CIPP Then and Now

CIPP Then

Presented by:
Lynn Osborn P.E.

Introduction

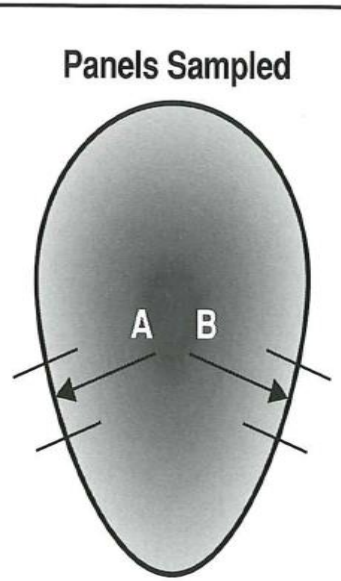
- From its first installation in 1971, in the UK, the CIPP technology, and associated products, has revolutionized how we manage the maintenance and replacement of one of the worlds most important infrastructure! the aging underground water and wastewater pipelines.
- The CIPP Technology has replaced more costly and disruptive excavation with more environmentally friendly and cost saving rehabilitation of failing water and wastewater facilities.

Eric Wood The Inventor and Legend

- In 1970 -Eric Wood
  - Operated out of the UK
- Formulates the idea of CIPP
  - Partnered with Brian Chandler
  - Formed Insituform® Group Limited
  - Sold licenses globally
  - **Started an Industry**
- Remained innovative throughout his life, working on improving CIPP

First Installation

- 1971 demo in London Borough of Hackney
- 46” x 24” egg-shaped sewer
- Tube pulled-in, hot air cure
- Tested many times in 50 years; performing well
- Still in service today



Length	=	230 ft.
Size	=	3 ft.10 in. x 2 ft.
Contents	=	Industrial and domestic effluent
Location	=	London Borough of Hackney
Client	=	Thames Water
Installed	=	1971
Sampled	=	June 1991

First Operating Company

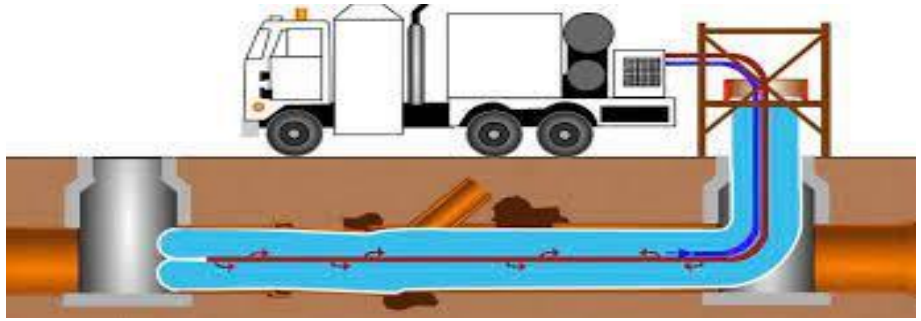
- Insituform® Pipes and Structures Ltd
- Operated out of the UK
- Began making product improvements

Large Diameter Project Completed

- 108” in diameter in 1972
- Manufactured tube on site & applied resin
- Pulled into existing pipeline
- Inflated & pressurized with air
- Ambient cured

