



Project Overview

FRP REPAIR OF CONCRETE CULVERT

Name: St. Croix Culvert Repair
Type: Pipe
Location: St. Croix, VI
Completed: November 2012

PROBLEM

As part of a new highway construction project, 72" diameter concrete pipes were used for the culvert. The pipeline consists of 36 pipe sections: 8 Ft. Starting from the lowest end, pipe 1 to 10 are class III, pipe 11 to 32 are class IV, and from pipe 33 to 36 are class III. The concrete pipes were manufactured by Hanson. The pipes were covered in as much as 37 feet of fill in certain locations.

Prior to the opening of the freeway to traffic, the pipes experienced severe cracking and some spalling in the concrete over much of the 280-ft long culvert. Considering the deeply buried location, replacement of the pipe was cost-prohibitive. An in situ repair and strengthening that would be feasible for this remote island was necessary.

SOLUTION

It was determined that the reinforcing steel for these pipes was not sufficient. The repair consisted of patching the deteriorated concrete with a polymer-modified mortar; sealing the cracks and injecting resin into the cracks; applying a 10-mil thick layer of QuakeBond™ J300SR to seal the entire surface of the pipe, and strengthening the pipe surface by application of a single layer of QuakeWrap® VB26G fabric, saturated with resin. The entire pipe was then coated with a top coat for further protection against abrasion. The repair was completed in less than two weeks with a small 4—man crew



Technical Highlights

- FRP repair provided additional reinforcement to supplement the existing steel reinforcement
- The fully sealed pipe is protected from moisture/oxygen ingress and this will minimize any future corrosion of the pipe
- Repair was performed in a short time at a remote site.

Credits

Project Manager: U.S. Federal Highway Administration
Structural Engineers & Materials: QuakeWrap, Inc.
General Contractor: VI Paving, St. Croix, U.S. Virgin Islands

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