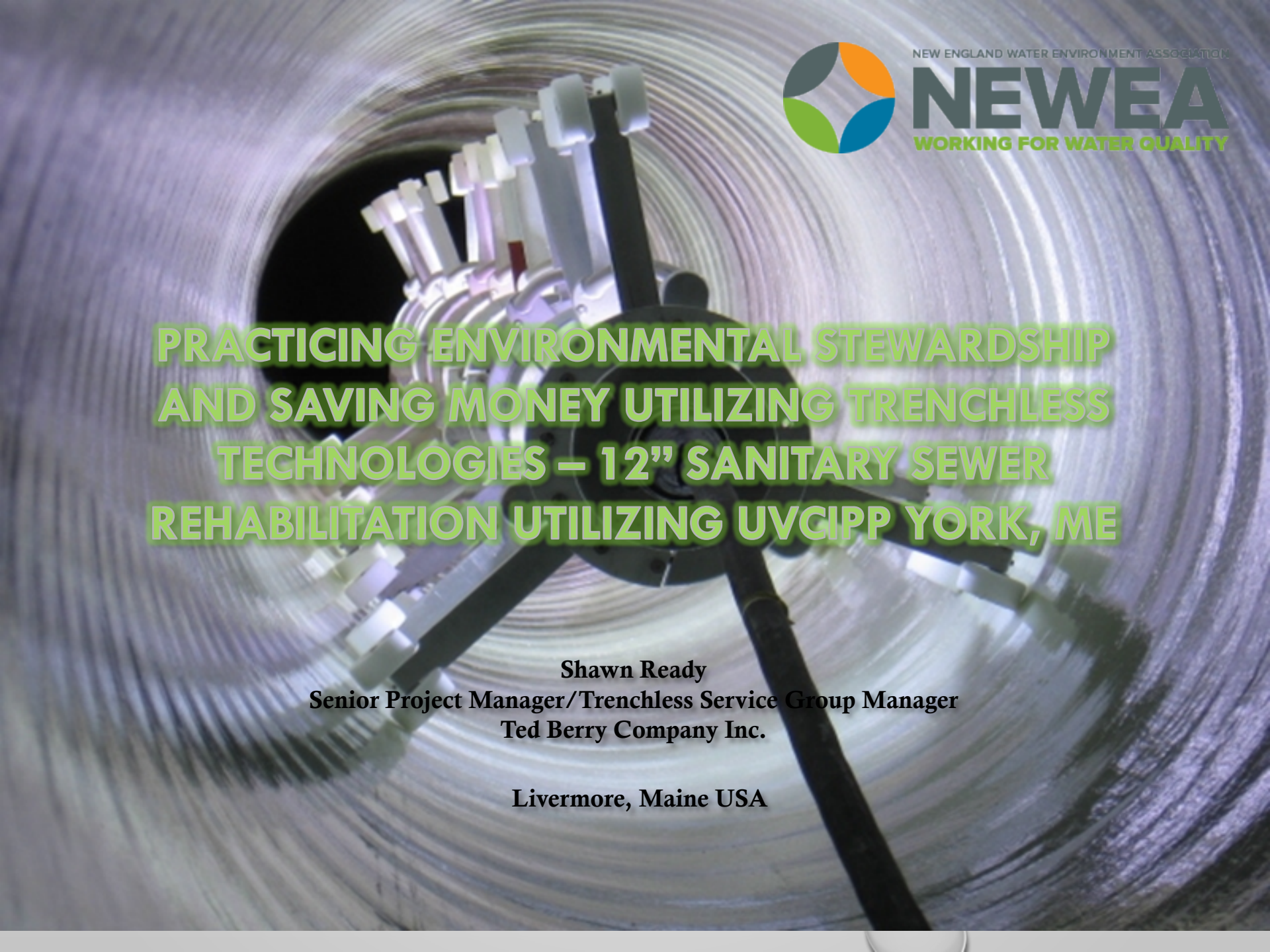


NEW ENGLAND WATER ENVIRONMENT ASSOCIATION
NEWEA
WORKING FOR WATER QUALITY

PRACTICING ENVIRONMENTAL STEWARDSHIP AND SAVING MONEY UTILIZING TRENCHLESS TECHNOLOGIES – 12" SANITARY SEWER REHABILITATION UTILIZING UVCIPP YORK, ME