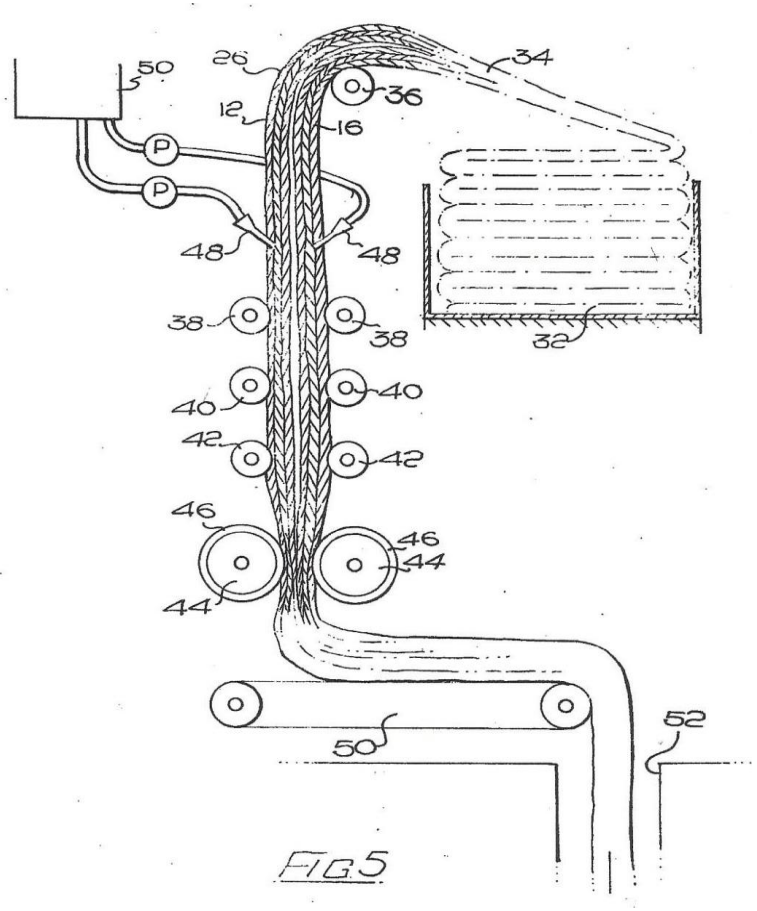
Introduction to North America

- CIPP came to NA in the mid-1970s
- Underground Surveys (Licensed from UK)
  - Fresno, CA
  - First installation a 12” sewer in Fresno in 1976
  - Developed one of the first robotic cutters for opening service connections
- Other UK licensees formed: Insituform East, Great Lakes & Canada



