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Paper Title

“The American Evolution of Cured-in-Place Pipe from Small Difficult Specialty Projects to Being the Technology of Choice for Many Very Large Sewer Renewal Projects”

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Abstract

Since the early 1980s the Cured-In-Place-Pipe (CIPP) technology has grown from being specified primarily for difficult and unusual sewer applications to becoming the technology of choice for large local and regional sewer renewal projects. The paper will discuss how the technology has progressed over the last 25 years in the United States including how changes and improvements have influenced the use of the technology. Information will be presented on what still needs to be done and how the product quality and testing are envisioned for the future of the CIPP technology.

INTRODUCTION

Cured-in-place pipe (CIPP) was first installed in the early 1970^s in Europe. In the late 1970^s or early 1980^s the technology took root in the United States. The U.S. market has evolved into possibly the largest market for trenchless technology in the world. In the early, 1980^s, CIPP installations were embraced as the best technology solution for the renewal of the Nations sewer infrastructure and that the technology would revolutionize the industry very quickly. In reality it took until the late 1980^s and early 1990^s before municipalities and engineers were thoroughly convinced that the CIPP technology was truly a major innovation and that it would totally change the way the industry renewed its sewer pipeline infrastructure.

Since the 1990^s the CIPP industry grew significantly, where today over a billion dollars is being spent, each year, on sewer rehabilitation, renewal, reconstruction etc. throughout the United States using the CIPP technology.

The CIPP technology delivery however has evolved from fully integrated quality systems to off the shelf, low quality, commodity type products that through cut-throat competitive low bidding has driven prices for CIPP technology to an all-time low.

CURRENT INDUSTRY EXPENDITURES

The Environmental Protection Agency (EPA) has estimated the United States alone needs to spend \$388 billion dollars over the next twenty (20) years to effectively restore sewer pipe infrastructure that has outlived its useful life and needs to be replaced or rehabilitated. This equates to over 19.4 billion dollars each year for over 20 years, that needs to be expended and only a little more than 4.1 billion is actually being spent. Of this amount expended approximately 1.2 billion dollars is being spent using CIPP type technology.

A realistic estimate for pipeline renovation in the foreseeable future, in the U.S., will be closer to \$5 Billion per year. Expenditures for CIPP should therefore increase to between 1.5 and 2 billion per year.

When CIPP was first introduced, to the U.S. market, in the early 1980's a typical lining project would have consisted of several hundred to several thousand feet of liner per project. However, since that time customers have accepted CIPP technology as the best and most cost effective method for both proactive and reactive pipeline renewal. Installation efficiencies and improved impregnation procedures have contributed significantly to the speed at which liners are installed resulting in larger projects offered for renewal. The low quality and low price commodity market CIPP product however, is raising questions by the customers on what quality and product longevity they are really getting for the price paid.

Single contracts today can range in quantity from several thousand feet in length to over 80,000 feet in length.

Some key issues that have contributed to product acceptance and the expansion of the CIPP market include:

- Customer acceptance of the CIPP technology through extensive education, trade shows events, field demonstration projects, and successful product installation history.
- Faster and more economical product development and installation techniques in the field. Length of 2000-2500 feet in one continuous installation. Several years ago a large project (65,000 feet of 48", 54" & 60") along the Charles River in Boston, was completed successfully by installing sections of 2500 feet of liner in one continuous installation.
- Federal government (EPA) "Consent Decrees" whereby cities must eliminate Combined Sewer Overflows (CSO's) and Sewer System Overflows (SSO's) within a specified time period or face significant fines. These EPA decrees give the city the political reason to spend large sums

of money for sewer renewal which otherwise may have been spent on other city programs.

- Development of a common sewer pipe defect identification program (PACP) that allows customers to identify pipelines needing immediate renewal attention and tracking the continued deterioration of their systems over time. The development of the Pipeline Assessment Certification Program (PACP), developed by NASSCO, in cooperation with the Water Research center (WRc) in England in 2001 customers now have a common way to identify sewer line defects and be able to rate the deficiency of their systems. This data then allowed the customer to proactively plan for sewer renewal projects.
- Many cities have taken the proactive approach and follow the theory

“If It Ain’t Broke, Fix It Anyway”¹

These cities have determined that it is significantly less expensive to renew their existing pipelines before a high cost emergency collapse occurs.

- Cities are approving long term multi year CIPP contract which can be renewed annually for three (3) years or in some cases longer. This allows for better planning of resources both for the city and the contractor. Many States can directly award work to contractors that have a current publicly bid contract with another city. The city accepts and the contractor agrees to perform the work at the same unit prices and in accordance with the signed legal documents from the other city.

THE FUTURE OF THE CIPP INDUSTRY IN THE U.S.

The future of the CIPP industry in the U.S. will continue to grow. New, higher quality lining technologies such as Ultra Violet Light systems, improvements in resin quality and characteristics.

Future events that will further grow the CIPP technology in the U.S.

- Plans are being developed, by a major university, to launch a public infrastructure awareness program to be aired on public television.
- Plans are in progress to develop national quality standards for CIPP liner. Customers will be able to verify and test their entire CIPP installation.
- After much attention has been put on mainline sewer renewal over the last 25 years, service connection renewal is getting greater attention and will grow in the U.S. in the future.

- Many cities that are under EPA Consent Decrees are planning multi-year renewal programs which can range from several years to over 10 years in duration.

Based on industry research, in the years 2005 and 2006 CIPP lining was used more than any other technology for repair/replacement of old pipelines.²

An example of several large projects include:

- Citywide Concrete Sewer Rehabilitation Program – City of South Gate, California. The project was completed by one contractor and included approximately 400,000 linear feet 8, 10, 12, 15, 18, 21 and 24 inch diameter CIPP lining of concrete sewer pipe.
- Harris County Municipal Utility District 10 – Harris County Texas. The project consists of lining 16,000 linear feet of 8, 10, and 15 inch truss pipe with CIPP.
- Lafayette, Louisiana – 17,500 linear feet of CIPP Liner installed in 2005 with similar size project in 2006.
- City of Atlanta – plans to review and renew nearly 2200 miles of pipe at a cost of over \$1.2 billion.

1. Municipal Sewer & Water Magazine, by Angus W. Stocking

2. Sewer Rehab Trends by Samik Ghosh Trenchless Technology October 2006