Concrete Cloth™

Geosynthetic Cementitious Composite Mat (GCCM)

CASE STUDY:

Knox County Culvert Lining

Project Overview

This existing 9-foot diameter corrugated metal pipe (CMP) was corroding or rusting through the invert or base of the pipe. At some points, water was just beginning to undermine the culvert, forcing the township to take some action or risk affecting the roadway embankment and potentially forcing an unscheduled replacement of the culvert. Stormwater runoff in this agricultural area magnifies the corrosion rate of the metal culvert, either as a result of the areas soils or fertilizers used, or both. In addition, there was beginning to be some significant erosion at the inlet and outlet of the culvert, which needed to be addressed.

Solution

The township considered pouring concrete in the invert to reestablish the bottom of the pipe. Liners and complete replacement were also considered but they were deemed too expensive. Further complicating some of these options was the difficult access to the inlet and outlet of the pipe. Nature had created a stilling basin at the outlet of the pipe and the flow of the water course at the inlet along with fencing impacted what would be easy or difficult during the project.

Once a road commissioner and county engineer agreed to share the cost with the township using joint bridge funds, the project was able to move forward. "This (Concrete Cloth) seemed to be so logical a solution, I wanted to try it," said the road commissioner.

Day 1 Access to the site was cleared and riprap was placed nearby. In addition, a load of rock was staged close to the culvert ends so that the remaining riprap could be placed after the Concrete Cloth GCCM was installed.

Day 2 Concrete Cloth GCCM was placed, hydrated and powder-actuated fasteners were used to fix the material to the culvert. The entire second day of work took 2.5 hours to complete.

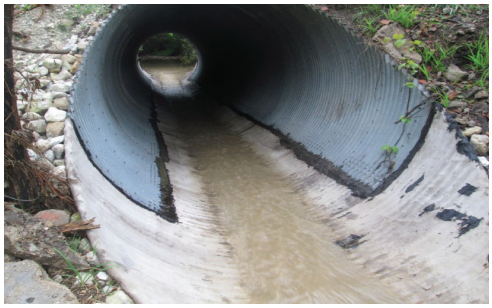
Day 3 25 gallons of mastic were used along the high end of the Concrete Cloth GCCM near the spring lines of the pipe to prevent water from getting between the material and the metal culvert.

Results

"With the freezing and thawing in the Midwest being so dramatic we are really hoping this holds up. Looks like it should last 50 years to me," said the Road Commissioner. Everyone associated with the project was very pleased with the look and its ease of installation as well as anxious to look at the project in the spring to see how it holds up to an Illinois winter. The contractor indicated that he would like to install the material at other locations in similar applications as the installation went quickly and Concrete Cloth GCCM is easy to install.

Project Details

Location: North of Yates City, Illinois
Aplication: Culvert Invert Lining
Client: Elba Township, Knox County, IL
Installation: August 2014



Rehabilitated CMP invert.

Licensed from CONCRETE CANVAS™

MILLIKEN INFRASTRUCTURE
A Milliken COMPANY

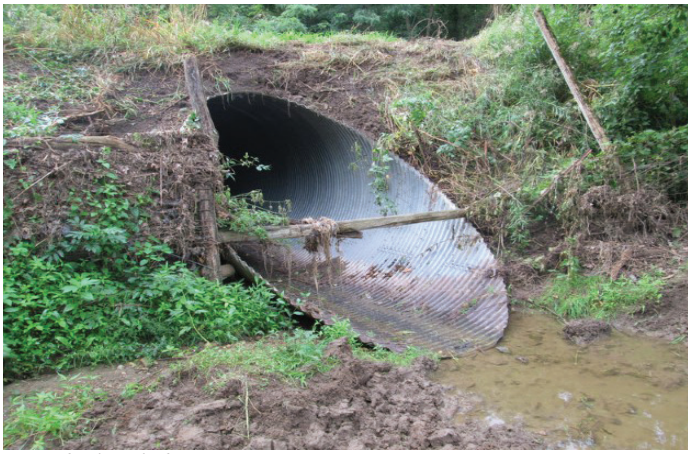
infrastructure.milliken.com | 855.655.6750