U.S Patents Issued to Insituform®

- Patents for the technology were issued to Insituform in 1976 and1977

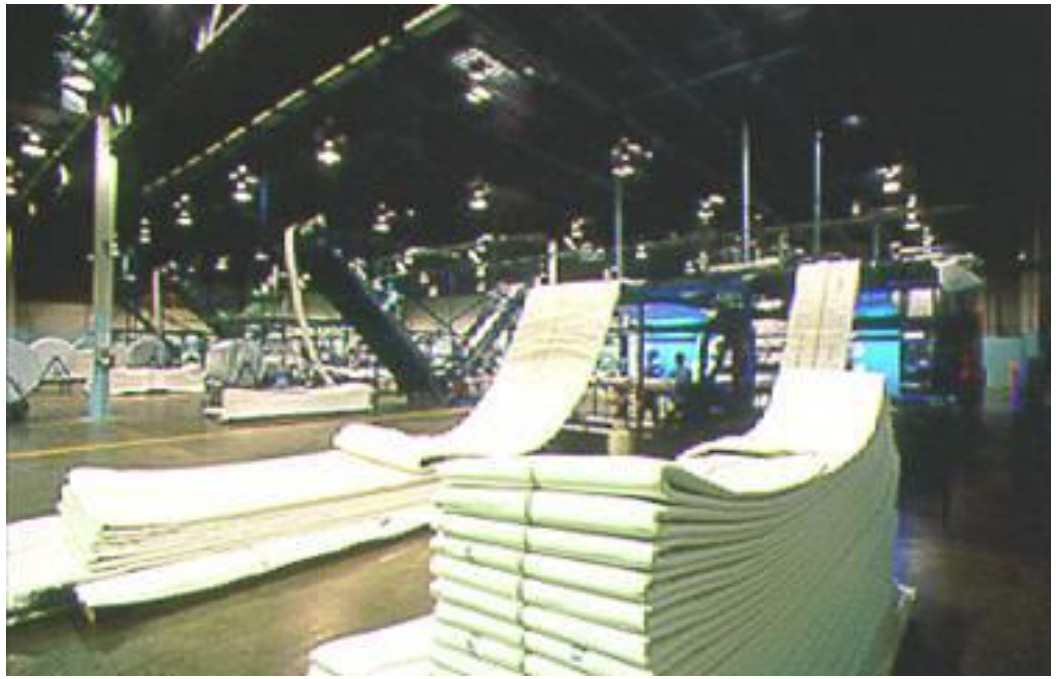


Insituform® of North America

Formed in 1980 in Memphis

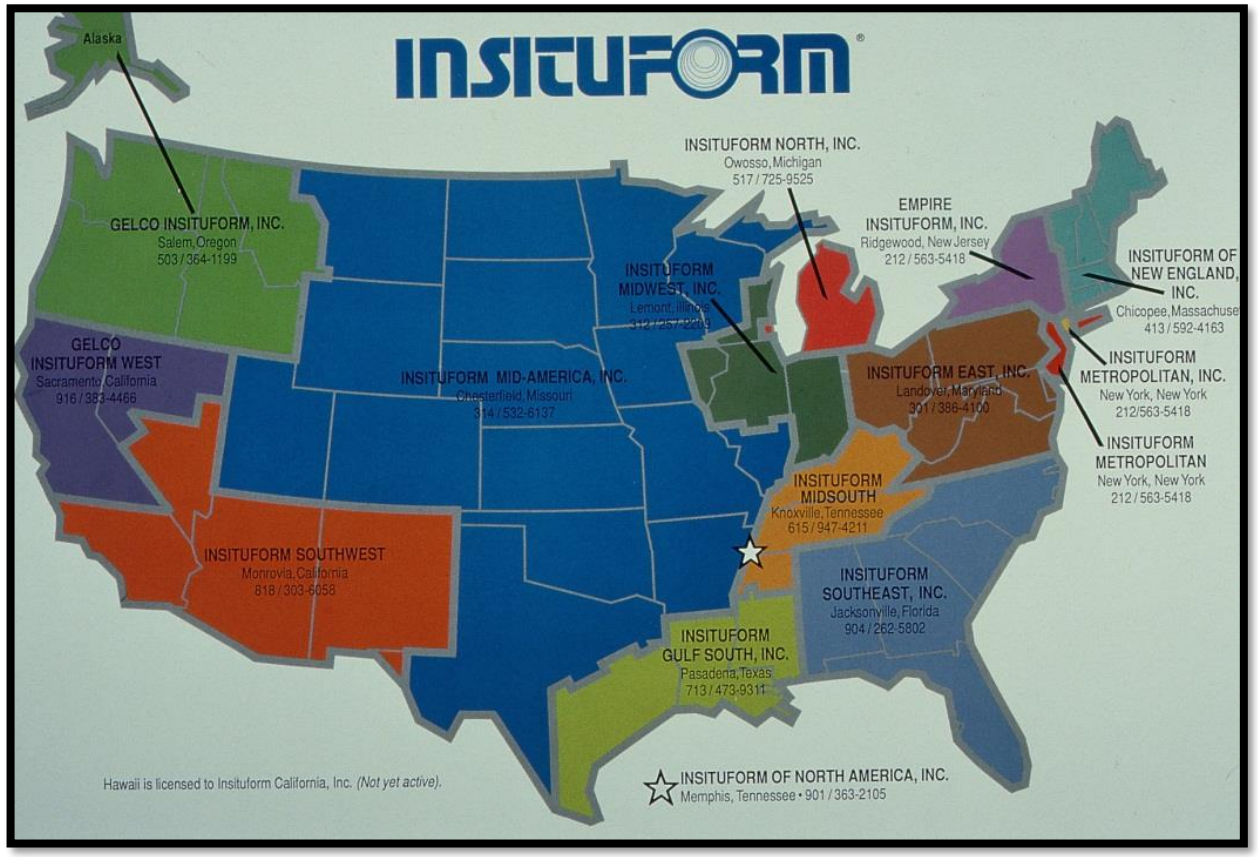
Licensed contractors for exclusive territories

Opened first manufacturing plant in 1982



Licensee Network

- Eventually covered all of the US and later Canada



First Onsight, Over-the-Hole Wet Out

- 30 mm design thickness
- Wet out & curing challenges
- Innovative installation with issues
- 500 feet of 63” sewer
- Detroit, MI, June 1984
- Resin delivered in 55 gallon drums

