INFRASTRUCTURE CONSTRUCTIONS

SUSTAINABILITY & DURABILITY

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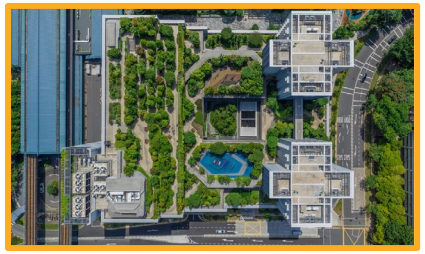
SIKA'S PACKAGE FOR SUSTAINABLE CITIES & INFRASTRUCTURE

KEY SUSTAINABILITY CHALLENGES

01

Climate Change Mitigation & Resilience



Big cities are responsible for about 70% of global CO2 emissions.

02

Circularity & Resource Management

Big cities account for 75% of natural resource consumption and 50% of waste production.

03

Decarbonizing Energy Consumption

Big cities consume up to 80% of global energy.

04

Transportation & Sustainable Mobility

68% of the global population is expected to live in big cities by 2050.

05

Governance & Policy Coordination

Only 11% of cities have a comprehensive climate action plan in place that aligns with the 1.5° goal.

These global challenges affect us all.

ESPECIALLY OUR CITIES !

Yet, what are cities doing? How can Sika help?

NEW BRIDGES
Value Propositions

BRIDGE *NEW CONSTRUCTION* PORTFOLIO

Concrete Elements	Deck Waterproofing	Rail Fixing	Protection
			
In-situ or Precast ▪ Concrete admixtures: sofits, deck, piles, footings ▪ Structural adhesives for segmental bridges ▪ Cable grouting and anchor heads grouting	**Deck waterproofing** ▪ PUA/ PU ▪ Cementitious mortars for non-regulated markets ▪ Bituminous membranes (price driven markets) and Sustainable Epoxy primer	**Rail fixing systems** ▪ PU grouts for ballast- less tracks ▪ Dielectric membrane to insulate the track system ▪ Ballast bonding in specific areas to enhance durability	**Protection** ▪ Protective coatings ▪ Cathodic protection systems ▪ Monitoring systems for prevention ▪ Anti-graffiti protection ▪ Foundation protection

Main driver: Concrete & WP & Refurbishment

BRIDGES REFURBISHMENT

Value Propositions

BRIDGE *RENOVATION* PORTFOLIO

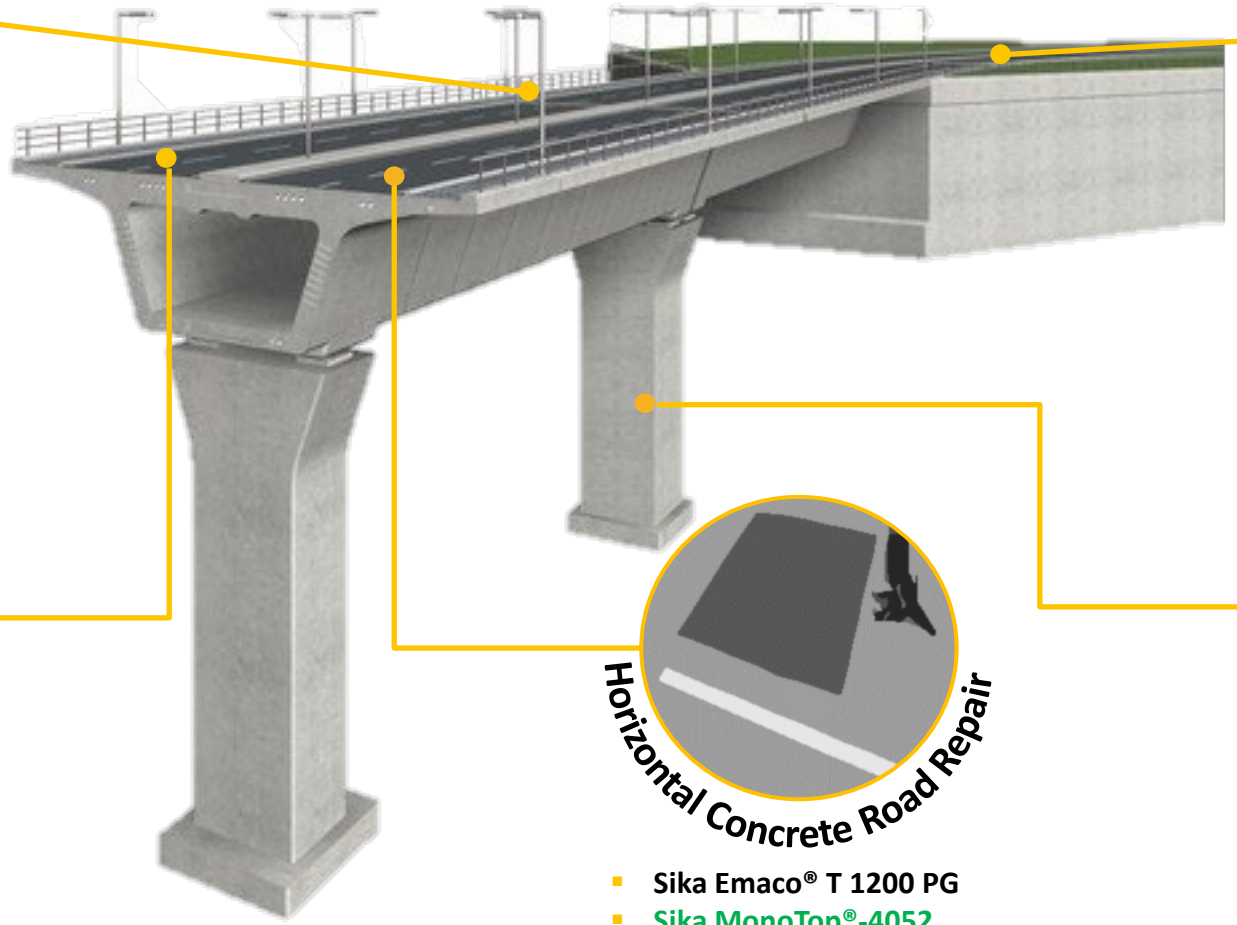
Repair, Strengthen	Deck Waterproofing	ECS	Prevention
			
