Project Report/April 2021

Maintenance and Surface Protection for the Motorway Junktion “Barkauer Kreuz“ Kiel, DE

After 50 years of intensive use and increasing traffic volumes, the city of Kiel, Germany, has begun to have the Barkauer Kreuz traffic junction renovated in three construction phases. The first construction phase was successfully completed in August 2020. The approximately 1,600 square metres of the so-called "high-flyer", a high ramp from the middle of the B 404, leads from the south onto the Theodor-Heuss-Ring road.

During this first construction phase, the elevated road, which was completed in 1968, underwent concrete repairs on the underside of the bridge and on all pillars in the western area. The repairs were preceded by a professional structural inspection and building condition assessment.

StoConcrete Repair Prime TS 100

StoConcrete Repair Prime TS 100 was used for the pillars, a tested concrete repair system from the wide-ranging StoCretec product line. It is particularly suitable for the stability-relevant repair of concrete structures with static involvement and for protecting the reinforcement from corrosion. **StoConcrete Repair Prime TS 100** can be applied to bridge structures under dynamic loads - i.e. while traffic is moving. This saves road users from unpleasant long road closures. In addition, the StoCrete TS 100 dry-mix sprayed mortar can be used to create a layer thickness of up to 50 mm in one application cycle. This means that the necessary concrete cover and topography of the pillars can be created quickly.

StoConcrete Repair Prime TS 100 is also characterised by its good thermal compatibility. It easily withstands hot summers and extreme stresses caused by “cloudbursts” in mid-summer.

The dry-mix sprayed mortar StoCrete TS 100 corresponds to class R4 in accordance with EN 1504 or M3 in accordance with German Rili-SIB. It has a high carbonation resistance and a high frost-de-icing salt resistance. This is of great importance for bridges in order to ensure their long-term traffic safety. The low capillary water absorption of the mortar offers a high resistance

to the penetration of water and harmful substances diluted in water into the concrete structure. In addition, the system counteracts possible risks from new defects caused by spalling because it can be adapted to suit the properties of the existing concrete: This is facilitated by the static modulus of elasticity (E = 23 GPa according to EN 13412).

StoConcrete Protect Elastic FB – crack-bridging system with increased impermeability for the protection of concrete structures

As additional protection for the "high-flyer", the pillars of this construction section were coated with the crack-bridging surface protection system **StoConcrete Protect Elastic FB**. The mineral system serves here as an OS 5b surface protection system. It is statically and dynamically crack-bridging, weather- and age-resistant and resistant to salt spray.

Other excellent properties of the proven **StoConcrete Protect Elastic FB System** are:

- Low water absorption
- High resistance against alkali
- High UV resistance
- High frost-de-icing salt resistance
- Very good water vapour permeability: class I in accordance with EN ISO 7783
- Water tightness of 3 bar
- High CO^2 density: sd-value > 50 m in accordance with DIN EN 1062-2.

The system build-up is tested and has all relevant approvals.

StoConcrete Protect V Surface Protection System

The repair of the undersides of the "high-flyer" began after preparing the substrate with the consolidating primer StoCryl GW 200. The product creates a very good adhesive bond. An intermediate coat of StoCryl ZB was applied to levelling out slight unevenness and fill cavities. This provides a very good adhesive bond to subsequent top coating layers and very good filling of blowholes. The coating keeps the substrate open to water vapour diffusion. It can be applied by painting, rolling and airless spraying.

The surface protection system **StoConcrete Protect V** is finalised by StoCryl V 100. The rigid coating prevents water and harmful substances diluted in water from penetrating the building

structure. It regulates the moisture balance, is permeable to water vapour and impermeable to carbon dioxide. The StoConcrete Protect V surface protection system meets the requirements of EN 1504-2.

Who & What

Project:	Barkauer Kreuz, Kiel, DE
Investor:	Stadt Kiel, Tiefbauamt, Kiel, DE
Planner:	Ingenieurbüro Mohn GmbH, Kiel, DE
Applicator:	ABV Bau Ullrich GmbH, Neumünster, DE
Realisation:	8/2020

Systems/Products:

Concrete repair

StoConcrete Repair Prime TS 100

Corrosion protection	StoCrete TK
Repair mortar	StoCrete TS 100

Surface protection

StoConcrete Protect Elastic FB

Scratch coat and coating	StoCrete FB
StoConcrete Protect V	
Primer	StoCryl GW 200
Intermediate coat	StoCryl ZB
Coating	StoCryl V 100

Photos: StoCretec GmbH –

Unfortunately, it was not possible to take photos quickly enough as the first graffiti had already appeared on the freshly coated surfaces the morning after the application …

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