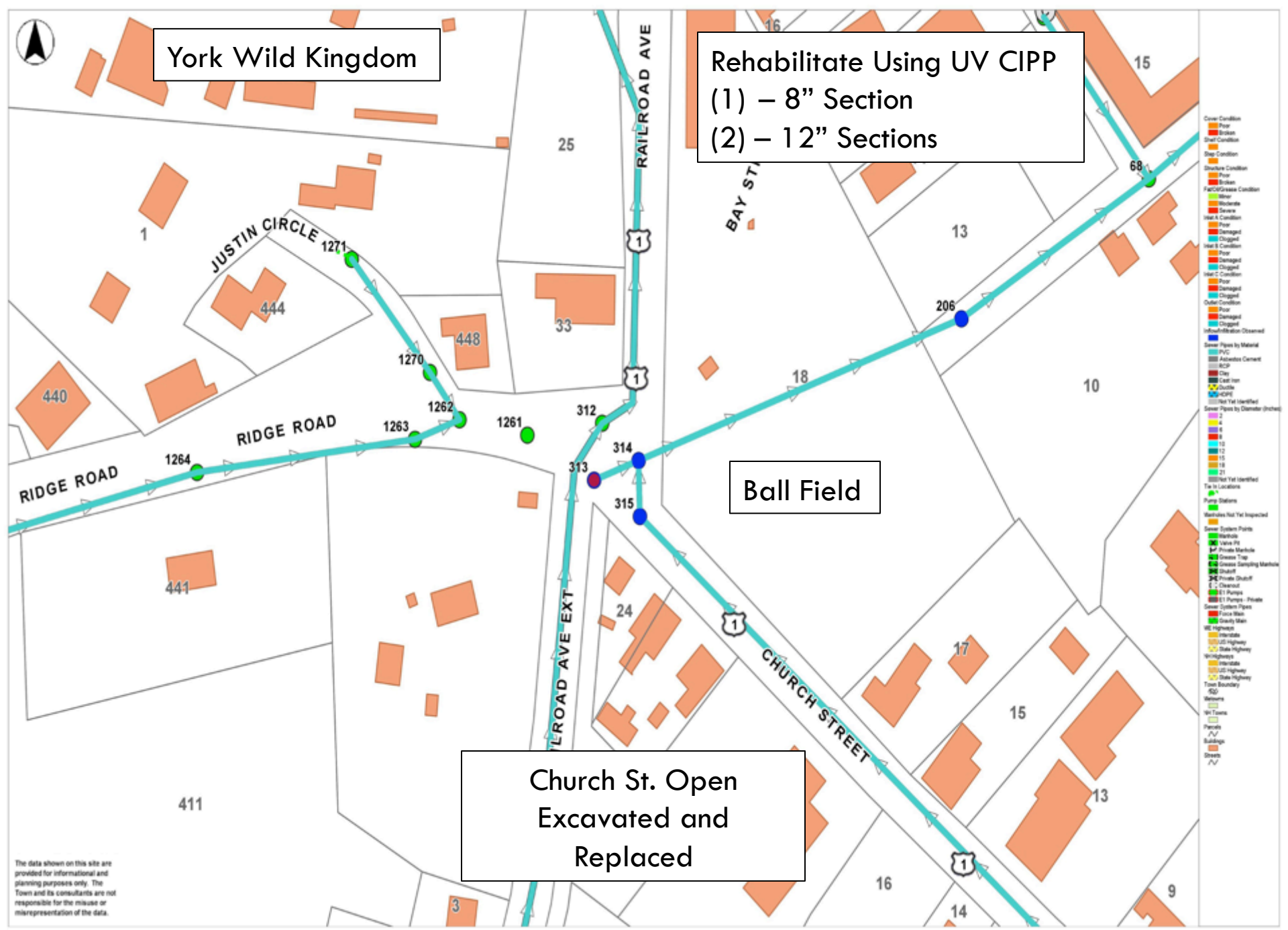
Shawn Ready
Senior Project Manager/Trenchless Service Group Manager
Ted Berry Company Inc.

Livermore, Maine USA

Background

Method Feasibility and Approach Selection -

Method	Advantages	Disadvantages	Comment
Open Cut Excavation	Contractor already awarded on project. Familiar approach predictable budget.	Extensive disruption to intersection and town baseball field in early spring. Future maintenance of ball field.	Not practical solution for section of project crossing Route 1 and Ball Field.
Pipe Bursting	Could replace pipe in place with same or larger pipe and reduce excavation by 90% +-	Would need to excavate pipe insertion pit and short lengths in Route 1 intersection not practical.	Pipe bursting used successfully for YSD on previous projects.
UV CIPP	Could structurally rehabiliate with no digging in a short timeframe with minimal disruption.	No identified disadvantages to approach.	Selected Method of rehabilitation.
Do Nothing	Easy and Cheap.	Would not address heavy infiltration and high flows through	Major utility coordination project focused on the


York Wild Kingdom
Rehabilitate Using UV CIPP
(1) – 8” Section
(2) – 12” Sections
Ball Field
Church St. Open
Excavated and
Replaced
JUSTIN CIRCLE
RIDGE ROAD
RIDGE ROAD
RAILROAD AVE
RAILROAD AVE EXT
CHURCH STREET
BAY ST
1271
1270
1262
1263
1261
1264
312
313
314
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Printed on 11/24/2014 at 10:09 AM
York Sewer District

Church St. Open Cut Replacement

New sewer, water, drain. Relocations and changing elevations and locations.