Repair, strengthen, protect ▪ Concrete repair: sofits, deck, abutments ▪ Bearings: repair + grouting ▪ Strengthening ▪ UPHC for deck repair and waterproofing	**Deck waterproofing** ▪ PUA/ PU ▪ Cementitious mortars for non-regulated markets ▪ Bituminous membranes (price driven markets) ▪ UHPC	**Expansion joints** ▪ Watson Bowman complete range ▪ Sika Wabocrete II ▪ SikaDur Combiflex ▪ Sikaflex 406 KC	**Maintenance/Prevention** ▪ Cathodic protection systems ▪ Monitoring systems for prevention ▪ Anti-bumping membranes ▪ Slab lifting solutions

Main driver: Refurbishment & WP & ECS

SIKA SERVICES AND SUPPORT IN:

DESIGN STAGE
PREPARATION
CONSTRUCTION
DURING USE

STREET WORKS - REPAIR MORTARS APPLICATION OVERVIEW

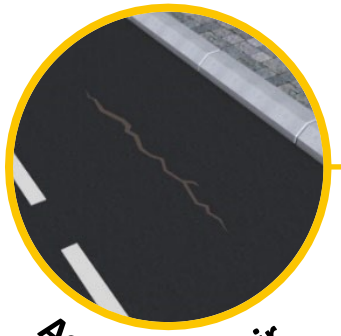


Road Nosing Repair

- SikaEmaco® T 1400 FR
- Sika Wabocrete® II
- SikaFlex® 406 KC+Booster

Manhole Repair

- SikaEmaco® T 1100 TIX
- Sika FastFix® 138, 136 Road



Asphalt Repair

- SikaEmaco® T 1600

Horizontal Concrete Road Repair

- Sika Emaco® T 1200 PG
- Sika MonoTop®-4052

Classic Repair

- Sika MonoTop®-4012
- Sika MonoTop®-4080

SIKA AS FULL RANGE SUPPLIER FOR BRIDGES

Grouting and fixing solutions:
Sika AnchorFix® , Sika FastFix® , SikaEmaco® T , SikaGrout®
Protection: **Sikagard®**

