

# CaseHistory

## Styrene-free CIPP for Toronto

<b>Resins:</b>	EcoTek® L040-TNVG-33 Styrene-free vinyl ester
<b>Application:</b>	Cured-in-place pipe
<b>Host:</b>	Storm water pipe and culvert Corrugated steel
<b>Length:</b>	700 feet (200 meters)
<b>Diameter:</b>	30, 36 and 48 inches (762, 914 and 1,219 millimeters)
<b>Installed:</b>	2011
<b>Location:</b>	Toronto, Ontario, Canada

Nationally recognized in Canada for environmental leadership, the City of Toronto has taken its greenness underground by specifying a more Earth-friendly material for storm sewer rehabilitation.

Under the direction of Toronto Water's Senior Engineer Kamran Sarrami, P. Eng., a sensitive rehabilitation project with respect to timing and location had new cured-in-place pipe (CIPP) installed inside old corrugated steel pipe. By eliminating the need to excavate, CIPP was the lowest cost, much less disruptive to the public and businesses in the area, and much friendlier to the environment.

The environmental advantage increased when installer Capital Sewer Services Inc. used new EcoTek®



The rehabilitated pipe and culvert carry storm water through a golf course.



Access matting helped workers reach the job site and protected the terrain during repair.



Capital Sewer Services used an EcoTek styrene-free resin for its ultra low VOC content.

## Styrene-free CIPP for Toronto, continued



Host pipe was up to 48 inches (1,219 millimeters) in diameter.



A new liner emerges during the inversion process through a culvert.

L040-TNVG-33 vinyl ester resin from AOC. Unlike conventional CIPP resins, EcoTek L040-TNVG-33 uses proprietary, styrene-free monomer chemistry with ultra-low volatile organic compound (VOC) content.

“We continually seek leading-edge technologies to turn problems into solutions,” said Capital Sewer Vice President Brian Ratchford. “The EcoTek resin was part of a pilot program with the City of Toronto to reduce VOC emissions. New Canadian regulations for lower VOC limits are on the horizon. This experience puts the City and Capital Sewer ahead of the game for tomorrow’s mandate while providing an environmental benefit today.”

The project rehabilitated approximately 700 feet (200 meters) of sewer line and culverts that carry storm water through a golf course into Don River. The river drains into Lake Ontario, Toronto’s only source of drinking water. Host pipe diameters were 30, 36 and 48 inches (762, 914 and 1,219 millimeters). A pipe failure in the 30-inch section led to flooding of an apartment building and the golf course. A spot dig and further CCTV inspection revealed that all pipe sections were showing signs of rust and decay that caused leaking and threatened pipe integrity.

### The CIPP process

Capital Sewer used the EcoTek resin to impregnate non-woven polyester felt tubes supplied by National Liner LLC, Houston TX, USA. The felt products were impregnated at Capital Sewer’s facility where the resin’s styrene-free technology resulted in lower VOC workplace emissions. The impregnated tubes were shipped to job sites in refrigerated trucks to prevent premature resin cure.

During installation, interior water pressure advanced the tubing forward as it was inverted through the host pipe. When an insertion of predetermined length was achieved, hot water or steam was introduced. The heat initiated the chemical reaction that cured the liquid resin into a molecularly crosslinked solid polymer. The result inside the host pipe was a new, seamless, conforming liner with excellent durability and corrosion resistance.

### Natural transition to EcoTek

To facilitate the transition to styrene-free technology, AOC scientists developed EcoTek L040 resin to process like conventional materials, which use styrene as a diluent to optimize resin viscosity. “The handling and processing characteristics of EcoTek L040 resin are identical to those of resins we have always used,” Ratchford pointed out.

## Styrene-free CIPP for Toronto, continued

“We get the same workability, the same wetting, the same pot life, and the same or better physical properties.

“And because the resin is from AOC, we get the same excellent delivery, service and technical support,” he added. “Sales Representative Steve Maybee and CIPP Product Leader Bill Moore helped us reach this milestone and were on site for our first styrene-free resin installation.”

### **About Capital Sewer Services Inc.**

Formed in 1998, Capital Sewer Services Inc. has become recognized as a major force in the field of pipeline maintenance, inspection and reconstruction. Headquartered in Hamilton, Ontario, Capital Sewer is one of the largest municipal, commercial and industrial service providers in Canada. For more information, phone (905) 522-0522, e-mail [pipeservices@capitalsewer.com](mailto:pipeservices@capitalsewer.com) or go to [www.capitalsewer.com](http://www.capitalsewer.com).

### **About AOC**

For cured-in-place pipe (CIPP), AOC offers resins that process smoothly and perform impeccably time after time. AOC knows technology, lives quality and delivers service better than any other resin supplier. For more information, phone CIPP Product Leader Bill Moore at (901) 854-7291, e-mail [wmoore@aoc-resins.com](mailto:wmoore@aoc-resins.com), or go to [www.cippresins.com](http://www.cippresins.com).