Concrete Cloth™

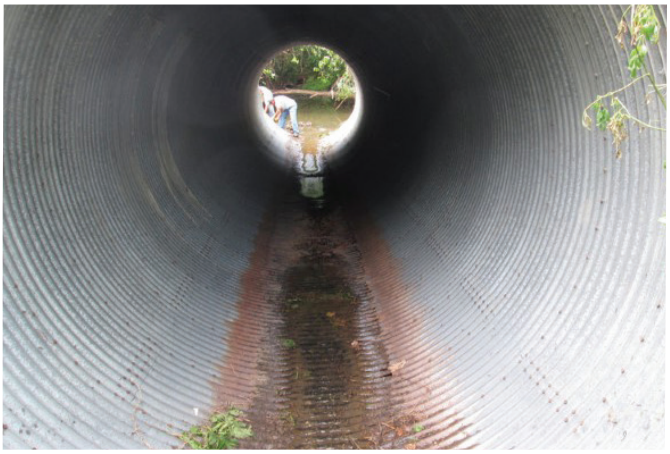
Geosynthetic Cementitious Composite Mat (GCCM)

CASE STUDY:

Knox County Culvert Lining

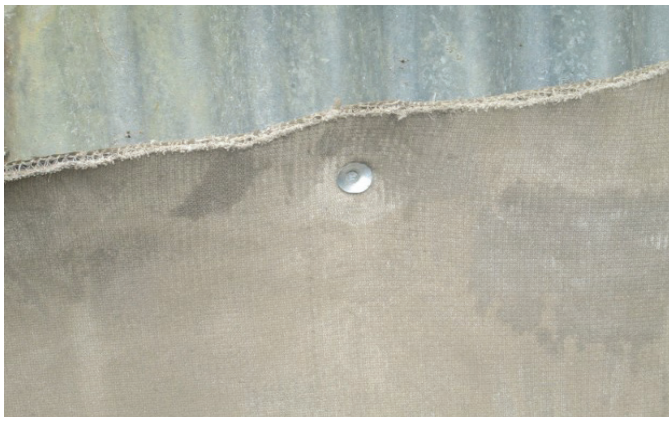


State of culvert before repair.

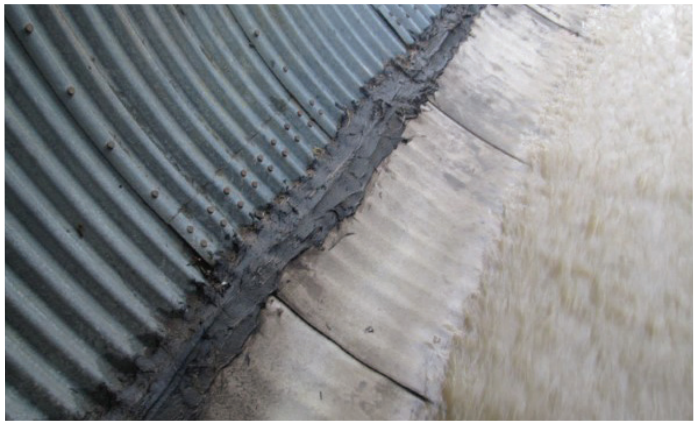


Signs of corrosion on invert.

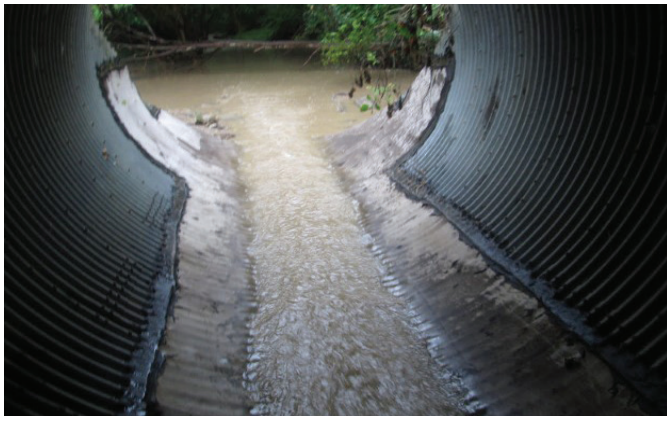
Positioning Concrete Cloth material laterally in invert.



CC8 secured to the culvert spring line with Ramset fasteners.



Sealing Concrete Cloth to spring-line.



Internal view of completed installation with flow.

CC1022-0318