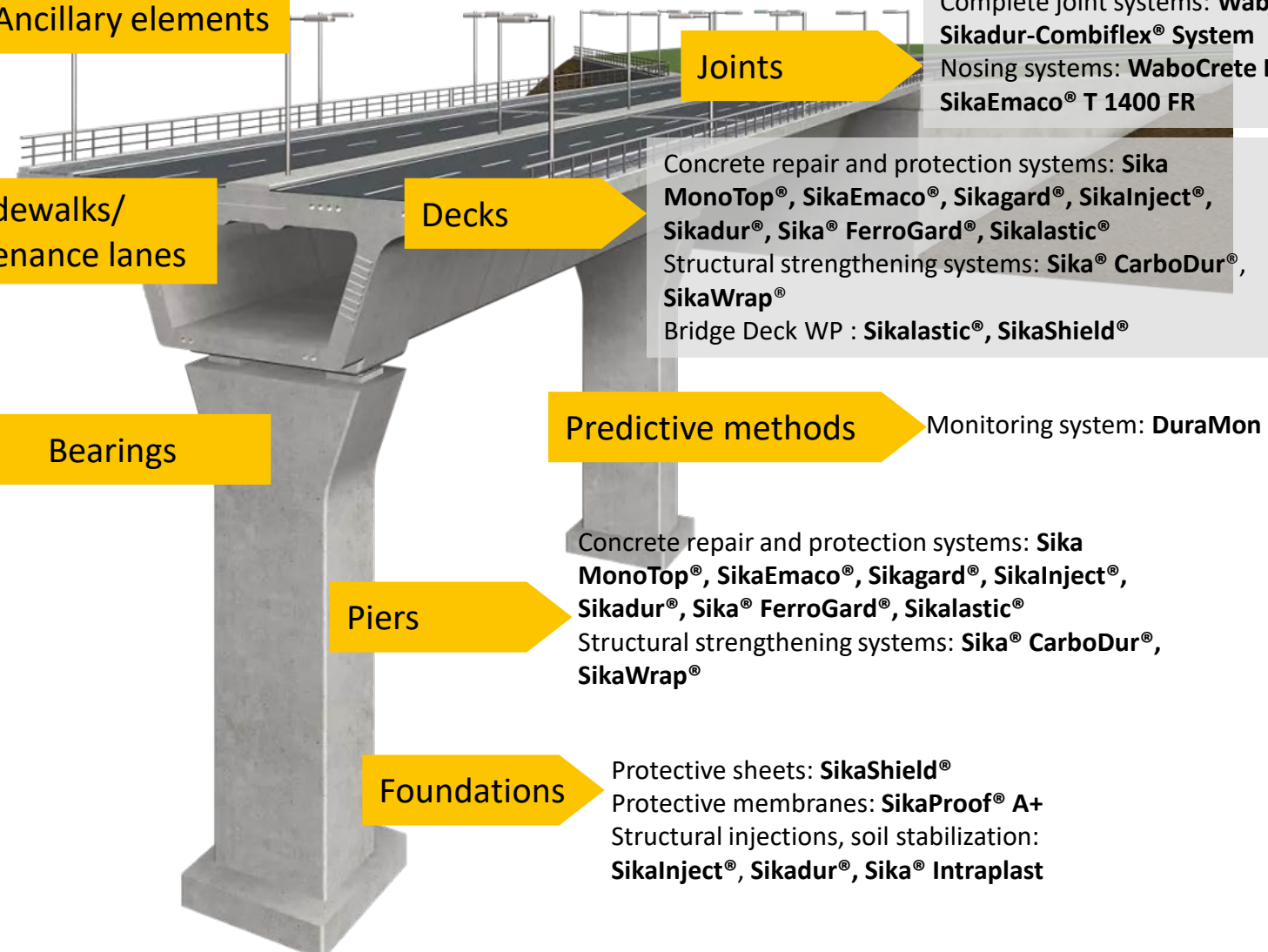
Ancillary elements

Paving range: **Sika FastFix®, Sikafloor®, Sikacrete® 920 UHP**
Structural crack repair:
SikaInject® and Sikadur®
Waterproofing systems:
Sikalastic®, SikaShield®

Sidewalks/ maintenance lanes

Grouting and fixing systems for bearing replacement: **Sikadur®-42+ , Sikacrete® 920 UHPC, SikaGrout®-340+**
Bearings: **Wabo®** bearings

Bearings



Joints

Complete joint systems: **Wabo® joints, Sikaflex® 406 KC Sikadur-Combiflex® System**
Nosing systems: **WaboCrete II®, Sikacrete® 920 UHP, SikaEmaco® T 1400 FR**

Decks

Concrete repair and protection systems: **Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic®**
Structural strengthening systems: **Sika® CarboDur®, SikaWrap®**
Bridge Deck WP : **Sikalastic®, SikaShield®**

Predictive methods

Monitoring system: **DuraMon** sensors

Piers

Concrete repair and protection systems: **Sika MonoTop®, SikaEmaco®, Sikagard®, SikaInject®, Sikadur®, Sika® FerroGard®, Sikalastic®**
Structural strengthening systems: **Sika® CarboDur®, SikaWrap®**

Foundations

Protective sheets: **SikaShield®**
Protective membranes: **SikaProof® A+**
Structural injections, soil stabilization:
SikaInject®, Sikadur®, Sika® Intraplast

BRIDGE DECK WATERPROOFING

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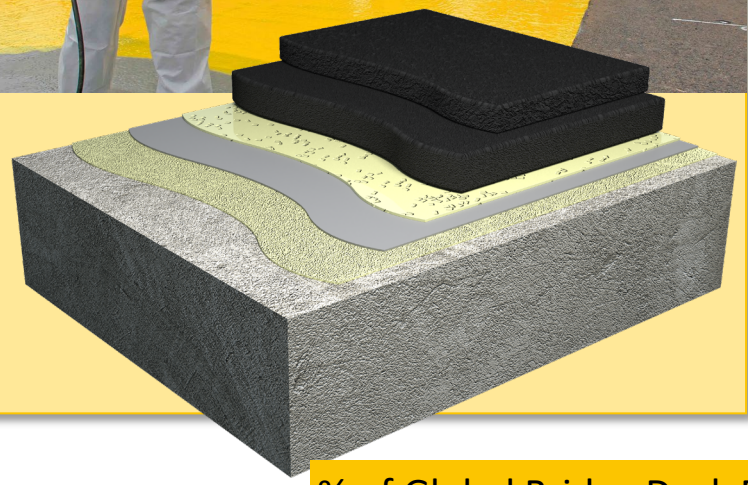
BRIDGE DECK WATERPROOFING

