CIPP in the Desert

Market Segment:	Sewer Rehabilitation
Composite Application:	New Sewer Liner
Resin:	Vipel® Isophthalic Polyester
Manufacturing Process:	Cured-in-place pipe
Diameter:	54 to 90 inches (137 to 229 centimeters)
Installed:	2002-2005
Location:	Phoenix, Arizona

To repair large diameter concrete pipe, new liners were created by impregnating miles of Insituform® felt with Vipel resin. (Image is used courtesy of Insituform Technologies, Inc.)

On the surface, the Phoenix, Arizona, metropolitan area is a bustling community with one of the fastest growth rates in the United States. Below the surface, corroding sewer lines threatened to bring major disruptions to the pace and flow of this dynamic desert region. The solution to keeping the area on the move has been new cured-in-place pipe (CIPP) made by Insituform Technologies, Inc., with Vipel® corrosion-resistant resin from AOC.

According to Casey Smith, District Manager for Insituform, over the past several years, approximately 25 miles of concrete sewer pipe have been refurbished in Phoenix and surrounding cities with CIPP technology. The vast majority of that work can be attributed to the Insituform-AOC collaboration. The rehabilitated concrete piping ranges in diameter from 54 inches to 90 inches (137 to 229 centimeters) and is 20 to 30 years old, depending on the location.

When the original pipe was installed, unlined concrete was considered state-of-the-art for the application. Over time, the desert environment -- where on average 89 days per year reach at least 100°F (38°C) -- unveiled an unusual problem.
Elevated sewage temperatures in combination with long transit times in some interceptor sewers led to increased levels of hydrogen sulfide gas, which in turn caused in-

creased formation of sulfuric acid in the headspace of the sewers. These acids aggressively attacked the unlined concrete sewers above the sewage surface -- often corroding away inches of concrete wall and rebar.

New liner preserves old pipe

"To stop the corrosion and improve the pipeline's structural integrity, a new Insituform® liner was formed inside the existing pipe," says Bill Moore, Material Manager for Insituform. "The Phoenix area has grown dramatically since the original pipe was installed. Digging trenches to reach the problem would be even more costly and disruptive than the original installation was back then. But the Insituform process eliminates the need for open cuts. Instead, the resin-impregnated Insituform felt tube that becomes the new liner is inverted through access points on the surface, usually existing manholes."

For the Phoenix projects, the Insituform felt was impregnated with a Vipel corrosion-resistant isophthalic polyester from AOC. The Vipel-impregnated tube was inverted (turned inside out) into the "host" concrete pipe as water pressure moved and navigated the tube through the line. Smith says installers then circulated 180°F (82°C) water through the tube to cure the resin into a crosslinked solid -- encapsulating the felt material. The result is a seamless "pipe-within-a-pipe" with a smooth inner surface for increased flow capacity when compared to the corroded concrete.

"One of the keys to making an Insituform installation work is to get just the right processing characteristics from the resin time after time," says Smith. "Working in the desert heat puts special demands on the resin, so AOC formulated the Vipel isopolyester for optimum processing in the environment here. Working with Perris Plant Manager John Mulrine and Project Manager Craig Smarker, we were able to get a resin that consistently met our targets for pot life, viscosity and gel time.

"Just as important was the critical logistical requirement that huge shipments be delivered on a just-in-time basis," Smith adds. "For every shipment, AOC was up to the task. We were able to keep the projects moving without delay."

Mulrine says, "We got our carriers very involved to ensure there were no delays from the time the resin was manufactured to the time it was needed on the job. Sales Coordinators Sharon Gadley and Teresa Belcher-Godbehere at the Perris Plant closely coordinated and tracked the orders, manufacturing schedules and shipments every step of the way."

About Insituform

With headquarters in Chesterfield, MO, USA, Insituform Technologies, Inc., is a leading worldwide provider of proprietary technologies and services for rehabilitating sewer, water, and other underground piping systems without digging and disruption. For more information about Insituform and its products, phone (800) 234-2992 or go to www.insituform.com on the Internet.

About AOC

AOC is a leading global supplier of resins, gelcoats, colorants, additives and synergistic systems for composites and cast polymers. AOC knows technology, lives quality and delivers service better than any other supplier. For more information, e-mail CIPP@aoc-resins.com, phone (901) 854-2800 or go to AOC-RESINS.com.

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