

Case Study

Market	Building
Application	Concrete Repair
Focus	Chloride-Induced Corrosion

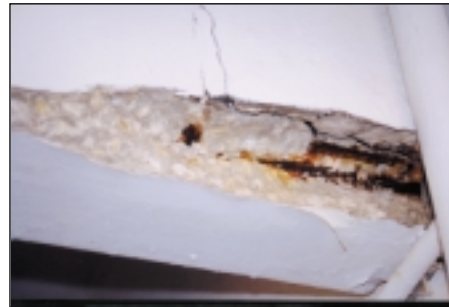
Project: Brigadoon Condominium
Owner: Brigadoon Condo Association
Specifier: Howard Miller & Associates
Contractor: Southern Construction Services, Inc.
Year: 2002

The Problem

Brigadoon Condominiums is a 12 story building located on the beach in Juno Beach, Florida. The building was constructed in the early 1980's with cast-in-place, conventionally reinforced concrete structural elements, facade and balconies.



Concrete spalling primarily at the balcony edges and to a lesser extent at the walkways led to an investigation involving visual assessment and sounding to define areas of delamination. The analysis indicated that the quality of the concrete cover was poor and in many areas insufficient in depth. The building is also situated in an aggressive environment. The climate is hot and humid.



The buildings close proximity to the Atlantic Ocean makes it susceptible to intrusion of chloride ions. All of these factors contributed to accelerating corrosion of the reinforcing steel which led to spalling of the concrete at various locations along the balcony edges and walkways.

The Sika Solution

The goal of the Owner was to remove the unsound concrete and replace it with high quality materials in order to restore integrity to the structure and provide protection to the reinforcing steel. Additionally, it was required that the repair material be compatible with the existing concrete while improving its durability. The repair strategy 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. Sikacrete 211 was used to repair the delaminated concrete at the balcony edges and walkways requiring 325 cubic feet of material. The contractor mixed all of the material in 5 gallon pails and poured it into the formed areas from a swing stage scaffold hung from the side of the building. The repairs varied from 1" partial depth replacement to 8" full depth replacement. Sikacrete 211 is a one-component, cementitious pumpable and pourable concrete mix. Sikacrete 211 is pre-extended during production which eliminates the need to extend the product on-site. Excellent bond, low shrinkage and a long slump life resulting in excellent quality concrete cover, make this material particularly well suited for this application.



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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