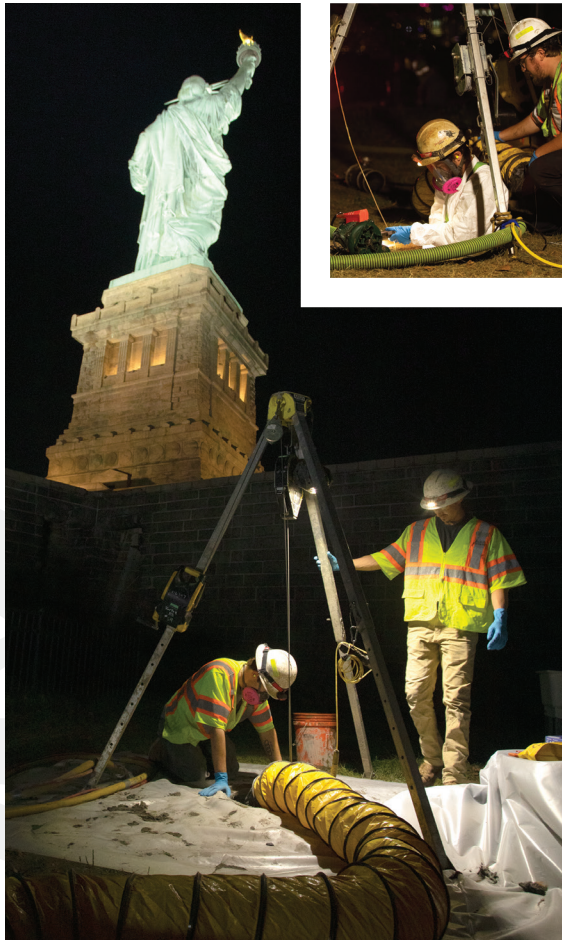


CASE STUDY

Multiple Trenchless Technologies Used to Rehabilitate Aging Infrastructure on Liberty Island, Home of the Statue of Liberty

UV CIPP LINER AND GEOKRETE® GEOPOLYMER MORTAR STRUCTURALLY RESTORES MANHOLES AND RELINES AGING SEWER LINER WITHOUT THE NEED FOR DIGGING



TRENCHLESS SOLUTION APPROACH

Non-disruptive, environmentally friendly trenchless solutions were used to restore the island's aging infrastructure



AVOIDED CLOSURE OF THE PARK

Trenchless sewer repairs performed at night, allow Liberty Island to open each morning to welcome the day's approx. 20,000 visitors



1 WEEK VS. 3 MONTHS

By going trenchless, sewer line fully restored in one week vs. dig/replace that would have taken up to three months resulting in lost revenue

PROJECT SNAPSHOT

Project

Liberty Island Trenchless Sewer Rehabilitation

Contractor

Vortex Services - Northeast

Problem

Liberty Island's main sewer was not only deteriorated it was more than 80% blocked with grease and waste and seriously taxing the sewer system. The brick Manholes were severely deteriorated, with mortar crumbling, and desperately needed structural restoration.

Dimensions

- 700 LF of clay (6") and cast-iron pipe (8")
- 5 manholes (48" dia. x 5-8 ft deep)

Overview

Implemented completely trenchless applications resulting in zero need for "dig and replace" methods, and allowed Liberty Island to remain open for tourists

Trenchless Applications

- UV CIPP Lining System - Sewer Pipe
- Spray applied GeoKrete® Geopolymer - Manholes

THE CHALLENGE

A 700 LF sewer line on Liberty Island — home to the Statue of Liberty — was deteriorating and approaching complete blockage. The old sewer, consisting of 6 in. clay and 8 in. cast iron pipes, along with five 48" dia. x 5 ft. deep manholes, was operating at less than 20% efficiency due to years of waste build-up. With no action, the pipes would have completely clogged in a matter of weeks. The red vitrified clay brick sewer manholes contained deteriorating mortar, no real inverts or shelves, sulfide damage, debris disrupting the flow, and missing grout.

Replacing the system would mean shutting down the island for at least three months, and the enormous cost of mobilizing excavating equipment, pipe and manhole materials, and installation equipment would have been astronomical. The island, which attracts 20,000 visitors a day, stood to lose revenue, and tourists visiting New York for the first time would not be able to visit one of America's most important monuments.

THE SOLUTION

Barnard Construction, the Island's long-time site contractor sought advice from Vortex Services, a trenchless infrastructure solutions provider, to assess the situation and offer an alternative solution. Vortex officials recommended a completely trenchless solution to rehabilitate the sewer lines and manholes after inspection. Island officials and its utility contractor were convinced it was the best way to ensure that the island could stay open for tourists.

The project would be completed overnight so the park could remain open during the day. This project required special clearance and the barging of all equipment to the island to perform the installation. Each evening, Vortex's nine-man crew headed to Liberty Island to perform its work.

The process included jet cleaning and prepping the sewer line and manholes for rehabilitation. For the manholes, GeoKrete® geopolymer was spray-applied to approximately 1" thick, troweled, and brushed to a smooth finish to restore full structural integrity. The sewer pipe was relined using the UV CIPP process, which was recommended for its environmentally friendly design and quick cure ability given the limited time the crew had to install each night.

THE RESULTS

Vortex finished the job in 6 working days, completely restoring the sewer pipe and manholes to like-new condition. The post-installation inspection results were reviewed and approved by the contractor. GeoKrete provided a full, structural restoration and UV CIPP lining was the most environmentally conscious and efficient way to bring the sewer to full operating condition.

"We could not be more pleased with the results," added Warren Hook, Barnard Construction. These rehabilitation methods prevented a potential sewer failure as well as a closure of the island which would have resulted in lost revenue and thousands of disappointed tourists.

Renewed Sewer System Fully Structural & Corrosion Resistant

- GeoKrete Geopolymer restored manholes to full structural integrity
- UV CIPP liner delivers standalone pipe strength and improves sewer flow characteristics
- Both products are considered environmentally friendly and require a minimal construction footprint



Vortex Services installation crew inserting the UV light chain into the manhole to begin the UV curing process.



Manholes were deteriorated and leaking.

GeoKrete geopolymer was applied to structurally reinforce the manhole.



A glider foil, installed prior to inserting the UV liner, reduces friction during liner pull-in process.

Liner being cured with UV light chain.