CASE STUDY

FEATURING

GeoKrete® BY VORTEX

GEOKRETE® SOLUTION TO REHABILITATE CMP CULVERT BENEATH MAJOR CONNECTICUT HIGHWAY

A Truly Trenchless Solution Was Required To Restore A Collapsing Culvert

PROJECT SNAPSHOT

Project
- Reidville Drive Culvert Rehabilitation

Owner
- City of Waterbury, CT

Problem
- 60 year-old CMP culvert pipe running beneath highway had voids above pipe. Invert corroded and missing in some parts. Sink holes forming.

Dimensions
- 103″ x 71″ CMP, totaling 130′ in length. A unique and odd-shaped culvert

Project Challenges
- Dig and replace not possible. Culvert ran beneath I-84 a major thru-way
- Rehabilitation required to address odd shape of the culvert, therefore CIPP was not an option
- Flow capacity could not be reduced, therefore slip lining was not an option

Project Challenges
- Snapshot Bullet

Solution
- The Quadex Lining System® featuring GeoKrete® geopolymer. A 2″ layer of geokrete was hand-sprayed, then troweled, restoring the old culvert to full structural integrity.

Contractor
- Quadex Lining Systems®

Job Completed
- Spring 2018

CERTIFIED REDUCED CARBON FOOTPRINT

Compared to Baseline for Trenchless Repair Systems for Structural Rehabilitation of Civil Infrastructure

SITUATION

A 60 year-old CMP storm culvert running beneath I-84 in Waterbury, CT had begun fail. A combination of settling, partial collapse and corrosion had created sink holes in the road above the culvert, making travel hazardous. Without replacement or rehabilitation the culvert would ultimately collapse.

The culvert itself was odd-shaped. At 103″w x 71″h, rehabilitation options were limited. And, since it ran beneath the highway, City officials said replacement was out of the question. It would have been too costly and disruptive.

Collapsing culvert prior to QLS installation.

Culvert after full structural rehabilitation using GeoKrete geopolymer.

SOLUTION

The unique shape of the CMP culvert quickly eliminated both CIPP and slip lining as possible repair methods. CIPP would not conform to the shape and slip lining would reduce too much flow capacity. Ultimately the city chose the Quadex Lining System, which is a spray applied lining system utilizing GeoKrete geopolymer, and known for its exceptional corrosion resistance and structural properties.

After cleaning and prepping the 130' long culvert, larger voids were filled and patched before spray apply the GeoKrete. Over the next few days, the QLS crew spray-applied to a uniform thickness of 2", then smooth finished with a trowel. At this thickness, there was only minimal reduction in flow capacity.

Versatility of GeoKrete, Unique Bypass and Experienced Crew Add Up To Completely Trenchless Installation

An advantage of the QLS process is that GeoKrete can bond to itself, allowing the crew to apply in a controlled fashion and even stop and restart if necessary. Additionally since this project called for hand spray application the bypass was able to be set up inside the large culvert. To achieve this, a bulkhead was installed upstream that allowed flow to build up and then be gravity-fed into a 18" HDPE bypass pipe. This innovative approach allowed the entire scope of the project to be performed in a completely trenchless manner, with no impact to the heavily used road overhead.

THE QLS PROCESS

Even with extensive invert loss and a collapsing crown, the project still only took 8 working days to complete. The end result is a fully structural, corrosion resistant, monolithic liner that will provide another 50 years of service.

Corrosion in the invert weakened the culvert and also caused severe I/I.

A completely internal bypass system, including a bulkhead, was installed to capture and control stormwater flow during the project.

GeoKrete can be hand or spray applied depending on shape and condition of the pipe or structure.