



CASE STUDY

MARKET APPLICATION FOCUS

Water Treatment

Concrete Repair

Surface Erosion

Project: Andover Water Treatment Plant
Andover, MA.
Owner: Town of Andover, MA.
Specifier: Town of Andover, MA.
Year: 1997

THE PROBLEM

The 24 MGD Andover Water Treatment Plant included four sedimentation tanks that were put on-line in 1974. The tanks which measured approximately 120 ft. long by 18 ft. wide by 16 ft. deep, were suffering from severe concrete erosion below the water line caused by an aggressive water chemistry. Concrete that is exposed to water with a pH of 6 or less, produces new calcium compounds which are very soluble and can easily erode. The presence of low pH water at Andover had weakened, and in many cases dissolved the top 1/4 to 1/2 inch of cement matrix. Ignoring the problem was unacceptable since further erosion of the cement matrix would have necessitated large scale repairs or total replacement within a few years.



Above the water line in the splash zone, the concrete had spalled from the effects of freeze/thaw cycling. Additionally, the joints in the concrete tank were leaking and were spalled at the edges.

THE SIKA SOLUTION

The first step in the rehabilitation process was to repair the joints. In order to rebuild the joints with a repair mortar, the water leakage had to be stopped first. To accomplish this task, the contractor injected SikaFix HH polyurethane foam grout into the leaking joints. The water-reactive foam expands when contacted by water, thereby creating a compression seal within the confines of the joint. Once the leakage was stopped, the spalled joint edges were then repaired using SikaTop 122 Plus polymer modified repair mortar.

The next step involved patching the spalls above the water line with a high density/low permeability repair mortar. After saw-cutting the edges of the spalled areas, the contractor selected Sika MonoTop 615 to patch the spalls. MonoTop 615 was selected because it is an easy to apply, extremely dense and freeze/thaw resistant mortar.



The key objective of the project was to ensure long-term protection to the tank walls. To restore and protect the tank walls from the erosive effects and chemical attack of the water within the tank, SikaTop Seal 107 was sprayed on all wall surfaces. SikaTop Seal 107 is a polymer-modified, protective and waterproofing cementitious coating which significantly reduces the ability of water to penetrate into the concrete. By decreasing the ability of water to penetrate the concrete, the potential for freeze/thaw damage and surface erosion caused by chemical attack was minimized.



For Water Treatment Facilities... Sika's System approach to Concrete Repair and Protection

Anti-Corrosion Primer and Bonding Bridge

Sika Armatec 110 Epo-Cem - protects the steel from corrosion in areas of inadequate cover. Improves bond of repair mortar to both the substrate and steel.

High-Performance Repair Mortars

SikaTop PLUS mortars - two-component, polymer-modified materials containing Sika FerroGard 901 corrosion-inhibiting admixture.

Sikacem mortars are machine-applied by dry-process shotcrete techniques for large scale repairs requiring a high level of concrete protection.

Leveling mortars for Coating Damp Concrete

Sikagard 75 Epocem - can be used as temporary moisture barrier to allow application of epoxy coatings (even when the concrete cannot be made dry).

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. Failed joint sealants need not be removed prior to installing Combiflex (a great labor savings).

Joint Sealing

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

Surface Sealing/Waterproofing Mortar

SikaTop Seal 107 - a polymer-modified waterproofing and surface sealing mortar for tanks and reservoirs. Used on the inside of the tank walls it prevents water-loss (seepage) and prevents surface erosion. Used on exterior walls it protects water quality by preventing infiltration.

Protective Epoxy Coating

Sikagard 62 - a 100% solid, high-build protective coating used successfully on water projects for decades. It offers long-term protection to the concrete and easy maintenance.

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.

Chemical Grouts for stopping water leaks

Sika Fix - chemical grouts are polyurethane-based and expand into a foam upon contact with water. When injected into leaking cracks, joints or crevices this expansion process forms a seal which stops water infiltration - fast!



1-800-933-SIKA NATIONWIDE

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Sika Corporation (USA)
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 201-933-8800
Fax: 201-933-6225

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

Sika Canada, Inc.
601 Delmar Avenue
Pointe Claire,
Quebec H9R4A9
Phone: 514-697-2610
Fax: 514-694-2792

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