Major Pipeline Infrastructure Collapse

- Landmark project in St Louis in 1987
- 96-inch pipeline collapses under weight of beer truck
- Involved large quantities of beer
- Largest CIPP project to date

CIPP Tube Availability Increased

- Major tube manufacturing facility was opened in Batesville, MS to serve the U.S. market for the Technology - 1988

Insituform Technologies, Inc. (ITI) Established

- All technology rights obtained from Insituform Group Limited - 1992
- Located in Chesterfield, MO
- Began acquiring all independent licensees
- Long-term plan to acquire Insituform licensees and organize the worldwide network under one corporate umbrella

Insituform Becomes One Corporate Enterprise

Unusual Challenges

- Great Midwest flood of 1993 temporarily shuts down Insituform Mid-America, Insituform's largest licensee
- Two years later, Mid-America and Insituform Technologies merge.

Insituform U.S Seminal Patents Expire - 1994

- Allowing the market to expand
- Similar technologies could be developed
- Allowed competition to grow
- PVC folded pipe was introduced
- HDPE folded pipe introduced earlier in U.S.
- Spiral type liners were being installed

CIPP Begins to Grows Significantly

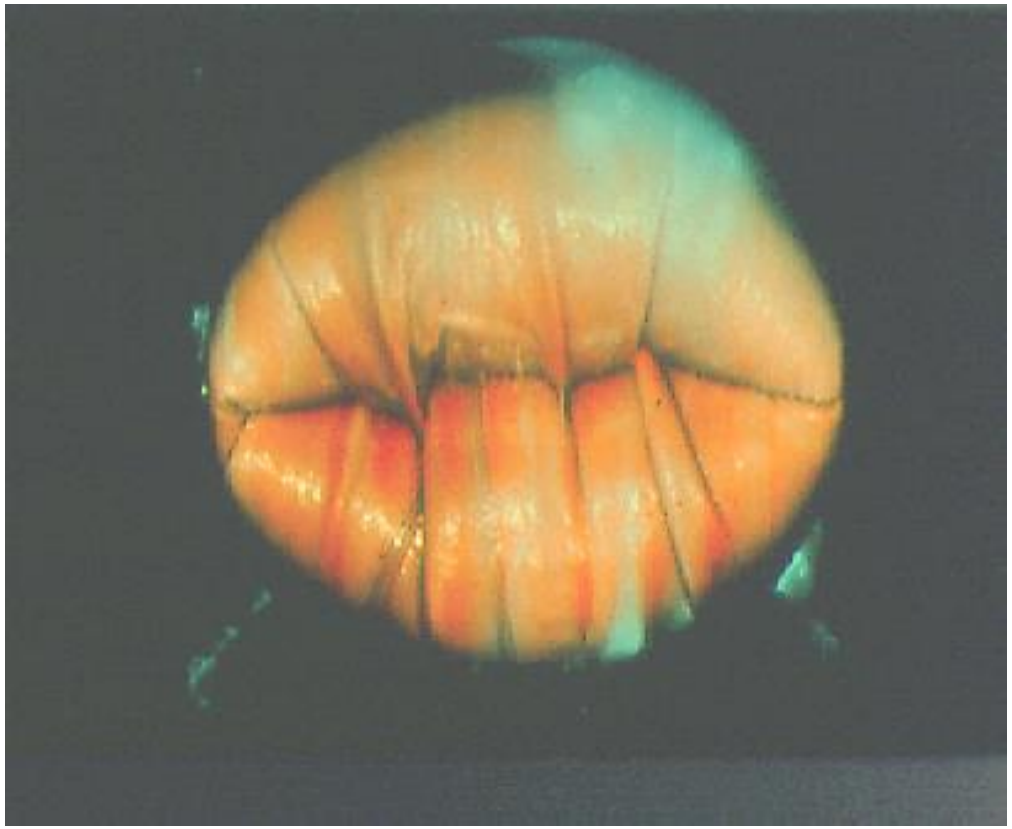
CIPP Now

Presented by:
Gerry Muenchmeyer, P.E.

