaling, erosion, salt expansion, corrosion of reinforcement bars, freeze/thaw cycles, impacts, cracking from loading or fatigue, carbonation, chemical attacks
Joints	Weathering, excessive movements, traffic loads, pollutants due to de-icing salts or spillages from vehicles, settlements, water ingress due to leaking joints	Ageing of the elastomeric elements, cracking of the nosing material, excess of traffic loads, corrosion of metallic elements, breaks due to excessive movements, vandalism
Abutments and wing walls	Temperature variations, de-icing salts, marine environments, water ingress, traffic actions and vibrations, pollutants	Scaling, erosion, salt expansion, de-icing salts, freeze / thaw cycles, impacts, cracking from loading or fatigue, carbonation, vandalism
Ancillary elements, like street lamps, hand rails, signals, traffic lights	Loads, vehicles, temperature variations, weathering, vibrations and other settlement movements, human actions	Traffic impact damages, corrosion, aging, cracking due to settlements, vandalism
Sidewalks, maintenance lanes	Loads, vehicles, temperature variations, weathering, vibrations and other settlement movements, human actions, pollutants	Traffic impacts and spillages, erosion, excessive loads, corrosion, aging, corrosion, concrete cracking
Rail systems for railway bridges	Loads, vibrations and dynamic loads, settlements, displacement of ballast, car traffic in road intersections, pollutants	Wearing, corrosion due to stray electric currents, excessive movements, fatigue of components, erosion, wear, chemical attack
Predictive methods	Corrosion and carbonations	Corrosion of reinforcement bars

Bridge element	Sika solution	
Foundation	**Protective sheets:** SikaShield® **Protective membranes:** SikaProof® A+	**Structural injections, soil stabilization:** SikaInject®, Sikadur®
Piers	**Concrete repair and protection systems:** Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic®	**Structural strengthening systems:** Sika® Carbodur®, SikaWrap®
Bearings	**Grouting and fixing systems for the replacement:** Sikadur®-42+ series, Sikacrete® UHPC range, SikaGrout®-340+	**Bearings:** Wabo®
Girders/Beams	**Concrete repair and protection systems:** Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic®	**Structural strengthening systems:** Sika® Carbodur®, SikaWrap® **Structural crack repair:** Sikadur®
Decks	**Concrete repair and protection systems:** Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic® **Structural strengthening systems:** Sika® Carbodur®, SikaWrap®	**Structural crack repair:** Sikadur® **Deck waterproofing systems:** Sikalastic®, SikaShield®
Joints	**Complete joint systems:** Wabo® joints, Sikaflex® Pro 3 Purfoam, Sikadur-Combiflex® system	**Nosing systems:** WaboCrete®, Sikacrete® UHPC range, SikaEmaco® T1400 FR
Abutments and wing walls	**Concrete repair and protection systems:** Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic® **Structural strengthening systems:** Sika® Carbodur®, SikaWrap®	**Structural crack repair:** Sikadur® **Soil stabilization or waterproofing:** SikaInject®
Ancillary elements, like street lamps, hand rails, signals, traffic lights	**Grouting and fixing solutions:** Sika AnchorFix® range, Sika FastFix®-136 Road, SikaEmaco® T1200 PG, SikaGrout® range	**Protection:** Sikagard®
Sidewalks, maintenance lanes	**Paving range:** Sika Fastfix® range, Sikafloor® solutions, Sikacrete® UHPC range	**Structural crack repair:** SikaInject® and Sikadur® range **Waterproofing systems:** Sikalastic®, SikaShield®
Rail systems for railway bridges	**Fixing and grouting systems:** Sika® Icosit® KC range, Sikadur® range, SikaGrout® range **Electrical Insulation system:** SikaShield®, Sika® Icosit® KC	**Ballast bonding systems:** Sika® Icosit® KC TrackFix **Sealing systems:** Sika® Icosit® KC, Sikaflex®
Predictive methods	**Monitoring system:** DuraMon® sensors	

KEY EXPOSURES – UNDERLYING CAUSES OF BRIDGE DAMAGE AND DETERIORATION

BRIDGES ARE CONTINUOUSLY EXPOSED to environmental and operational stressors, each contributing to structural degradation. A thorough understanding of these factors is essential for developing effective maintenance strategies and selecting the right materials to prolong service life.

