

LOW-FLOW SEWER PIPE INFRASTRUCTURE

Engineers for the City of Mishawaka's new low-flow sewer infrastructure project are going the extra mile to protect concrete pipe, manholes and lift stations from exposure to hydrogen sulfide (H₂S) gas permeation and microbiologically induced corrosion. Series 436 Perma-Shield FR, a spray-applied, high-build, fiber-reinforced epoxy liner designed to withstand severe wastewater conditions, was applied to more than a mile of sewer pipe and connecting structures in 2006.

"The specifying engineer had been shown the benefits of Perma-Shield FR over the conventional coatings that were originally considered," according to Tnemec coating consultant Michael Land. "After reviewing Tnemec's Severe Wastewater Analysis Test (S.W.A.T.) results along with other articles written on the effects of H₂S gas, the switch to a high-performance coating system was made."

The project was specified in Indiana and the pipe was manufactured and coated in Michigan. The Premarc Corporation in Grand Rapids fabricated the 48-inch diameter concrete pipe in 10-foot sections. Kooi Industrial Painting, Co., Grand Rapids, Mich., mechanically prepared each section by dry-abrasive blast cleaning in accordance with SSPC-SP13/NACE No. 6, ICRI CSP5, prior to coating application.

A prime coat of Series 161 Tneme-Fascure, a corrosion-resistant polyamide epoxy, was applied to the pipe, followed by a coat of Series 436 Perma-Shield FR, an abrasion-resistance, fiber-reinforced modified polyamine epoxy designed to wastewater immersion and fume environments. "Series 436 was applied with a high-pressure, airless spray pump," Tnemec coating consultant Ken Hartwig noted.

"The applicator sprayed five feet from the center of each pipe starting at one end, then repeated the process from the opposite end to create a seamless coating barrier against severe wastewater corrosion," said Hartwig. "The total project required more than 1,600 sections of pipe."

Manholes and lift stations were abrasive blast cleaned in accordance with SSPC-SP13/NACE No. 6, ICRI CSP5, then coated with Series 436. Prior to the Series 436 application, the manholes received a thin overlay of Series 218 MortarClad, a modified epoxy cementitious resurfacer, where needed. "An estimated 2,500 to 3,000 gallons of material were used for the total project," Land added.

The project is part of an expansion of the Mishawaka Wastewater Treatment Plant to increase average design capacity from 12 to 20 million gallons per day for continued growth in the community and to cut annual combined sewer outflow volume in half. Work on the expansion started in 2004.

FEATURED PRODUCTS

Series 218 MortarClad

Series 436 Perma-Shield FR



PROJECT INFORMATION

Project Location
Mishawaka, Indiana

Project Completion Date
Winter 2006

Owner
City of Mishawaka

Engineer
Lawson-Fisher Associates, PC

Applicator
Kooi Industrial Painting Co.
Grand Rapids, Michigan

The sewer interceptor pipes at the City of Mishawaka's Low-Flow Sewer Infrastructure project in Indiana are lined with Tnemec's Series 436 Perma-Shield FR, a 100% solids, fiber-reinforced polyamine epoxy for elevated H₂S resistance.