The Growth of CIPP

- In late 1980s other CIPP companies emerged
- Initially pull-in type installations, because of patent infringements
- More consulting engineers became involved
- Other tube manufactures joined the industry
- In the 1990s key patents expired
- More CIPP companies using inversion & pull-in were started
- CIPP grows into a billion $ plus market worldwide

Multiple Installation Techniques



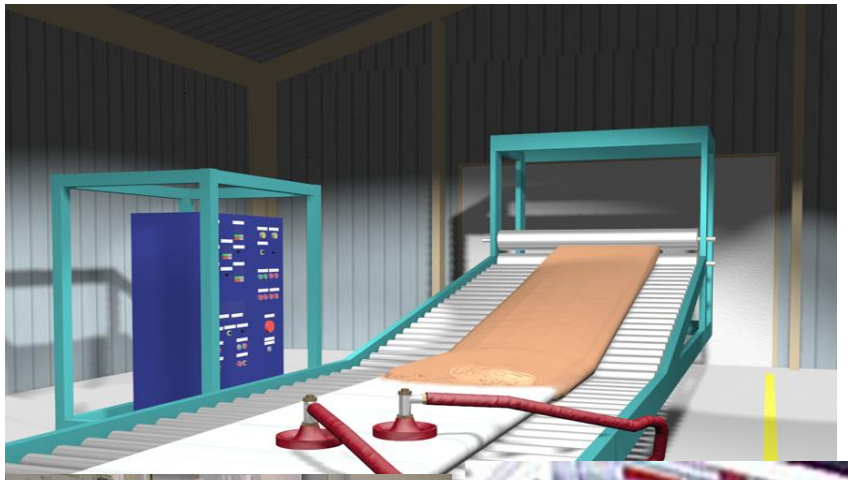
Inversion

Pull-In

Improved Installation Equipment

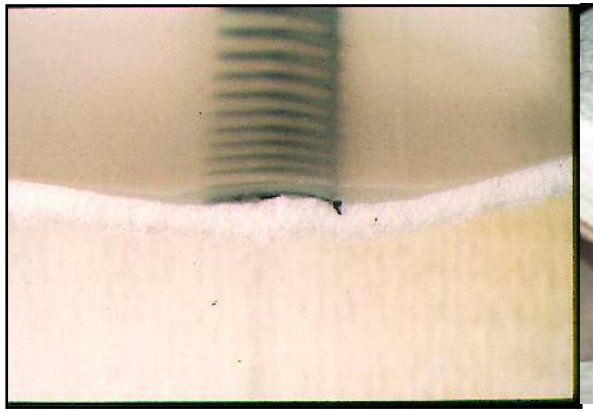
Equipment Improvements

- Static Mixing systems
- Material Handling
- HD Television inspection
- Robotic Cutters

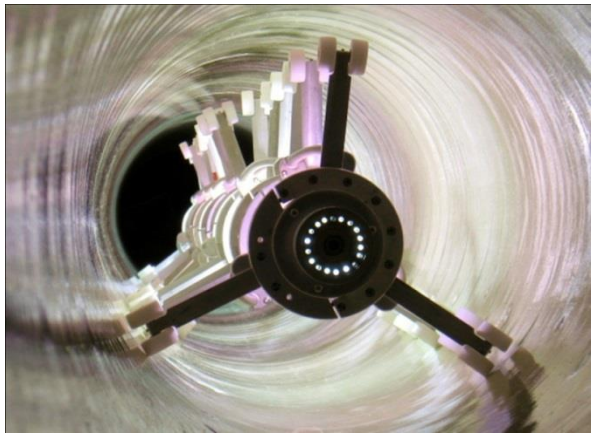


Improved Materials

- Tube manufacturing Techniques
- Improved coating material
- Fiberglass & Carbon reinforcing materials
- Quality resin systems
- More predictable & reliable