FOUNDATION AND SUBSTRUCTURE SETTLEMENT

SOIL EROSION AND SCOURING:
Water infiltration can cause soil erosion under foundations, abrade concrete elements, and destabilize the ground, resulting in excessive movement, structural cracks, and reduced load-bearing capacity.

SEISMIC ACTIVITY:
Earthquakes or ground settlement vibrations can displace piers and abutments, causing cracks and spalling in concrete structures.

AGGRESSIVE SOIL:
Chemicals, salt expansion, and pollutants (including those from vehicle spillages) can attack foundations, causing cracking and weakening of structural components.

CONCRETE CRACKING AND SPALLING

WIDE VARIATION OF TEMPERATURES, FREEZE / THAW CYCLES:
By their nature and locations, bridges are subjected to a wide variation of temperatures between day and night/winter and summer conditions, or between different sides or surfaces of the structure. These frequent cycles result in thermal stresses and movement in the concrete structure that can also result in cracks. The freeze thaw process creates stresses in the concrete matrix due to the expansion of free water in the capillary pores during freezing conditions; this can result in scaling of the surface of poor-quality concrete. This action is also greatly accelerated by the presence of chlorides in the water.

ALKALI-SILICA REACTION (ASR):
Certain aggregates in concrete react with moisture and alkalis, causing internal swelling and cracking of the concrete.

LOAD-INDUCED STRESSES:
Overloading-whether from increasing traffic, inadequate design, impact damage, or seismic effects – can exceed the structural limits, leading to fatigue, deformation, or failure.

EROSION OR ABRASION:
Concrete elements submerged in water, such as piers or columns, face constant erosion and abrasion from fast-moving water and suspended particles, gradually wearing away the surface.

CORROSION OF REINFORCEMENT AND STEEL STRUCTURES

CHLORIDE INGRESS:
Chlorides from de-icing salts or seawater can penetrate concrete and disrupt the passive film protecting reinforcement bars, leading to aggressive pitting corrosion.

WEATHERING:
Carbon dioxide in the air reacts with calcium hydroxide in concrete, reducing the pH and ultimately compromising steel protection as carbonation progresses inward.

MOISTURE EXPOSURE:
Water naturally penetrates concrete through its pores. In areas with high chloride content or carbonation, this leads to corrosion of reinforcement, causing cracks and spalling.

BEARING AND EXPANSION JOINT FAILURES

JOINT COMPONENTS AGING:
Rubber, steel, and other joint materials degrade over time, resulting in misalignment, deformation, and performance issues.

DEBRIS AND WATER INFILTRATION:
Blocked or damaged joints allow water and debris to accumulate, accelerating corrosion and deterioration.

WATER LEAKS:
Leaks from failed joints or deteriorated waterproofing systems on decks can affect other bridge components below.

EXCESSIVE TRAFFIC LOADS:
High stress from constant vehicle movement deforms joints and bearings, compromising bridge movement capacity.

MAIN FAILURES IN RAIL FASTENING SYSTEMS IN BALLASTLESS TRACKS

WATER INFILTRATION:
Leaks can lead to several types of damage, including corrosion of fastening system components, reduction or complete loss of system resistance, corrosion of steel elements within the track structure and substructure, saturation of concrete with water, and eventual spalling.

ELECTRICAL INSULATION FAILURE:
Failures in the electrical insulation of the rail fastening system can result in false readings from track signaling systems, induction and acceleration of electrochemical corrosion, and the generation of stray currents. These stray currents, in turn, can further corrode the rail and nearby components.

DYNAMIC LOADS:
Repeated dynamic loading may cause cracking in adjacent concrete areas or deformation of embedded steel elements, compromising structural integrity.

EXPOSURE TO CHEMICAL POLLUTANTS:
Chemical attacks may occur due to the operating conditions of rolling stock or the specific location of the fastening system, such as near fuel transfer stations, chemical plants, or train washing facilities.

LOSS OF RESILIENCE IN PADS (GROUT OR RAIL PADS):
A reduction in the elasticity or load-absorbing capacity of these components can result in improper load distribution, leading to increased stress and accelerated deterioration of the track system.

EFFECTIVE BRIDGE MAINTENANCE AND REPAIR SOLUTIONS: SUSTAINABLE AND INNOVATIVE RESTORATION APPROACHES

THE FUTURE OF SUSTAINABLE BRIDGE RESTORATION

BY INTEGRATING HIGH-PERFORMANCE MATERIALS, smart monitoring, and green solutions, bridge restoration efforts can become more efficient, cost-effective, and environmentally responsible. These innovations not only extend infrastructure lifespan but also contribute to sustainable development and resilience against climate challenges.

