

<b>Market</b>	<b>Building</b>
<b>Application</b>	<b>Concrete Repair and Protection</b>
<b>Focus</b>	<b>Chloride-Induced Corrosion</b>

**Project:** Floyd Hall Science Building  
**Owner:** University of North Alabama  
**Specifier:** Kevin Jangaard Architects  
**Contractor:** Western Waterproofing Co.  
**Year:** 2002

### The Problem



Floyd Hall Science Building is located on the Campus of North Alabama in Florence, Alabama. It is a four story concrete building with a brick and stone façade built in 1964. The building has three floors of concrete balconies each approximately 10' wide and 335' long, for a total balcony area of over 10,000 sf. The 4-inch concrete slabs were originally poured with concrete and the reinforcement placed too close to the surface resulting in insufficient concrete cover. Thirty-eight years of wear, weather and occasional de-icing salts caused

corrosion in the reinforcement steel which led to spalling of the concrete. Active corrosion was detected in the remaining sound concrete and according to core analysis the highest chloride content was 0.097% by weight of concrete. Some carbonation was detected but was determined not to be a significant factor.



### The Sika Solution

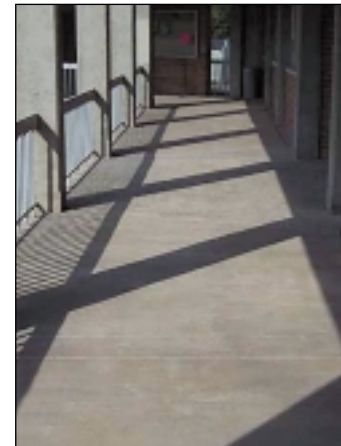
The goal of the Owner and Engineer was to correct a drainage problem, add quality cover to the reinforcing steel and to reduce active corrosion in chloride-contaminated concrete in order to extend the service life of the balconies.

*The repair strategy employed to achieve the goal included:*

1. Remove delaminated concrete and apply Sika Armatec 110 EpoCem to all exposed reinforcing steel. Sika Armatec 110 EpoCem is a combination bonding agent and anti-corrosion coating. Because of its effectiveness to protect reinforcing steel, Sika Armatec 110 EpoCem is often used in locations where there is insufficient cover as a means of providing additional effective concrete cover.

2. Application of Sika FerroGard 903 to the top surface of all the balconies. Sika FerroGard 903 is an amino-alcohol, multi-functional, surface applied corrosion inhibitor. It is designed to penetrate hardened concrete, restore the passive film of the reinforcing steel and to provide protection and reduce corrosion to the reinforcing steel.

3. SikaSet Roadway Patch 2000 (SikaQuick 2500) was applied to over 10,000 sq. ft. of overlays at varying depths up to 1 1/2" over the entire balcony. 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 to the reinforcing steel and was applied in such a way to pitch water away from the building to eliminate any ponding or drainage problems previously existing.



Case Study

**Sika**®

## 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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