

## CASE STUDY



## PROJECT SNAPSHOT

### OWNER

City of Kalamazoo, MI

### EFFECTED STRUCTURE/ DIMENSIONS

- (5) 5' Diameter MH—varied from 4'–13' deep
- (1) 4' Diameter MH—5' deep
- (3) Catch basins—varied from 5'–10' deep
- Material: RCP
- Type: Storm Drain

### CHALLENGES

- Local diesel fuel spill leaking into storm drain leading to nearby river
- Previously applied cementitious coating failed, cracked and leaking

### SOLUTION

- Pipe sections CIPP lined
- Manholes rehabilitated with a combination of I & I Guard®-PRF followed by Structure Guard®

### CONTRACTOR

Vortex Services

### CONTACT

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# Quadex® Structure Guard® 100% Solids Epoxy Used to Rehabilitate the Manholes and Catch Basins

## STORM DRAIN SYSTEM RELINED TO PREVENT INFILTRATION OF DIESEL FUEL CAUSED BY SPILL IN KALAMAZOO TRAIN YARD

### VORTEX PRODUCTS USED

- 1 Structure Guard®
- 2 I & I Guard®-PRF

### THE CHALLENGE

A train yard, located in Kalamazoo, Michigan experienced a diesel fuel spill that required immediate attention. To ensure the fuel would not find its way to the nearby river, a local trenchless contractor was hired to assess the storm drainage system and to reline it if there was any sign of leakage or infiltration. The goal was to prevent the diesel fuel from leeching from the ground and into the storm drain. The original plan called for the pipe sections to be CIPP lined, and for the manholes/catch basins to be coated with a cementitious material. In all, there were six manholes ranging from 4'–5' in diameter and 4'–13' in depth, plus three catch basins that varied from 5'–10' in depth. While the contractor performed the necessary CIPP portion of the project, a sub-contractor was hired to reline the manholes and catch basins. From the beginning, there were problems and concerns with the sub-contractor's ability to properly apply the cementitious liner. That initial concern proved to be valid, since the manholes failed several exfiltration tests.



*Before lining - cracks and voids are noticeably visible in this leaking manhole.*



*After lining with Structure Guard 100% solids epoxy – smooth troweled for an impermeable, corrosion resistant finish.*



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## THE SOLUTION

The contractor immediately sought the expertise of the Vortex Services, a division of the Vortex Companies, for a second opinion on an alternative lining solution to address the leaking manholes and catch basins.

Based on previous success in similar environments, Vortex Services recommended Quadex® Structure Guard®, a 100% solids epoxy coating system, to address and eliminate the potential environmental hazard. Structure Guard is widely known for exceptional bond strength and its long-term chemical and corrosion resistance. To plug the leaking voids and cracks, I & I Guard®-PRF, a fast-setting water stop product, was also specified.



*Vortex Services crew applies Structure Guard®*



*Lined manhole is filled with water for leak (exfiltration) testing. No leaks present.*

## THE CHALLENGES

Due to the presence of diesel fuel in the water system, four gas monitors had to be used for the duration of the project. In addition, an air particle counter monitored petroleum fume levels in the air and water moving downstream was monitored for oil sheen. If it was detected, the fuel was then contained before it reached the river.



*I & I Guard-PRF was applied to fill voids and cracks in manhole and pipe entry points.*

## THE RESULTS

Not only was Vortex Services was able to correct the missteps of the original manhole lining contractor, it also was able to complete the job on time and within budget. In just one week, the crew successfully rehabilitated six manholes and three catch basins of varying diameters and depths.

Once completed, the newly-lined manholes and catch basins were tested for infiltration and exfiltration. In each case, they exceeded the testing standards.



*Cracks reveal failed cementitious liner from original project.*



*If left unrepaired, cracks like this would have allowed inflow of diesel fuel into the storm drain system.*

## GREENBOOK APPROVAL

Greenbook/City of Los Angeles  
Department of Public Works  
Approves Structure Guard®

City of Los Angeles Approved Products  
Select Lining and Coating