

Case Study

Market Application Focus

Bridges
Bridge Deck Repair
Roadway Patching

Project: Zeb Vance Norman Bridge
Owner: North Carolina DOT
Specifier: North Carolina DOT
Contractor: Carolina Restoration & Waterproofing
Year: 2002

The Problem



The Zeb Vance Norman Bridge is approximately 1.5 miles long, has 2 lanes and spans the Roanoke Middle and Cashie Rivers. It serves as a major thoroughfare connecting routes US 64 and US 17 in addition to providing access to key industrial areas. The bridge was constructed in the mid 1970's on piles utilizing prestressed concrete girders and a cast-in place, 8" reinforced concrete deck.



Spalling of concrete on the bridge deck led to an investigative analysis. The analysis indicated that the quality of the concrete cover was poor and in many areas insufficient in depth. The bridge is also exposed to an aggressive environment. All of these factors contributed to accelerating corrosion of the reinforcing steel which led to spalling of concrete in various areas throughout the deck.

The Sika Solution

The goal of the repair was to remove the unsound concrete and replace it with high quality material with a fast turnaround time in order to minimize lane closures on this busy bridge. In order to achieve this goal, the Owner specified that the material must achieve 2,500 psi compressive strength in eight hours, have low shrinkage, low permeability and excellent adhesion even under dynamic loading conditions.



SikaSet Roadway Patch 2000 (SikaQuick 2500) was placed into various repair areas totaling approximately 1,800 square feet. The material was extended with 3/8" pea gravel to form a fast-setting concrete mix because the repairs ranged from 2" to 3" deep. SikaSet Roadway Patch 2000 (SikaQuick 2500) is a very-rapid hardening repair mortar that is dimensionally stable (low shrinkage), results in excellent bond to properly prepared substrates and has a low permeability. SikaSet Roadway Patch 2000 (SikaQuick 2500) provides excellent quality cover and protection to the reinforcing steel. All the repairs were completed at night in order to maintain traffic flow with at least one lane open at all times with traffic back on the repairs within 8 hours.



Sika's System approach to Concrete Repair and Protection

Anti-Corrosion Primer and Bonding Bridge

Sika Armatec® 110 EpoCem® - protects rebar in areas of inadequate cover.

High-Performance Repair Mortars

SikaTop® PLUS - two-component, polymer modified mortar containing Sika FerroGard 901 corrosion-inhibitor. Sikacem mortars are machine-applied by dry-spray equipment for large scale repairs.

Problem Joints/Cracks Sealing System

Sikadur® Combiflex® - a unique strip and seal system used to seal problem joints and cracks, even those undergoing extreme movement.

Hard Wearing Epoxy Overlay

Sikadur® 22 Lo-Mod epoxy resin will provide decorative hard wearing, slip resistant, overlay systems for balconies not requiring a crack bridge membrane.



Joint Sealing

Sikaflex®, High Performance Sealants - are premium-grade polyurethane joint sealants that are fully compatible with Sika's concrete repair systems.

Anti-Carbonation Coatings

Sikagard® 550W and 670W - protect concrete facades from the damaging effects of carbon dioxide (carbonation), water and pollutants. Either crack-bridging (550W) or rigid (670W), both are high-performance protection coatings, available in a variety of decorative colors.

Epoxy Injection and Bonding

Sikadur® - epoxy resins help restore structural integrity by injection into cracks and voids. The most comprehensive range of epoxy products for structural bonding and grouting.

Structural Strengthening Systems CFRP

Sika CarboDur® - a proven system of external strengthening using epoxy-bonded Carbon Fiber Reinforced Plastic (CFRP) laminate strips. Stronger than steel, yet lightweight and non-corrosive, this system can solve unique strengthening problems in a variety of concrete structures.

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