

Columbia, KY RCP Culverts

Our purpose is to help customers choose solutions which will insure that the process fits the application and do this reliably and cost-effectively. All information in this field report will assist the engineer to reduce cost and minimize future maintenance costs.

Abstract

The prime contractor for the Columbia Bi-Pass project for the Kentucky Department of Transportation District 8 faced an expensive problem with little time for decision making. This Field Report presents an existing application where an installation of a Reinforced Concrete Pipes (RCP) pipe just one year before was failing and rehabilitated using Snap-Tite HDPE Pipe.



You can see the cracking and exposed re-bar on the original RCP.

Introduction

Columbia, KY had built a new stretch of highway and overpass in 2007 to alleviate traffic in the downtown area of Columbia. One year later the two 60-inch RCPs were direct buried over 40 feet of fill, the pipes started to fail, causing major concern with the KY DOT. There was a need to evaluate a less costly alternative repair method than to dig up the new stretch of road.

The Problem

Cracking along the parts of the culvert were popping up, along with exposed re-bar inside the pipe. The joints started to separate, exposing the gaskets. On the southbound pipe the water on the inlet side was actually flowing under the first two sections of the RCP pipes. And, in one part of the northbound pipe, the RCP had collapsed over eight inches. At this rate, the culvert was due to collapse at any moment.

The Solution Applied

Ryan Harrington, the Snap-Tite manufacturer's representative, received a call from the KY DOT District 8 office in order to learn if Snap-Tite was a viable solution to rehabbing their problem. Harrington spoke with Mark Robertson, resident engineer for District 8, as well as with other DOT employees about the benefits of Snap-Tite. Robertson then put Harrington in contact with the contractor to discuss Snap-Tite as the solution for the problem at hand. After a site visit to look at the problem first-hand, it was determined that with 54-inch Snap-Tite, the culvert would actually have a four percent greater flow rate due to the smooth-wall interior.

Harrington also provided a direct-bury load analysis on Snap-Tite HDPE Pipe since the RCP was in such poor condition. The analysis showed that with proper grouting and installation, Snap-Tite would exceed their expectations of having the pipe close to 50 feet beneath the road.

Harrington then brought in Chris Wisheart with Indiana Reline to perform the installation. The contractor, with the approval from District 8, decided to proceed with Snap-Tite as its method of choice for the application. Snap-Tite and Indiana Reline moved quickly to build the pipe, ship it, snap it and install it



and cables. "Hot soils" do not affect Snap-Tite, as the HDPE pipe works well in any pH range, with no corrosion.

The Snap-Tite Solution

- Meets AASHTO Standard M-326 for rehabilitating culverts.
- Flexibility to insert into misaligned concrete or rusted partially collapsed corrugated metal pipe.
- Tough, but thin, sidewall to give the highest flows possible after lining. The Snap-Tite joint makes a solid mechanical connection that can be pushed or pulled.

before the RCP collapsed anymore.

Before the crew snapped and installed the Snap-Tite liner, they prepped inside the old culvert. They installed grouting tubes along the top of the culverts and pumped grout on the inlet side of the southbound pipe to get the water to actually flow inside the culvert instead of under it. Then Indiana Reline snapped the pipe together and inserted it into both culverts. Once they pushed the pipe completely into the space, the crew built bulkheads on each end of the pipes to keep the soon-to-be pumped grout from flowing out.

They then grouted the liner into place a few days later, completing the project with a culvert better than before and with increased flow capabilities.

Because of Snap-Tite's 'snap' joint, the process increases the speed and ease of installation. It features a watertight ASTM-approved gasket to withstand the grouting application. No special equipment was necessary other than a backhoe, shovels, chain binders

Generally, as with any engineered system, time and usage are needed to generate acceptance. We are pleased to say that Snap-Tite has experienced a growth of envious proportions. We attribute this to consistently successful results and the overall flexibility of the Snap-Tite system.

For more information on Snap-Tite please visit www.culvert-rehab.com.



The completely rehabilitated culvert.



The Snap-Tite installation.

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