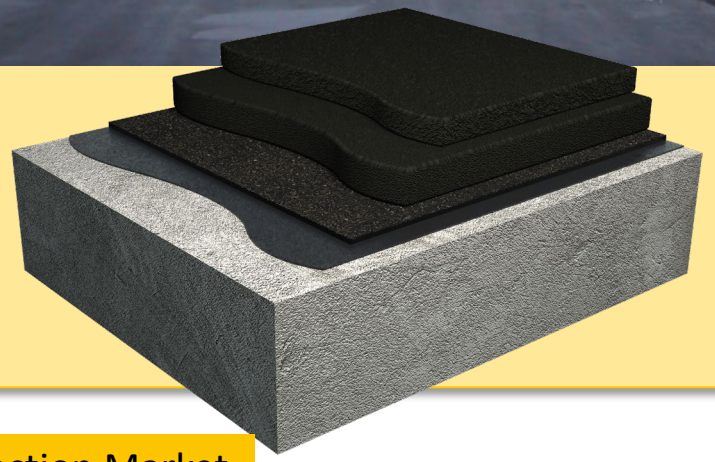
LIQUID APPLIED MEMBRANES

- Sikalastic®-851 system
- Sikalastic® Bridge 5000
- Sikalastic® Traffic 2304
- **Sikalastic® Traffic 2302**



