

## CASE STUDY



### FEATURING



### PROJECT SNAPSHOT

#### Project

- D-4 Pump Station Stormwater Outfall Rehabilitation

#### Owner

- City of Palm Beach, FL

#### Location

- 478 N Lake Way, Palm Beach, FL 33480

#### Effected Structure/Dimensions

- Material: RCP
- Type: Storm Drain
- Diameter: 52" H x 90" W
- Length: 350'

#### Project Challenges

- Pipe under water much of the time required innovative bypass solution. Limited access to pipe required heated hose system to maintain proper epoxy temperatures.

#### Solution/Results

- Combination of Quadex® water stoppage products and Structure Guard® 100% solids epoxy to address infiltration, delamination and corrosion.
- Adhesion testing exceeded spec by 200%.

#### Contractor

- Vortex Services

#### Job Completion

- July 2018

#### Contact

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## PUMP STATION OUTFALL REHABILITATION IN PALM BEACH, FLORIDA PREVENTS FUTURE DAMAGE TO HOME AND ROAD

A Failing, 350 LF Stormwater Outfall, in an Exclusive Palm Beach, FL Residential Community, is Fully Rehabilitated to Avoid Imminent Damage and Potential Sinkage of Nearby Home.

### SITUATION

A stormwater outfall serving an exclusive residential community in Palm Beach, Florida had been deteriorating for years. Its proximity to the intracoastal waterway and exposure to a saltwater environment had simply taken their toll. Previous attempts to restore the pipe's integrity had failed and the city was seeking a more permanent structural rehabilitation solution.



Before



After



## SITUATION (CONTINUED)

Without a quick repair, there were legitimate concerns about the outfall's structural integrity due to its continued degradation. If the pipe collapsed, sink holes could have formed and a nearby home and road above would have suffered severe damage as a result.

## SOLUTION

Vortex Services recommended a full pipe rehabilitation system to address water infiltration, delaminating concrete and corrosion.

However, before any work could be performed, a bypass system had to be put in place to dewater the pipe daily due to the rising and falling tide related to the intracoastal waterway.

Once in place, the Vortex Services crew performed the following applications to attack the problem:

- **Pipe Prep:** Marine growth and cold tar epoxy from early repair attempts had to be removed via a combination of sand blasting and hydro blasting.
- **Arrest Water Infiltration:** I&I Guard®-PRF, a polyurethane grout, and Quadex® Quad-Plug® were used to stop the fast flowing leaks from cracks and large gaps.
- **Address Delaminating Concrete:** The crew removed loose material with hammer drills and angle grinders, then primed and repaired the wall with with a hydraulic cement and gel coat.
- **Apply Corrosion Protection:** Quadex Structure Guard® 100% solids epoxy was spray applied at 175 mil for structural enhancement and corrosion resistance.

## UNIQUE CHALLENGES

The exceptionally high rate of dewatering required an innovative solution to the bypass. Because of normal tidal flow, the outfall was completely submerged under water a significant portion of the day. In order to dewater the tunnel, the Vortex Services crew designed a steel box that was bolted to the pipe wall to attach the bypass pumps. Due to the consistently high water level, this had to be performed by a dive team.

Also, the tunnel only had two entrances, one at the pump station and one at the pipe's exit into the waterway. When applying the Structure Guard, a special 300 ft. heated hose extending from the sprayMASTER® II was used in conjunction with a remote mixing block. This was necessary to maintain consistent epoxy temperature and have the ability to spray the entire length of the tunnel. This is a unique feature of the sprayMASTER II system. Any other spray rig could not have performed this task.

## RESULTS

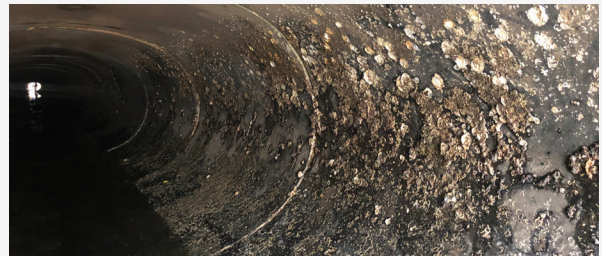
Despite the challenge of keeping the outfall dewatered, the project was a success. The engineering design and approach to the solution more than satisfied the project objectives. The Vortex Services crew worked through difficult conditions to successfully rehabilitate the outfall. Additionally, a third party, NACE Level 3, protective coatings inspector walked the job and approved the application. The adhesion test, which has been performed several times, continues to exceed the spec by 200%.



Clear evidence of concrete delamination in the D-4 Pump Station.



Leaks at the pipe joints were prepped and sealed with I&I Guard-PRF.



Concrete was deteriorating and joints were leaking.



Daily dewatering was necessary due to outfall's proximity to the intracoastal waterway.



Residential community near D-4 Pump Station.

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