



Rehabilitation of Above Ground Concrete Oxygen Trains

The Problem

The existing coating of the oxygen trains located in this Florida wastewater treatment plant was failing with severe concrete deterioration. The structures are above-ground concrete tanks (approximately 90,000 sq. ft. of substrate) that required the existing coating to be removed, the concrete to be repaired, and a new coating to be applied to protect them from future corrosion. Southland Painting, an Epoxytec Certified Contractor out of Fort Lauderdale, Florida, was contracted to complete this project.

Products that Out-perform

Specializing in epoxies and protective coatings to repair, rehabilitate, coat, and line wastewater and water infrastructure, Epoxytec offers an array of solutions for collection systems. In the case of restoring and rehabilitating these oxygen trains, a three-part system was selected.

Epoxytec Mortartec Silicate was used to repair severely deteriorated portions of the structures. This is an industrial-grade, early high-strength, high-density cementitious mortar. With early curing properties, the mortar is also terrific for resurfacing prior to coating. It has the strength and density suitable for aggressive environments. The mortar may be hand or spray applied and is typically ½" to 2" in depth. Uses include repairing concrete walls and ceilings as well as lining brick or concrete infrastructure. Mortartec Silicate provides an extremely dense matrix and will accept coatings at earlier stages than typical Portland cement repair products.

Epoxytec Mortartec Ceramico was used to resurface the oxygen trains. This is a highly advanced, formulated epoxy blend incorporating cutting-edge epoxide technology with proprietary engineered curing agents, exhibits excellent acid resistance, and has incredible adhesive properties, barrier-sealing capabilities, tolerances, and out-gassing, hydrostatic and MVT

(continued on next page)

Featured Products

Mortartec Ceramico
Mortartec Silicate

Uroflex



Project Information

Location

Miami, FL

Completion Date

April, 2017

Structure

Above Ground Concrete Oxygen Trains

Applicator

Southland Painting



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Rehabilitation of Above Ground Concrete Oxygen Trains (cont.)

reduction.

Uroflex was used as a top-coat liner for this project. Uroflex possesses the advantages of a polyurethane and epoxy together as one technology. It features the novolac- exhibiting superior adhesion, tolerance and strength of an epoxy yet has the flexibility (38% tensile elongation), gloss, and impact resistance of a urethane. The epoxy resin incorporates novolac, thus enhancing its chemical resistance and crosslinking. Uroflex has been CIGMAT tested by the Department of Civil and Environmental Engineering at the University of Houston for construction and rehabilitation of civil infrastructure, undergoing a battery of modified industry specific testing. It is formulated to be "green," that is, environmentally friendly, and is 100% solid (no VOCs, no solvent). The Uroflex coating system is easy to apply by spray, brush, or roller. It conveniently mixes in a one-to-one ratio by volume. Uroflex also self-levels and can be applied in thicknesses up to 65 mils per coat. For long-term maintainability, the Uroflex system ties back into itself indefinitely with no need for re-blasting or abrasion.

The Application

The original surface had a black elastomeric coating that was very challenging to remove. It also appeared to have been very porous, breaking down the concrete behind it in an accelerated way. This made the project more difficult to address than initially anticipated.

After the necessary prep was completed (high-pressure water blasting) and all surfaces were sound, clean, and free of any previous coatings, an inspection took place. The substrate was tested and the initial International Concrete Repair Institute, Inc. (ICRI) profile showed that degradation exceeded a value of 10 with a PH of neutral or better.

This very severe ICRI profile resulted in the decision to bring back all surface profiles using Mortartec Silicate before applying the UME Composite System (Mortartec Ceramico and Uroflex). After all surfaces were brought back to profile using Mortartec Silicate, the cured surfaces were cleaned again using high-pressure water with a spinner-tip. This was necessary to remove laitance and to scale/open up all the pores of the newly applied material. Epoxytec's Mortartec Silicate was used lightly to repair and rebuild deep voids, in the places where the concrete was severely deteriorated.

At this point, Mortartec Ceramico was applied at a thickness between 1/8" and 1/4" and finished with an ICRI profile of between 2 and 3. This epoxy-cured cement brings added benefits that cannot be found in traditional mortar. This was ideal for the 40-50 mil application of Uroflex that followed.

To complete the rehabilitation, two coats of Uroflex (beige and then red) were sprayed on at a total thickness of 40 mils to protect the tanks from future acid attacks and corrosion.

A Final Look

The final walkthrough demonstrated a successful completion of the rehabilitation. All steps were concluded according to specification, all surfaces indicated proper cure of material, and the liner was monolithic. Southland Painting created a saw cut at the bottom of the walls to make sure the coating had a tie in. Southland Painting did an excellent job, following the specifications and even going above and beyond to ensure the final outcome was outstanding.

