

BETTER MOUSETRAPS



A manhole is shown before and after lining with the epoxy coating system. (Photos courtesy Wastewater Collection Division, Miami-Dade Water and Sewer Department)

BETTER MOUSETRAPS

PRODUCT:

Concrete polymer paste (CPP) and epoxy coating (Uroflex)

APPLICATION:

Manhole rehabilitation

BENEFIT:

Effective sealing against I&I

USER:

Wastewater Collection Division, Miami-Dade (Fla.) Water and Sewer Department

MANUFACTURER:

Epoxytec

WEB SITE:

www.epoxytec.com

PLUGGING THE GAPS

An epoxy coating system helps a Florida sewer department cut off I&I from manholes and drive down sanitary sewer overflows

By Scottie Dayton

A 1992 consent order from the U.S. EPA to reduce sanitary sewer overflows started the Wastewater Collection Division of the Miami-Dade (Fla.) Water and Sewer Department on its formal I&I program.

Precast concrete manholes corroded by sulfuric acid were the primary contributors. Crews repaired them using grout and Type 2 cement. Meanwhile, operators at the South District Wastewater Treatment Plant were successfully

combating concrete and metal corrosion with Uroflex semi-structural (flexible) urethane-modified epoxy coating from Epoxytec.

Because the product was in the county system and easy to buy, Rod Lovett, Wastewater Collection Division chief, tried it. "Every material we use is tested, so we selected a pilot manhole and observed the coating over 12 months," says Lovett. "It still looked good after a year, and we adopted it as an approved product." He reports

that manholes treated with the coating 10 years ago still have no signs of corrosion.

55 and counting

More than 6,000 miles of sewer lines traverse the division's 360-square-mile service area. The 6- to 72-inch gravity collection lines are 75 percent vitrified clay pipe. The 4- to 102-inch pressure lines are mostly ductile iron, although the larger pipes are prestressed or reinforced concrete. More than

one-quarter of the system was built in the early 1950s, and there are more than 80,000 manholes.

To inspect the entire sewer system and comply with the consent order, the city increased its fleet to 16 vans outfitted with equipment from CUES Inc. As part of the order, the division adopted a volume sewer customer ordinance that required a certain number of inspections per year.

“Those inspections generate the sewer work we do that year,” says Lovett. “For example, we have 3,000 manhole repairs scheduled for 2010. That’s repairs, not manholes. Each structure could have two or three different problems.”

Clean and roll

The county has 11 cross-trained repair crews in different locations. Manhole rehabilitations are grouped by area to minimize travel. A crew with a Model 4025-600 truck-mounted pressure cleaner from US Jetting LLC precedes the repair trucks. The men prepare the surfaces, jetting at 4,000 psi/25 gpm down to bare concrete or substrate.

Confined-space entry pullover suits and equipment provide adequate protection for the worker applying the Epoxytec CPP (concrete polymer paste) or epoxy coating. “They sometimes need respirators, but that’s to meet OSHA requirements,” says Lovett. “In shallow manholes, the men wear just dust masks.”

The CPP, applied with a trowel to fill voids or restore the manhole to its original contour, dries in 30 minutes. The manhole walls do not have to be dry before the CPP is applied. “Having moisture-tolerant products is very important because of the damp environment in sewers,” says Lovett.

The Uroflex coating, applied with a paint roller, adheres to the concrete substrate even if moisture is present. It dries in 30 minutes. A three-man crew can rehabilitate an average manhole in four to five hours.

Manholes are rehabilitated on

an as-needed basis, since not all experience severe enough corrosion to warrant it. While the coating can be sprayed on, the division finds rollers just as effective and more budget-friendly.

“One of the things we like about these products is that they don’t require special or proprietary equipment to apply,” says Lovett. “Anybody can do it after a brief training session. In fact, if you know how to put in cement products, you probably can install the filler paste and coating.”

Locating sources

Infiltration determines when the department conducts sanitary

sewer evaluation surveys. To locate infiltration sources, they meter all the basins — collection systems flowing to a particular pump station — and inspect basins with flows of 5,000 or more gallons per inch-diameter-mile every 10 years.

“We convert all the different pipe sizes to inch-diameter-miles for comparison, then look at the gallons in our night flow metering for each diameter mile,” says Lovett. Basins with less than 5,000 gallons per inch-diameter-mile are rarely surveyed. The department’s goal is to inspect 1.5 million feet of sewer pipe per year and include some of these overlooked basins.

The I&I program has reduced

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SSOs to small, low-volume (5- to 100-gallon) overflows, mainly due to blockages in the gravity mains. “We think the paste and epoxy coating are working,” says Lovett. “The materials are moisture-tolerant, bond well and are easy to use. Our repair crews simply load the containers into the trucks and gear up for confined-space entry.” ♦

Confined-space entry gear protects a worker from contacting the concrete polymer paste as he trowels it into voids and restores the manhole to its original contour.



The concrete polymer paste restores manholes by filling voids. This manhole is ready for coating.

MORE INFO:

CUES Inc.
800/327-7791
www.cuesinc.com

Epoxytec
877/463-7699
www.epoxytec.com

US Jetting LLC
800/538-8464
www.usjetting.com