



Project Overview

REPAIR & STRENGTHENING OF PCCP CONCRETE PIPE WITH CARBON FRP

Name: San Juan Generating Station, PNM
Type: Industrial Facility
Location: Farmington, NM
Completed: October 2007

PROBLEM

Due to corrosion of reinforcing wires, several sections of 10-ft diameter Prestressed Concrete Cylinder Pipe (PCCP) in this coal burning plant required strengthening. Design requirements called for additional strength in both hoop and longitudinal directions. Access for the pipe was available only through a 30-inch diameter manhole. This required re-design and manufacturing of the equipment.

SOLUTION

A special PipeWrap™ Carbon fabric was developed for this project to achieve the strengthening requirements with a **single layer** of fabric – instead of **two layers** as the original design called for. Samples were constructed and tested to demonstrate the feasibility of the solution. 50-inch wide bands of fabric were applied in the hoop direction, with a single overlapping joint along the bottom of the pipe. There was a small steel section in the pipe; that was wrapped first with a layer of glass fabric (shown on the right) to avoid galvanic corrosion. The entire repaired section was coated with a layer of high chemical resistant coating.

Due to time limitation, two crews were employed. This allowed the project to be completed ahead of schedule.



Technical Highlights

- 700 linear feet of a 10-ft diameter PCCP were strengthened with Carbon FRP
- 27,000 ft² of a specially designed carbon fabric was used; this fabric allowed the pipe to be strengthened with only a single layer of fabric, compared to the previous phases at the same site that were done with two layers
- All equipment were re-designed and/or modified so that they could fit into the pipe through the 30-inch diameter manhole
- Strengthening was completed ahead of schedule



Credits

Engineering and Materials: QuakeWrap, Inc., Tucson, AZ
FRP Installation Subcontractor: FRP Construction, Tucson, AZ
General Contractor: Riley Industrial Services, Farmington, NM

This project received the 2008 Award of Excellence from the International Concrete Repair Institute (ICRI).

“The FRP Retrofit Experts”