CONCRETE REPAIR AND STRENGTHENING SOLUTIONS

Sika provides an extensive range of thoroughly tested and proven repair materials and systems, based on various technologies to meet specific requirements. These include bonding and corrosion protection primers, hand- and machine-applied repair mortars (suitable for vertical and overhead applications), semi-fluid mortars for efficient deck repairs, and surface levelling/protection mortars. Additionally, Sika has pioneered the development of carbon fiber-reinforced polymer structural strengthening systems.

Thanks to years of research and decades of hands-on experience, Sika has developed a fully comprehensive product range to restore and rehabilitate concrete bridges in a durable and sustainable way.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Steel Reinforcement Corrosion Protection	Sika MonoTop®-1010	1-component cement-based product with high resistance to water and chloride penetration, reduced carbon footprint
	SikaTop® Armatec® 110 EpoCem®	3-component, high performance corrosion protection primer using epoxy-cement technology
Concrete Repair Mortar	Sika MonoTop®/SikaEmaco®/ Sikacrete®	High performance cement-based repair mortars for hand or machine application with reduced carbon footprint options
Structural Strengthening	Sika® CarboDur®	Epoxy resin-based strengthening systems using carbon fiber and other composite materials
	SikaWrap®	Strengthening of reinforced concrete structures with fiber fabrics
Structural Crack Repair	Sikadur®/SikaInject®	2-component, solvent-free, low-viscosity epoxy resins with structural properties

PROTECTIVE COATINGS AND CORROSION MITIGATION

Sika offers a wide range of tested and proven concrete protection systems based on various technologies, including hydrophobic impregnations, rigid/elastic coatings, galvanic anodes, and corrosion inhibitors. All solutions comply with relevant international standards and regulations.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Steel reinforcement corrosion protection	Sika® FerroGard®-903 Plus	Organic, cost-effective service life extension against carbonation
	Sikagard®-8500 CI	1-component dual-phase surface applied corrosion inhibitor for long-term protection against both carbonation and chloride induced corrosion
	Sika® FerroGard®-300's Duo	Anode with initial current applied to it- for stronger cathodic protection
	Sika® FerroGard®-500's Patch	Sacrificial anode to prevent 'Halo' effect connected to rebar during patch repair
Protective Coating	Sikagard®-675 W ElastoColor	Acrylic resin-based waterproof coating offering excellent carbonation protection
	Sikagard®-5500	Highly elastic, crack bridging, waterproof concrete protection
	Sikagard®-Anti graffiti system	Semi-matt, permanent protection system which allows a cleaning with cold low water pressure or just with cold water and a cloth or scrubbing brush
Hydrophobic Impregnation	Sikagard®	Silane/siloxane based systems to repel water from concrete and other mineral surfaces

EXPANSION JOINT AND BEARING REPLACEMENT

Sika provides a complete range of customized expansion joint systems tested and with a well proven track record. Additionally, Sika provides a comprehensive range for fixing and bedding road and rail elements required for a durable and safe use of the bridge.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Expansion joints	Wabo®	High performance customizable joints systems designed to absorb bridge movements
Nosing / Headers Bearings repairs and Replacements	WaboCrete® II	2-component polyurethane header with specialty aggregate used to absorb and disperse traffic impact loads
	Emcrete II	Flexible, rapid setting, self levelling, impact absorbing elastomeric concrete used to fill blockouts, impact-absorbing backfill nosing, patching potholes and spalls on concrete roadways and bridges
	SikaGrout®-340+	1-component cementitious grouting mortar with shrinkage compensation and high strength development suitable for dynamic loads
	Sikadur®/SikaFlow®	High performance precision resin grouts based on various chemistries for high durability and excellent mechanical strengths, used to secure elements for proper alignment and transmission of static and dynamic loads induced by vibrations or seismic actions
	Sika Fastfix®/SikaEmaco®	Cementitious rapid hardening bedding and fixing mortar for road maintenance works

WATERPROOFING AND DRAINAGE ENHANCEMENTS

Given the open nature of bridge decks, it's crucial to prevent water ingress. Proper waterproofing of the deck is essential to prevent water damage and extend the structure's lifespan. This protection also safeguards critical areas beneath, ensuring a safe and reliable environment for all users.

