Protecting Concrete in Wastewater Environments

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Case Study:

Rehabilitation of the Mississippi Siphon Concrete Chamber

La Crosse, WI
History

- Built in 1936
Purpose of the Structure:

The Chamber was built for the Mississippi St. Sewer and the interceptor from the north and 2 siphons 1 – 24” and 1-30” pipes and a Combined Storm and Sanitary Overflow Structure.
The chamber was built with a weir to direct low flows to the WWTP and allow flows to bypass the siphons and to be discharged to the Isle Plume Slough.
Site Conditions: Extremely Difficult
Interior Chamber
Existing Conditions:
Extreme Deterioration
Scope of Services

Concrete Rehabilitation
New Stairs
New Valves
New Bypass Manhole
New Landscaping
Engineer’s Estimate

$ 540,000
Bids Received

Wapasha Const.  $ 572,656

PCI Roads    $ 617,500

Const Innovations  $ 688,500
Problem:

3.5 MGD
Solution

- By Pass Pumping 3.5 MGD
- 37 Days
Problem

- Over the last 77 years of use a build up of H2S gas had deteriorated the surfaces of the concrete structure
Concrete losses in some areas was as deep as 3” to 4”.

Specifications

- Repair specifications called for a performance based lining system with a 5 year warranty.
Original Submittal

- Concrete Repair
- Polyurethane Based Lining
Problem:
Existing Concrete was very Damp
There was no reasonable way to dry out the concrete substrate in order to use a polyurethane lining system
Solution

Switch to a product that likes moisture, but still provides the H2S resistant qualities
Approved Product

- H2S Resistant Crystalline Water proofing material and resurfacing mortar
Advantage

Crystalline Water proofing and resurfacing materials systems likes and needs moisture to bond and cure properly with sacrificing the H2S Resistance.
Preparation

High Pressure Water Blast
Abrasive Blast Clean the Concrete
Pre-dampen the concrete
Why Inspection?

One chance to get it right
Inspection Services

Surface Preparation
Ambient Conditions
PH Testing: 9 or greater
Complete Coverage
Thicknesses
Resurfacing Mortar

- Mortar was installed at thicknesses ranging between 2 to 3 Inches.