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# CASE HISTORY



## CIPP stops the leaking

<b>Market Segment:</b>	Sewer Rehabilitation
<b>Composite Application:</b>	CIPP liner for vitrified clay pipe
<b>Resin:</b>	Vipel® isophthalic polyester
<b>Manufacturing Process:</b>	Cured-in-place-pipe
<b>Diameter:</b>	8 and 12 inches (20.3 and 30.5 centimeters)
<b>Total Length:</b>	3,050 feet (930 meters)
<b>Infiltration/inflow reduction:</b>	0.5 million gallons/day (1.9 million liters)
<b>Installed:</b>	2004-2005
<b>Location:</b>	Graettinger, IA, USA

The Graettinger, Iowa, website includes the tagline: “Small Town, Big Heart.” The decision to reline old clay sewers with new cured-in-place pipe (CIPP) shows Graettinger is also a small town that knows how to tackle a big problem.

The problem was “infiltration and inflow” or I/I, which means storm and ground water was entering the municipal wastewater system. During periods of wet weather, the water table rose above the level of the sewer pipe system which was leaking at its joints. The result sent extra water through a wastewater system that was designed to collect, pump and treat much lower volumes.

The solution is a new CIPP liner installed by Visu-Sewer Clean and Seal using Vipel® isophthalic polyester resin from AOC, the North American leader in corrosion-



*With trenchless CIPP upgrading the sewers underground, the Southern charm on Collierville streets was not impacted.*

resistant resins. With the new liner sealing old leaks, I/I during rainy periods is reduced by up to a half million gallons (1.9 million liters) per day. That translates into almost 350 gallons (1,325 liters) per minute - an astonishing improvement for any size municipality. “I didn’t believe the numbers at first,” said Graettinger tility Superintendent Paul Kroenke. “I kept checking and re-checking, but the results kept coming up great.”

The substantial I/I reduction allows Graettinger’s wastewater holding lagoons to operate within their designed capacity. As a result, the city does not need a variance to maintain its operating permit with the Iowa Department of Natural Resources (DNR).

Keeping the lagoons within capacity also keeps DNR from designating Graettinger’s sewer system as “continuous discharge.” Having that status would have significantly increased the cost of monitoring and reporting.

### The old technology leaks

The dramatic improvement followed a dramatic problem caused by leaking joints. “I don’t mean every other

## CIPP stops the leaking, continued

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joint leaked,” Kroenke pointed out. “I mean every single one. That pipe was installed by WPA [Work Progress Administration] workers who were not used to working in a deep trench while fighting water.”

Each joint was manually packed with hemp or rope after the spigot at the end of one pipe was inserted into the bell of another. The rope packing lacked the sealing performance of a true gasket and was often poorly installed. Offset joints - where the spigot rests on the bottom of the bell - were very common invitations for serious leaking.

The problem was multiplied by the large number of joints involved. Because of bake oven limitations in the 1930s, individual pieces of clay pipe delivered to Graettinger were only 2-1/2 to 3 feet (76 to 91 centimeters) long.

The improved Graettinger system was designed by the engineering firm DeWild Grant Reckert & Associates Co. (DGR), Rock Rapids, IA. DGR ruled out replacing the old sewers, especially the line buried 20 feet (6 meters) deep in sandy soil under the Main Street business district. Digging a trench would probably cause the entire street to be lost.

### The new technology seals

The most viable option was to have Visu-Sewer install a new liner inside the existing pipe. The initial Graettinger CIPP project lined 3,050 feet (930 meters) of 8-inch and 12-inch (20.3- and 30.5-centimeter) diameter vitrified clay pipe over a period of two years.

Visu-Sewer uses National Liner® CIPP technology licensed from National EnviroTech Group. This technology saturates a non-woven polyester felt liner with a corrosion-resistant thermoset resin, then inverts the liner (turns it inside out) through the pipe in need of repair.

The resin for the Graettinger project was a Vipel® isophthalic polyester manufactured by AOC and purchased through distributor CIPPCON, Ponte Vedra Beach, FL. The resin is engineered to provide ease of formulation, predictable handling and user-friendly wetting characteristics. The felt liners for Graettinger were wet-out at the Visu-Sewer facility then shipped to the job site under environmentally-controlled conditions to prevent premature curing.

To speed installation and minimize disruption, access to the host pipe was accomplished through existing manholes. Water was pumped inside the liner to create

pressure that moved the liner forward and against the inner wall of the host pipe.

After the entire length of an individual inversion was complete, the water was heated to initiate the reaction that turned the liquid resin into a thermoset solid. The end-result is a new seamless liner that stops the leaking at the faulty joints.

After the liner was installed, the Visu-Sewer crew used a remote-controlled pneumatic cutter to open access to laterals. Wye connections at the laterals were then reinstated and grouted in place with AV-100 gel grout to form a water-tight seal at the lateral connection.

### About Visu-Sewer

From headquarters in Pewaukee, Wisconsin, and branches in Fridley, Minnesota, and Bridgeview, Illinois, Visu-Sewer Clean & Seal, Inc., offers a wide range of services for sewer inspection, maintenance and rehabilitation throughout the Midwest. For more information, phone (800) 876-8478, e-mail [visu-info@visu-sewer.com](mailto:visu-info@visu-sewer.com) or go to [www.visu-sewer.com](http://www.visu-sewer.com).

### About National Liner

The National Liner® product is a proven, cost-effective trenchless pipeline rehabilitation system based on cured-in-place pipe (CIPP) technology. For more information, contact Ray Pavlic of National EnviroTech Group, LLC, in Houston, Texas. Phone: 800-547-1235; e-mail: [info@nationalliner.com](mailto:info@nationalliner.com); web site: [www.nationalliner.com](http://www.nationalliner.com).

### 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](mailto:CIPP@aoc-resins.com), phone (901) 854-2800 or go to [AOC-RESINS.com](http://AOC-RESINS.com).