Sika offers a complete range including liquid-applied membranes (LAM) which are highly elastic and flexible polymeric systems, bituminous sheets and cementitious polymer modified mortars that meet all the latest quality standards.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Bituminous sheets	SikaShield®	Bituminous waterproofing membrane sheets for bridge deck waterproofing
Liquid applied membranes	Sikalastic®-851 System	Polurethane-based waterproofing multi-layered system suitable for mastic and hot rolled asphalt schemes, certified under ETAG 033 and BBA HAPAS
	Sikalastic® Bridge 5000	Polurethane-based waterproofing multi-layered system suitable for mastic and hot rolled asphalt schemes, certified under ETAG 033
	Sikalastic®-2304	Polurethane-based waterproofing multi-layered system suitable for mastic asphalt schemes
	Sikalastic®-2302	Polurethane-based waterproofing multi-layered system suitable for hot rolled asphalt schemes
Waterproofing Mortar	Sikalastic®-6100 FX	1-component, flexible and lightweight cementitious waterproofing mortar with crack bridging properties

GROUTING AND FIXING FOR STRUCTURAL INTEGRITY

Sika provides a wide range of tested and well proven grouts and fixing materials based on all the different technologies available including cement, epoxy, polyurethane and PMMA.

For many decades, Sika has also provided special products for high precision applications such as bearing plates and ancillary elements like traffic signs and other road and rail elements.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Grouting	SikaGrout®	Cementitious grouting products with shrinkage compensation and high strength development
	Sikadur®/SikaFlow®	High performance precision resin grouts based on various chemistries for high durability and excellent mechanical strengths, used to secure elements for proper alignment and transmission of static and dynamic loads induced by vibrations or traffic impacts
Fixing	Sika Fastfix®/SikaEmaco®	Cementitious rapid hardening bedding and fixing mortar for road maintenance works
Anchoring	Sika AnchorFix®	Chemical anchors based on various chemistries for many kinds of anchoring and fixing applications, secures high durability in different substrates of signals and other ancillary elements

DURABLE RAIL FIXING, SEALING, AND EMBEDDING SOLUTIONS FOR LONG-LASTING RAIL TRACK SYSTEMS

Sika offers a complete range of globally trusted solutions, engineered for high-performance, tailor-made direct rail fixation to solid substrates like concrete and steel under the brand Sika® Icosit® KC.

Renowned for durability and precision, the Sika® Icosit® KC systems are used in a wide variety of trackwork applications – including discrete and continuous undersealing, embedded rail systems, green tracks, ballast bonding compounds and dielectric membranes to isolate rail systems.

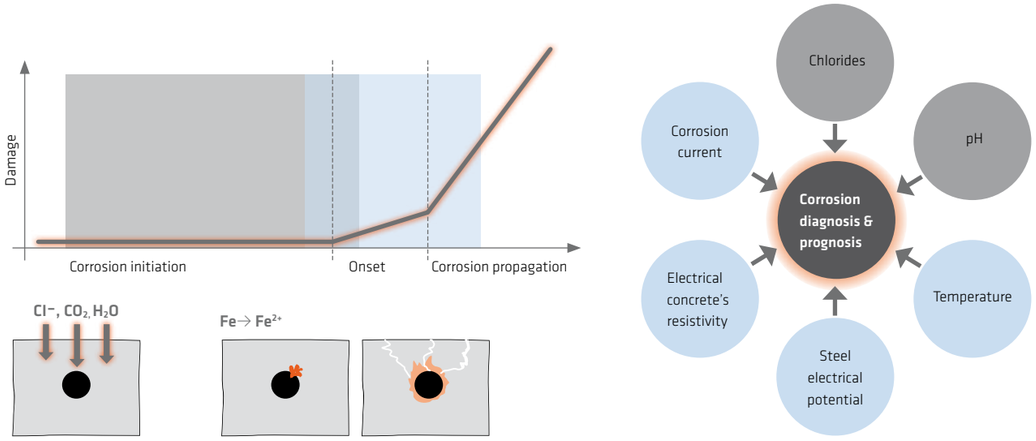
Ideal for railway, light rail, tram, and depot track installations, Sika delivers proven performance wherever long-lasting, reliable rail infrastructure is required.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Continuous undersealing and embedded rail system	Sika® Icosit® KC 340/35 Sika® Icosit® KC 340/45 Sika® Icosit® KC 340/65	2-component flexible polyurethane polymer resin grout used for rail systems with maximum product service loads varying from up to 1 MPa to up to 4 MPa and axle loads varying from less than 120 kN with high deflection to less than 250 kN and standard deflection
Discrete fixation rail system	Sika® Icosit® KC 340/4 Sika® Icosit® KC 340/7	2-component flexible polyurethane polymer resin grout used for discrete fixations in rail systems with maximum product service loads varying from up to 3 MPa to up to 4 MPa and axle loads varying from less than 120 kN with high deflection to less than 250 kN and standard deflection. Suitable for different types of base plates
Joint sealing	Sikaflex®-406 KC	Booster accelerated elastic sealant used for joints between rails, adjacent surfaces and with Sika® Icosit® KC products
Priming	Sikadur-32+	2-component epoxy based pourable compound used primer on concrete (dry and mat damp) and steel (also as a coating it has an electrical surface resistance parameters) substrates, also for setting anchor bolts
	Sika® Icosit® KC 330	1-component primer, for dry concrete and steel substrates
Adhering filler blocks in embedded rail systems	Sika® Icosit® KC 330 FK	2-component fast setting thixotropic, adhesive material for fixing filler blocks with high initial adhesion
Anchoring	Sika AnchorFix®-3030	Chemical anchor based on epoxy resin used to adhere anchor bolts applied with the application dispenser
Ballast Bonding	Sika® Icosit® KC 100 TrackFix Sika® Icosit® KC 120 TrackFix	2-component epoxy or PU based injection resins. Thanks to its high mechanical strengths, it can be used to fix rail ballast/gravel efficiently in railway construction