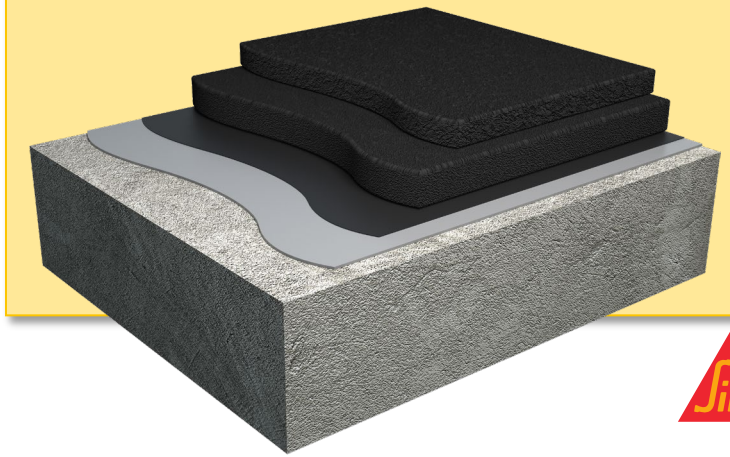
BITUMINOUSE SHEETS

- **SikaShield® range**
- **SikaShield-501 Primer PRO (bio-polymers)**



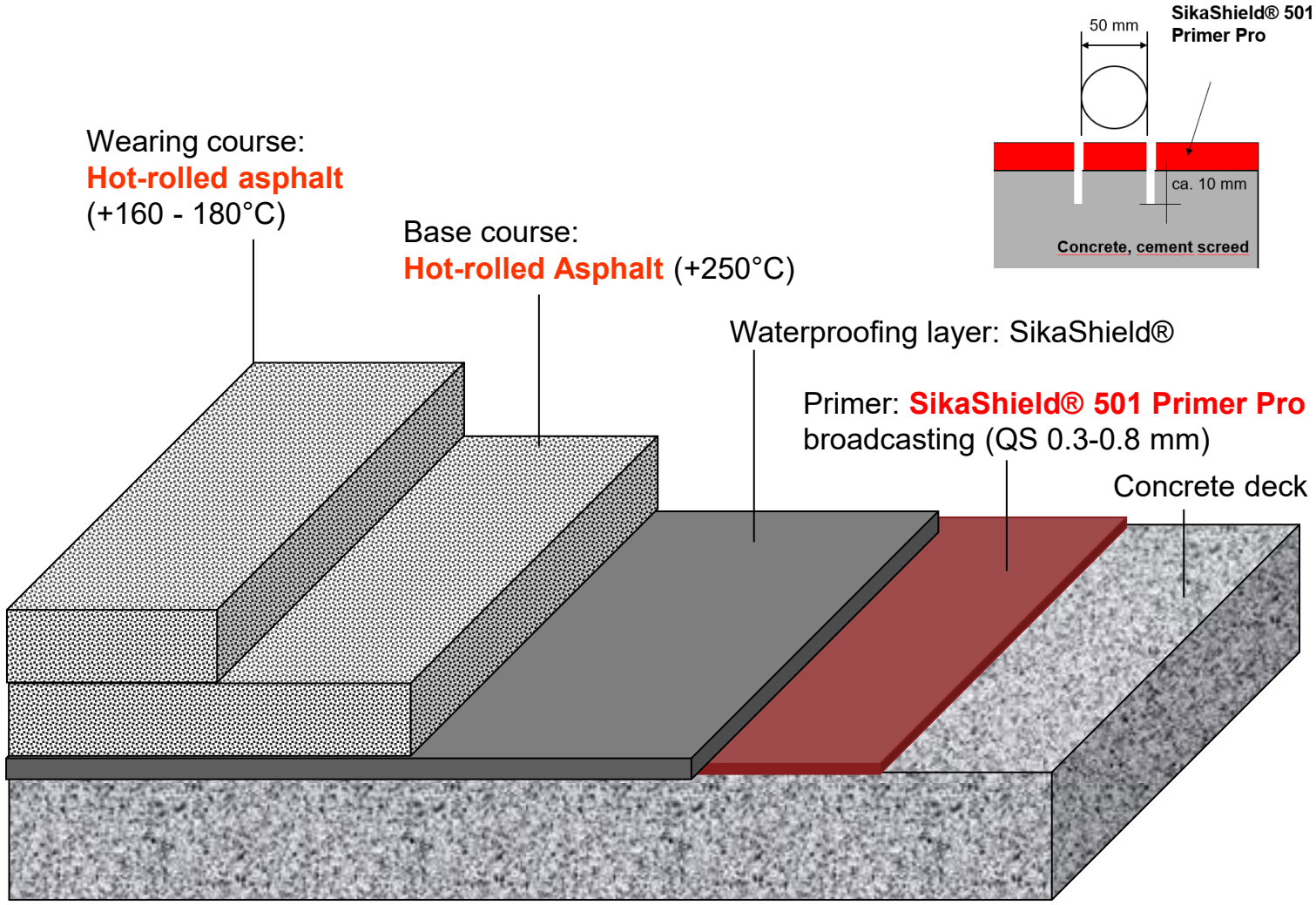
Cementitious Mortar

- **Sikalastic®-6100 FX**
- **Sikacrete 920 UHP**



% of Global Bridge Deck Protection Market

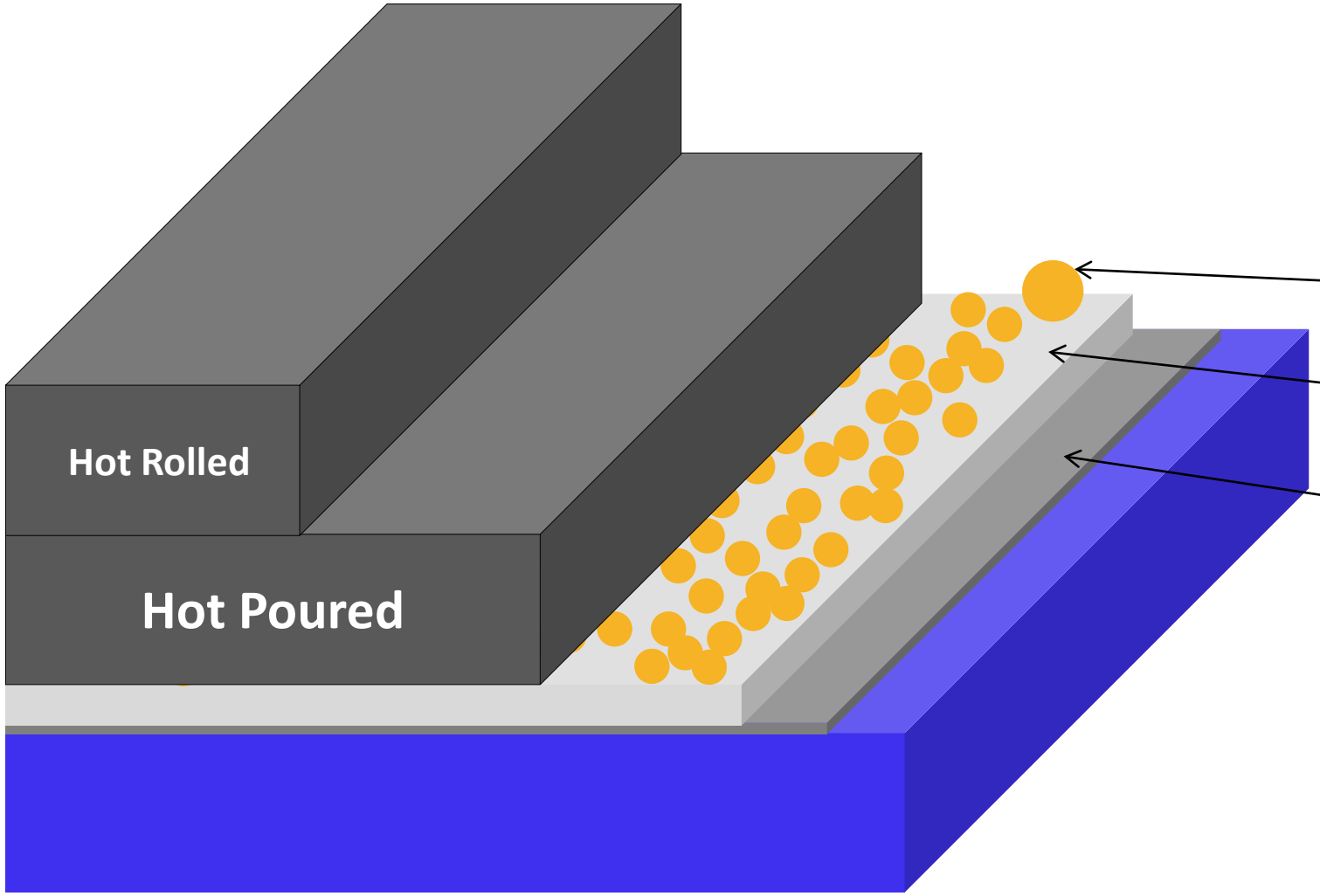
BITUMEN BASED BRIDGE DECK WATERPROOFING – HOT-ROLLED ASPHALT



BITUMEN BASED BRIDGE DECK WATERPROOFING - NO

BITUMEN BASED BRIDGE DECK WATERPROOFING - YES

STEEL BRIDGE SYSTEM BUILD UP
ZTV-ING 6-4



Abrasion layer
- Hot Rolled Asphalt

Protection layer
- Hot Pured Asphalt

Bonding bridge
- Sikalastic®-826 HT

Bridge Waterproofing layer
- Sikalastic®-892 HM Mastic

Primer
- Sikalastic®-891 HM Primer

Steel Substrate
- Clean steel SA 2 ½

STEEL BRIDGE SYSTEM BUILD UP

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CONCRETE REPAIR & PROTECTION

