



SIKA AT WORK

FORTH ROAD BRIDGE, FIRTH

REFURBISHMENT: Sika®-Armorex® Armorcrete and Sika® Armorex L2 High Flow

BUILDING TRUST



FORTH ROAD BRIDGE, FIRTH, SCOTLAND

SIKA CONCRETE REPAIR SYSTEM SPECIFIED FOR FORTH ROAD BRIDGE. For a structure which was built using 39,000 tonnes of steel, 125,000 cubic metres of concrete and has a main span of 1006 metres, the Forth Road Bridge is a feat of engineering. But with 65,000 vehicles using it every day and traffic loading significantly higher than expected by engineers who designed the structure in the 1950's, it was time to replace the bridge bearings and repair the bridge piers on the approach viaducts. Appointed by main contractor Balfour Beatty to bring the structure up to 21st century specifications, specialist contractor Freyssinet Makers turned to Sika for a long term, reliable and industry-proven concrete repair solution.



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Spanning the Firth of Forth in Scotland, the £13.6m project for the Forth Estuary Transport Authority involved the replacement and refurbishment of the steel bearings on the north and south approach viaducts of the bridge, together with associated concrete repairs to the approach piers and strengthening to the steel box superstructure.

"The steel bearings sit on top of the approach viaducts and allow the deck to move and accommodate changes in temperature and traffic load," commented Graham Sanford, Business Manager of Freyssinet Makers. "During inspections and monitoring, the existing bearings were exhibiting little or no movement but were showing varying amounts of corrosion. Consequently the surrounding concrete and grout was beginning to show considerable wear and tear."

Prior to the replacement of the bearings, action was required to repair the concrete pier tops with Sika's unrivalled range of high performance repair mortars once again proving ideal to re-strengthen the approach viaduct piers and protect this iconic bridge for many years to come.

Approached early in the design process, Sika worked closely with the consulting engineers Atkins and main contractor Balfour Beatty to

advise material selection and properties required for a performance-based specification.

Significant structures in their own right, the two approach viaducts at 252 metres and 438 metres on the north and south sides respectively, required around 100 tonnes of concrete repair products with Sika's Armocrete, a cementitious free flowing micro-concrete repair system, used for all pier repairs and Sika®-Amorex® L2 High Flow, a rapid strength grout used under the large bridge bearing plates.

"Extensive flow trials were carried out on a specific test rig set up by Balfour Beatty and Atkins to prove the flowability and strength of these products," commented Ronnie Turner of Sika. "Once testing was done Atkins signed off the specification and both were poured under gravity and allowed to cure while the bridge was still live and being used."

The fact that the concrete piers were adjacent to the communities either side also meant that the works had to be completed with minimal disruption and containment to keep dust down. Hydro-demolition was used to remove deteriorated concrete in the pier head, leaving a perfect bonding surface for the concrete repair material.

Sika's entire range of concrete repair products is certified to BS EN 1504, the European standard for concrete repair. This accreditation applies not only to the production quality of the products themselves but also to the guidance issued with them. The accreditation ensures users of the high quality nature of Sika's concrete repair systems.

Longstanding concrete renovation is essential for a variety of public and private structures. For its effectiveness, Sika's concrete repair system has ensured simply applied, economical and longstanding preservation of the iconic suspension bridge. It stands as an example of why Sika's innovative products are a favourite of specifiers and operatives the world over.

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