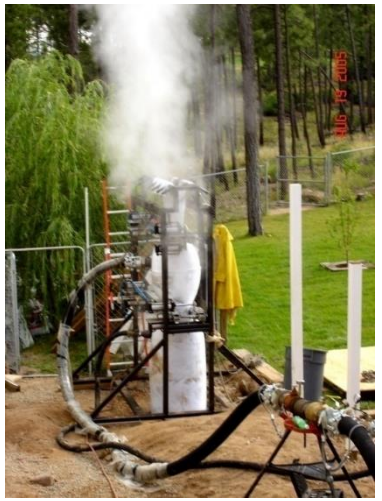


Multiple Curing Techniques



UV Light

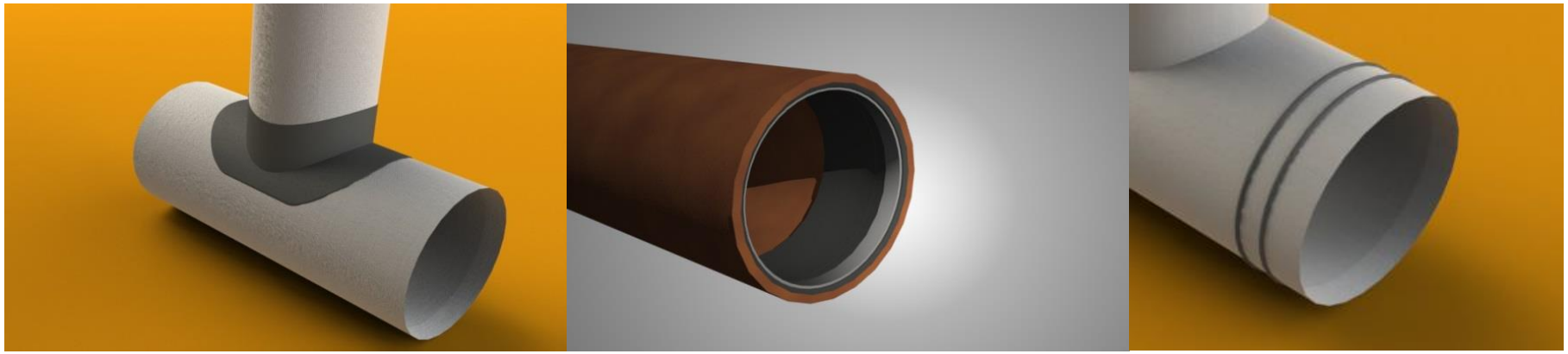
Hot Water

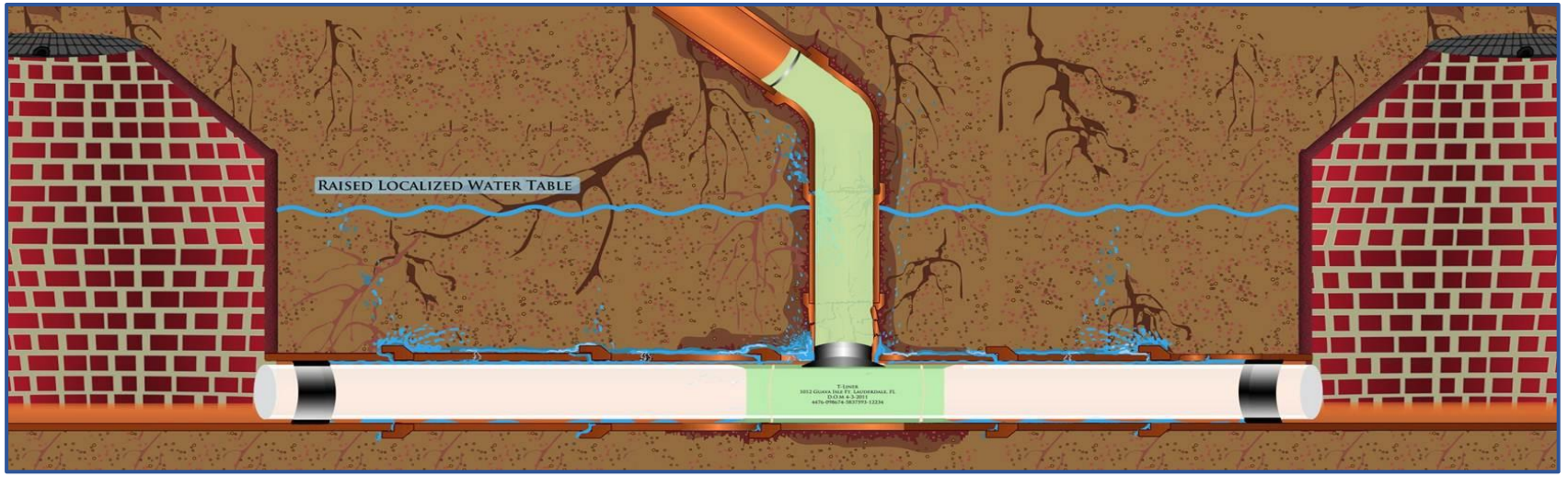


Hot Air/Steam

LED

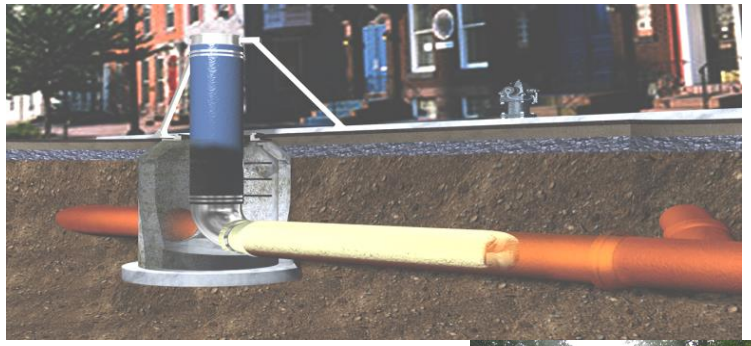
CIPP Leakage Control Techniques

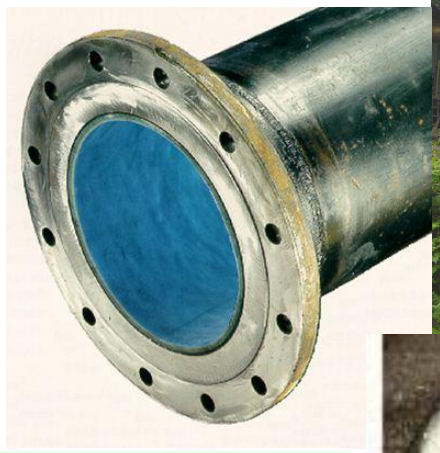




Continued Market Growth

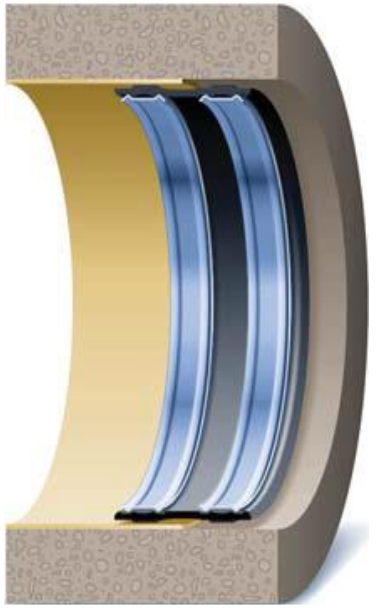
- Mainline Sewers
- Force Mains
- Storm Culverts
- Water pipelines
- Industrial
- Utility
- Lateral pipes
- Manholes





Other Markets Developing

- Pressure pipelines
  - Sewer force mains
  - Gray water systems
  - Potable water
  - End seal techniques
  - Pressure liners
  - Reinforced liners



Experienced Labor

- Educational programs
- Inspector training certifications

NASTT™

NORTH AMERICAN SOCIETY FOR TRENCHLESS TECHNOLOGY

CERTIFIED TRAINER
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Summary of CIPP Technologies Now

- Significant growth in municipal applications
- Commercial, industrial and utility installations became common
- Improved product production and quality
- Standards developed for all aspects of the technology
- Faster installation methods
- Curing methods advanced with LED technologies
- Better equipment developed including high efficiency robotics
- Educational programs embraced by owners and engineers
- Installation testing and inspection programs developed

CIPP Today

- Multi-Billion $ industry and growing
- Many new companies in CIPP business
- Small diameter building pipeline growth

Future for CIPP

- ASCE/UESI Manual of Practice 145 to be introduced at Pipelines 2021
- CIPP Market estimated at $2.6 Billion worldwide by 2026