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ONE CONCEPT TO SOLVE ALL CHALLENGES

TOTAL CONCRETE REFURBISHMENT MANAGEMENT

CORROSION MANAGEMENT

All reinforced concrete structures can suffer from damage and deterioration at some stages during their life span. Total Corrosion Management Systems from Sika encompasses an effective range of complete corrosion protection solutions.

- Passive Corrosion Inhibitor
- Active Corrosion Inhibitor
- Dual Corrosion Inhibitor
- Cathodic Protection

REPAIR MANAGEMENT

When reinforced concrete is affected by corrosion, some intense repair work shall be undertaken. Repair Management concept from Sika encompasses a full range of material for concrete restauration.

- Steel Bar Protection
- Structural Repair Mortars
- Resurfacing Mortars
- Grouting & Chemical Anchoring

STRENGTHENING MANAGEMENT

When reinforced has corroded to such an extend that affect the structural capacity of the structure, strengthening shall be carried out to reinstate it.
Strengthening Management concept from Sika provides solution for all types of strengthening requirements.

- Flexural Strengthening
- Confinement
- Shear Strengthening
- Deflection Reduction
- Active Strengthening

PROTECTION MANAGEMENT

Once the appropriate renovation and corrosion management works have been carried out, protecting the concrete against penetration of deleterious elements will help to prolong the design life of the structure.
Protection Management from Sika provides all types of concrete protection solution from invisible protection to crack bridging system.

- Hydrophobic Impregnation
- Protective Coating
  - Anticarbonation
  - Antigraffiti
  - Chemicals

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Structural strengthening Bozovici Bridge

The first bridge strenght with carbonfibers in Romania

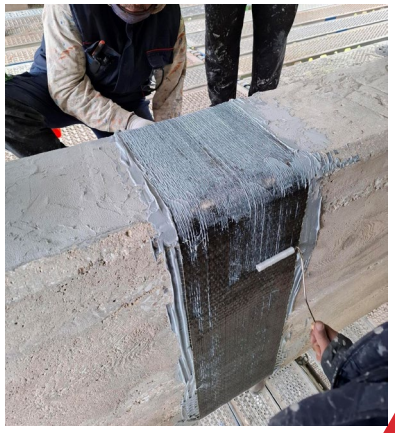
In the initaial project they need to fix ower 10.000 ancors and apply 10 cm of new concrete.
We recomand the Sika System that was in the end cheaper and much much quicker.

Used Sika Materials:

-Sika Viscocrete 2320, Sika MonoTop range , SikaCarbodur S 1012, SikaWrap 230 C, Sikagard 550, Sikaflex Pro 3.

ĐURĐEVIĆA TARA BRIDGE – MAJOR REHABILITATION PROJECT

- **Đurđevića Tara Bridge, built in 1940, 5 arches, 365m long, roadway stands 172m above Tara River**
- **Contractor:** Antikor, M Solutions
- **Owner:** Governement of Montenegro
- We joined the project in **2021**, collaborating closely with the designer from the early stages. We implemented a **Total Corrosion Management** approach, successfully integrating our materials into the project to cover rehabilitation, structural strengthening, and protection.
- We successfully deployed the strongest and most advanced solutions in our portfolio, fully addressing the needs of this landmark bridge.
- **The overall potential of materials:**
  - CarboDur Plates- **10,5 km**
  - SikaWrap-300 C- **15,5 km**
  - Sikadur-30- **7t**
  - Sikadur-330- **8t**
  - SikaWrap FX-50 C- **4,5 km**
  - Repair Mortars- **50t**
  - Protective coatings (**Sikagard-706 Thixo + Sikagard-5500**)- **30.000 m2**



