



Saving Infrastructure... One Manhole at a Time

THE PROBLEM

The City of Richmond in western Contra Costa County lies on the northeastern shore of San Francisco Bay and is connected to Marin County by the Richmond–San Rafael Bridge. The Public Works Department in Richmond is committed to “sustain[ing] the environment and infrastructure through responsiveness, innovation and professionalism” (<http://www.ci.richmond.ca.us/276/Public-Works>).

To fulfill its commitment, the department partners with dedicated contractors committed to cost recovery efforts that increase and improve effectiveness and efficiency. This successful manhole rehabilitation project is a fine example of how partnering with skilled professionals using proven products yields results that can provide savings and trenchlessly extend the life of deteriorated infrastructure without the cost and disruption of replacing it.

Hydrogen sulfide (H₂S) is a corrosive compound which, over time, and combined with heavy inflow and infiltration (I&I), deteriorates manholes. That was the case for these manholes in Richmond. H & R Underground were subcontracted to address the issue with the hope that rehabilitation could restore this infrastructure.

H & R Underground is a family-owned and operated company business committed to providing the East Bay area with quality service. H & R Underground are proud members of the Better Business Bureau. Due to the quality and timeliness of their work, they have been awarded “Preferred Vendor” status for California cities such as El Cerrito and Richmond, as well as Contra Costa County Sanitary District, Stege Sanitary District of El Cerrito, and the West County Wastewater District. When presented with this manhole project owner, Horacio Franco contacted coating partner Epoxytec Int’l, Inc.

Epoxytec Int’l Inc. manufactures epoxies and protective coatings and has supplied to and consulted on rehabilitative and protective solutions using epoxies, urethanes and similar technologies since 1996. Their focus is on developing products and systems to repair, rehabilitate, coat and line wastewater and water infrastructure, with ANSI NSF-61 approved epoxy coatings for potable drinking water, and other sewer-grade lining systems. Epoxytec performs inspections and helps prescribe specific protective lining and rehabilitative solutions through the design of specifications for water and wastewater treatment plants, water distribution, sanitary sewer collection systems, manholes and lift stations. The solution Epoxytec suggested for these Richmond manholes involved using Epoxytec’s proven manhole lining system

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Featured Products

CPP Sprayliner



Project Information

Project Location

Richmond, CA

Structure

Manhole

Completion Date

January, 2021

Owner

City of Richmond

Applicator

H & R Underground



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Saving Infrastructure... One Manhole at a Time (cont.)

CPP Sprayliner.

PRODUCTS THAT OUTPERFORM

Epoxytec's CPP Sprayliner was developed specifically for water and wastewater infrastructure. It originated as a trowelable epoxy version and has evolved to meet the needs of contractors. Applicators seeking to utilize plural-component heated spray application can spray Epoxytec CPP Sprayliner ultra-high build between 1/16" – 1/4" (62.5 – 250 mils) per pass. The product is blended with reinforcing agents and various fibers. Once cured, it creates reinforcement lining as a fiber-reinforced-polymer (FRP), with high strength and flexural properties for partially or fully deteriorated structures.

THE APPLICATION

The Richmond manholes were precast and brick, measuring 48 inches in diameter and averaging 10 feet in depth. In addition to the I&I and deterioration of the manhole, the walls were missing mortar between the bricks. In some cases, the manholes were—even worse—missing bricks entirely, posing additional problems. Before application, to prepare the surface, each manhole was hydro blasted and vented to ensure clean air prior to entry into the manhole. Then the deterioration was addressed.

Before the epoxy liner could be installed, extensive surface preparation and repairs were needed. Each area of concern required a different repair solution. To begin, the entire surface of each wall was resurfaced using a hydraulic cement. This process filled any voids. In manholes where entire bricks were missing, bricks were replaced by filling in the areas with micro-silica cement. Furthermore, any severe leaks were injected with grout. Once all the repairs were completed, air was used to ventilate and dry the manholes.

This detailed preparation is crucial to the success of any rehabilitation project. H & R Underground's attention to detail in dealing with the needs of specific problems within the manhole further guaranteed the success of the liner. At this point, H & R Underground was then ready to apply Epoxytec's CPP Sprayliner. As Epoxytec certified contractors, H & R Underground have been trained in using Epoxytec's CPP Sprayliner system. Using a Graco XP70 plural pump set at a ratio of 1:1, they were able to spray CPP Sprayliner at ~150 mils thick. During this installation, the temperature was in the low 50s F, so time was taken to heat the epoxy before it was sprayed. This step allowed for seamless application of the product in a thick, even coat.

FINAL LOOK

In total, seven manholes were rehabilitated over the period of one week. The expertise of H & R Underground, specifically their attention to detail in addressing each manhole's individual needs, allowed for successful rehabilitation in a timely manner. Using Epoxytec's CPP Sprayliner offers many advantages, including a fast cure time. When additional repairs are needed, the fast cure time allows for same-day repairs, which is not an option for all lining systems.

This trenchless rehab afforded the City cost savings and eliminated the undesirable option of replacing aging infrastructure. The collaboration of skilled contractors, proven products, and a City's dedication to excellence led to improvements that will extend the life of this important infrastructure for decades to come.

