



CASE STUDY

## MARKET APPLICATION FOCUS

Office Buildings

Concrete Repair & Protection

Penetrating Corrosion Inhibitors

**Project:** VSSM Building  
**Owner:** Swiss Carpenter Association  
**Specifier:** Walt & Galmarini Engineering  
**Year:** 1996

### THE PROBLEM

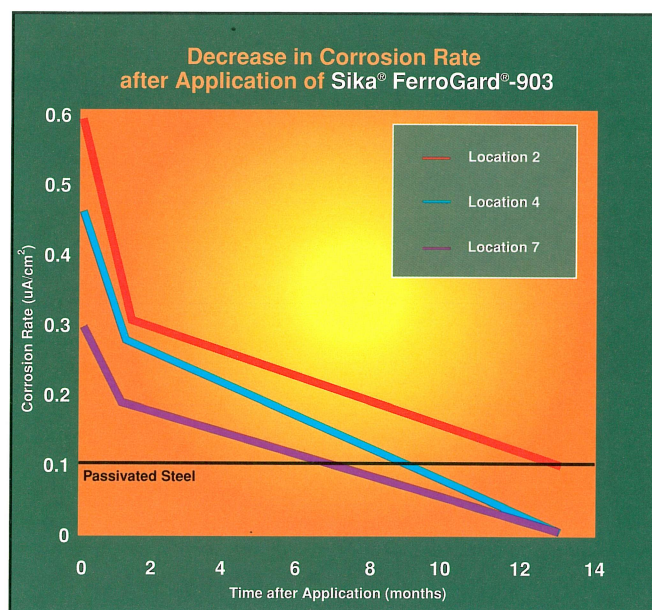


The 3-story office building in downtown Zurich (CH) showed cracks and minor spalls on the concrete elements of the facade. The coating was weathering off and could no longer protect the concrete from deterioration. An investigation showed that 90% of the reinforcing bars were in carbonated concrete and were exposed to the risk of corrosion. Corrosion rate measures indicated that out of the nine locations three already displayed medium to high corrosion rates.

### THE SIKA SOLUTION

To protect the reinforcing steel from further corrosion and to reduce the rate of corrosion on the already corroding rebars, the existing cracks and spalls were repaired and Sika FerroGard 903, a surface applied corrosion inhibitor was used. Sika FerroGard 903 penetrates toward the steel and builds a protective layer on the steel, which delays the onset of corrosion. FerroGard 903 also reduces the already existing corrosion by at least 66%, which considerably extends the lifetime of the concrete structure and the repairs. It was the specifier's desire to measure the actual corrosion rates

before and after application of the FerroGard 903 to determine its effectiveness. A testing lab was hired to measure the corrosion rate in different areas of the building over time. The graph shows the measurements in an area that was treated only with the corrosion inhibitor, and indicates that the corrosion rate decreased (tested in according with ASTM G 3) after the application of FerroGard 903 to a level where the steel can be considered passivated.





## ***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.

### **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.

### **Crack Bridging Deck Membrane**

***Sikafloor® 450/455*** is a single-component polyurethane system used to provide a durable, abrasion resistant, waterproofing layer for balconies, parking and plaza decks.



### **Hard Wearing Epoxy Overlay**

***Sikadur® 22 Lo-Mod*** epoxy resin will provide 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, chlorides 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 Composite Systems**

***Sika CarboDur®*** - a proven system of external strengthening using epoxy-bonded Carbon Fiber Reinforced Polymer (CFRP) laminate strips and/or carbon or glass fabrics. 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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