ĐURĐEVIĆA TARA BRIDGE – MAJOR REHABILITATION PROJECT

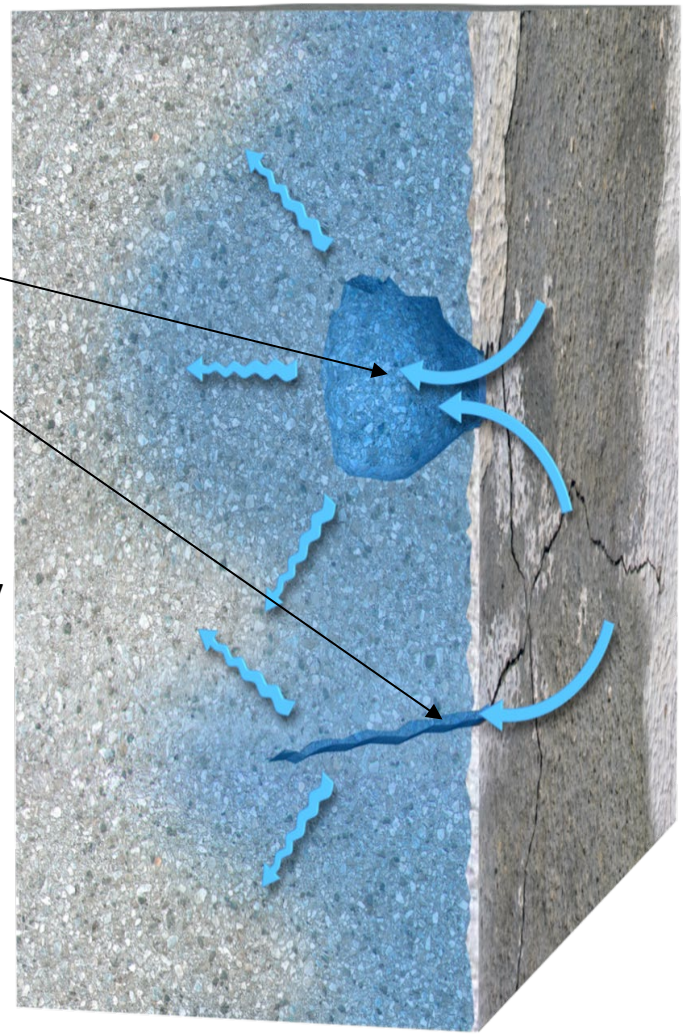
HYDROPHOBIC PRIMER & COATING SYSTEM - PRINCIPLE

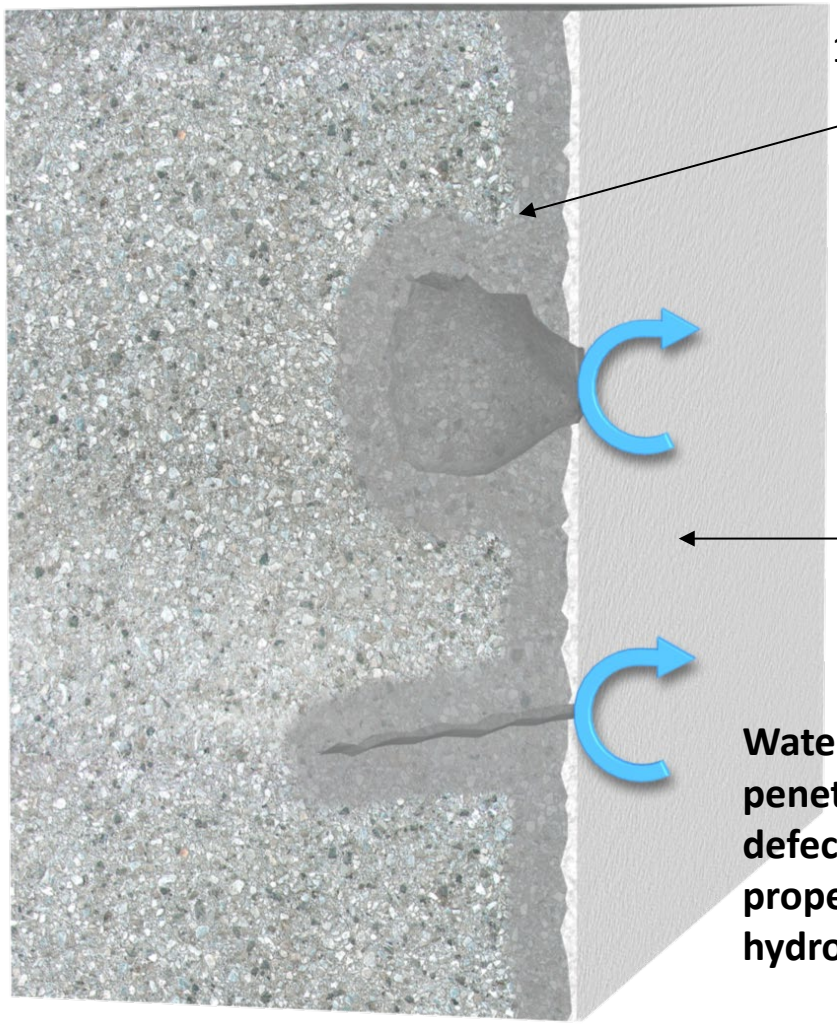
Localised defect in coating

Concrete below the coating will be moistened.