ADVANCED INSPECTION AND MONITORING TECHNIQUE

The condition of reinforced concrete structures, and the full extent of any damage, is often not visible on the concrete surface. Corrosion damage and structural deterioration can occur internally and be largely propagated, before this is evidenced on the surface, such as with chloride induced pitting corrosion.

It is essential to optimize the number of structures for repair and maintenance, as well as optimizing the cost-effectiveness and extent of the repair works. Optimized life cycle planning with so-called predictive maintenance of reinforced concrete infrastructure, requires a repair and maintenance strategy that allows the anticipation of potential damage. The goal is to catch potential asset malfunction as early as possible to avoid the need for bigger and more disruptive repair works in the future. However, to achieve this, detailed information and reliable data is needed, to allow reliable prediction of structural condition and the level of deterioration.



Reliable corrosion diagnosis and prognosis requires simultaneous monitoring of free chloride concentration, pH, temperature, steel electrical potential, concrete electrical resistivity, corrosion current.

Typical Applications	Sika Solution	Main Characteristics/Advantages
Sensor systems	DuraMon® sensor set	Multi-sensors that can be used in both new and existing structures to monitor the existing concrete condition and performance
Corrosion protection	Sikagard®-8500 CI	1-component dual-phase surface applied corrosion inhibitor for long-term protection against both carbonation and chloride induced corrosion
Protective Coating	Sikagard®-675 W ElastoColor	Waterproof acrylic resin based protective coating for concrete for an excellent carbonation protection
	Sikagard®-5500	Highly elastic, crack bridging, waterproof protective coating for concrete, excellent carbonation barrier

SIKA – YOUR SOLUTION SUPPLIER

SIKA IS A GLOBAL MARKET AND TECHNOLOGY LEADER in specialist construction chemicals for both new bridge construction and maintenance. With manufacturing facilities worldwide and subsidiaries in over 100 countries, Sika combines global expertise with local presence.

Our extensive experience – built over more than 100 years – enables us to support bridge owners, architects, engineers, and contractors with all the technical advice and assistance needed for successful project delivery.

FOR REFURBISHMENT PROJECTS, SIKA PROVIDES:

- Support throughout the entire process, from initial survey and assessment
- Root cause analysis and diagnosis
- Specification writing and detailing
- Method statements and on-site quality control
- Practical application guidance and training

Whether it's reinforced concrete bridges, steel structures, or other civil engineering works, Sika offers a complete range of innovative products and systems designed to meet the toughest project challenges – anywhere in the world.

FOR NEW CONSTRUCTION:

Sika provides tailored support to help design structures that meet demanding performance and service life expectations. Our expertise plays a significant role in minimizing total project cost over the structure's full life cycle.

Thanks to our global network and local specialists, Sika ensures that both clients and end-users receive the technical support they need – whether in the design office or on site.

A GLOBAL COMPANY BUT LOCAL PARTNER

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, industrial flooring as well as roofing and waterproofing systems.

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