

PROJECT OVERVIEW

A southeastern US oil refinery decided to evaluate the condition of its process sewer manholes at one of its refinery sites. Refinery officials discovered the leaks while conducting a routine five year inspection of the process sewer line. Inspection results revealed that many of the manholes and catch basins had begun to leach where the trunk lines entered these structures.

After conducting an initial assessment of the most critical areas, it was determined the primary source of the leaks were coming from poorly sealed annular space around the pipes where they penetrated into the manholes. Although not all the manholes appeared to be leaking, the owner proactively chose to have all of them thoroughly inspected and repaired as necessary.

REPAIR OPTIONS

1. Epoxy Spray Lining

The use of an epoxy system meant extended downtime to clean and dry the manholes prior to application of the epoxy. With these systems, the manhole needs to be dry to avoid delamination and failure of the spray lining.

2. Dig & Replace

Several attempts had been made to dig and replace the manholes. The cost, downtime and effort far exceeded the expectations and was more disruptive to plant operations than a trenchless solution.

3. GeoSpray Spray Lining

The use of a geopolymer lining that could be centrifugally cast, hand sprayed or troweled. The preparation time for the manhole rehab was reduced since a simple jet cleaning and then immediate application of the liner could be completed. There was no need to wait for the manhole to dry.

SOLUTION

The GeoSpray mortar liner was selected due to speed of application, chemical resistance and the ability to provide a long-term structural solution.

All manholes were washed and several required an acid bath to remove chemical build-up. All voids and excessive annular space was filled with a hydraulic cement or non-cementitious grout to stop leaks and infiltration.

The GeoSpray mortar was applied using a 5000 rpm rotary spinner. Although a one-inch thick application would provide a fully structural repair, the client chose a 1.5-inch thick lining to extend the life of the manholes.

PROJECT DETAILS

Location: Garyville, LA

Application: Industrial Manhole Rehabilitation

Client: US Oil Refinery

Installation: Summer 2013

Installer: Inland Pipe Rehabilitation



Completed manhole ready for service after eight hours.



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GEO SPRAY[®]

Geopolymer Mortar



CASE STUDY:

Garyville, LA Industrial Manhole Rehabilitation

RESULTS

The manholes were put back into service within 24 hours of cleaning and application. A total of over 700 manholes were rehabilitated with additional catch basins repaired as well.



Manhole renewed with GeoSpray geopolymer.



Centrifugal spraying of GeoSpray geopolymer.



Hand spraying of GeoSpray mortar in catch basin.



One of several hundred leaching and deteriorated manholes.



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