Coating will be pulled-off by frost

Deleterious elements may penetrate the concrete through the defects





1 -2 x Sikagard-705 L

1-2 x Sikagard 5500

Water won't be able to penetrate through the defects due to the repelling properties of the hydrophobic primer

FROM TRAMS TO TRACKS AND TUBES TO TUNNELS

SIKA HAS GOT YOUR INFRASTRUCTURE COVERED

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RAIL INFRASTRUCTURES : VALUE ENGINEERING FOR EFFICIENT LIFE CYCLE COST, AND LONG DURABILITY

Full Technical Compliance

- Compliance with **Standards and Regulation**, to insure both **security** and **functionalities**
- Serving the Market for more than 50 years

Optimizing Life Cycle Cost

- **Durability of the system**: Track Record of projects with over 25 years projects with no repair
- Excellent **Life Cycle Cost** (LCC):

operational comfort and downtime reduction

- **Fast return to service** when needed;
- **Easy Application** and **reduced downtime**
- Reduction of **secondary noise** & **Vibration mitigation**
- **Increasing comfort** of passengers

Sustainability Engagement

- **Sustainable Systems**
- **EPD** Declarations
- **LCA;**
- and **Products Carbon Footprint**
- CAD drawings & method statements
- Specifications Clauses

Sika Rail infrastructures

Rail Bridges

Rail Tunnels

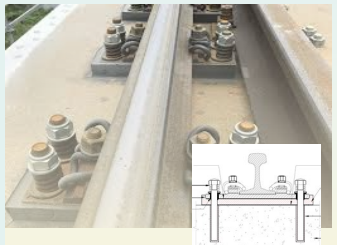
Trams

Metros

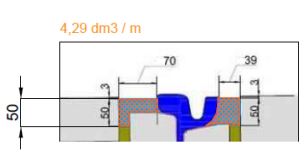
Trains Stations

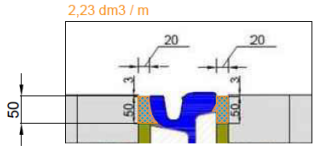
SOME HIGHLIGHT OF THE SIKA OFFERING
OFFERING FOR A BETTER DURABILITY

1 Rail Fixing



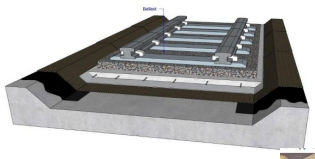
For **Lines** & **Depots** : Fixation of the Rail on Ballast-less Track

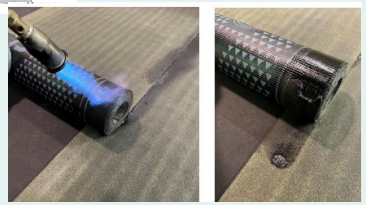




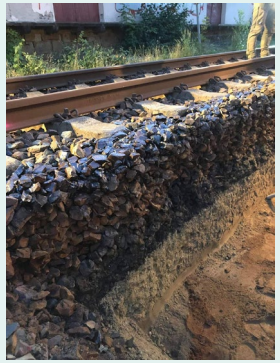
Sealants for Rail, for both new construction and Repair Projects

2 Dielectric membrane





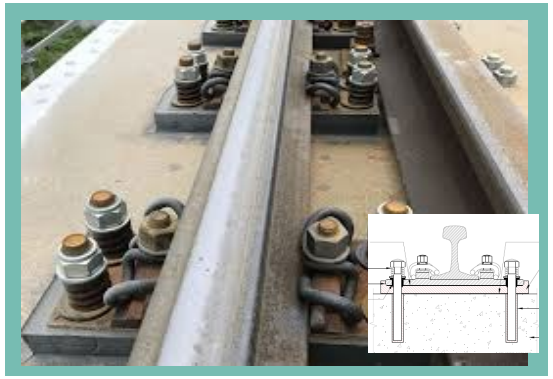
3 Ballast Bonding



WHAT AND WHY RAIL FIXING

Types of Rail fixing:

1 **Discrete Fixation : "**Point Fixing"



2 **Embedded Rail System: "**Continuous Fixing"

Main Requirements:

1 Dynamic Loads requirements

Important Requirement to resist to dynamic loads " Fatigue Test "

+

2 Compensation of longitudinal and lateral displacements

An important requirement to insure the durability of the system

Main Requirements:

1

Maximum load: 1,5 N/mm²
Minimum load: **0,1** N/mm²

Loading frequency: 5 Hz

Number of cycles: 3 million

+

2

Elasticity

Elongation to break > 120%

WHERE RAIL FIXING IS POTENTIALLY USED

Tramways:

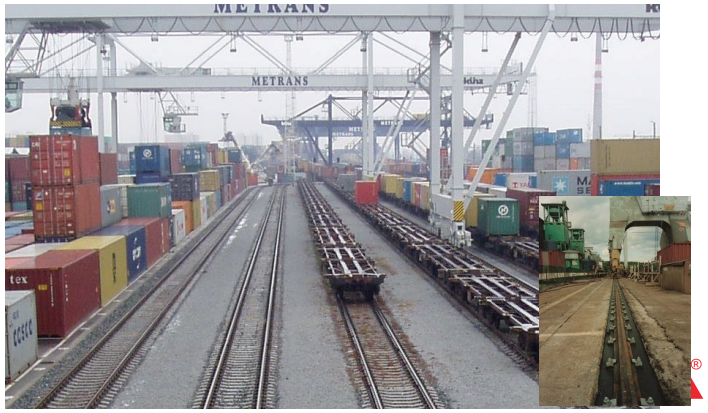
Metros:

Bridges:

Depots:

Level Crossing:

Intermodal Transport:




Sika
Doctor
Concrete


Doctor
Concrete
If you need a Doctor for Concrete
Ask a Sika Specialist
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