UV CIPP Active Jobsite lining in progress

Technology Selection

UV CIPP
Method

UV CIPP is an advanced generation of cured in place pipe methodology and materials.

Pipes are structurally rehabilitated with CIPP composite materials and cured using ultraviolet light.

Fully Trenchless

UV CIPP ADDRESSES ISSUES WITH:

GROUNDWATER INFILTRATION

STRUCTURAL PIPE DEFECTS-

CRACKS

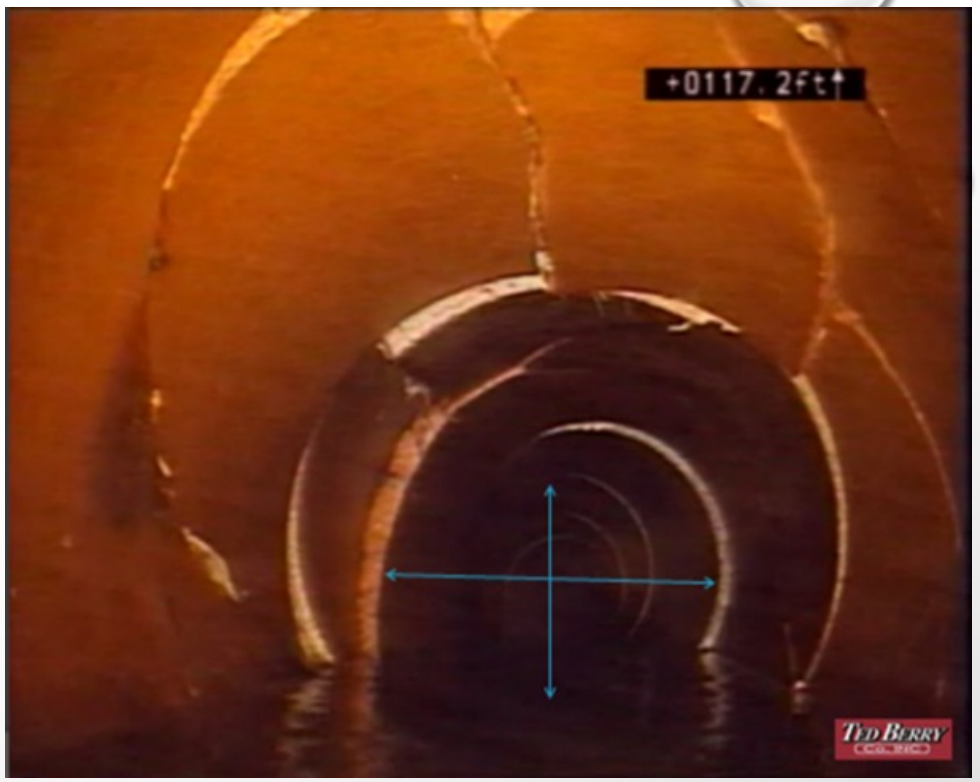
FRACTURES

HOLES

SSO CAUSED BY

DETERIORATING PIPES

ROOT INTRUSION



Technology Envelope	UV CIPP
Diameter Ranges	6” – 54”
Trenchless or Semi-Trenchless Method	Full trenchless method installed through standard manholes
Lengths	Up to 1,000’
Pipe Shapes	Any
Product Life Expectancy	70+ Years
Flat Plate Modulus (ASTM D790)	1,300,000-1,700,000 psi
Installation	Pull in ASTM F2019
Inflation	Air
Use of Pre-Liner	Yes
Liner Inspection before/during cure	Yes by CCTV
Curing Method	Ultraviolet Light (UV)
Releases of Styrene to Environment	NO
Cure Time	Controlled by Quality Tracker System
Uses Quality Control Telemetry	Yes with Quality Tracker Sytem

Design, engineering, and materials specifications

Ability to design for all pipe types and shapes. Able to deliver design submittal showing all aspects of the material design and engineering characteristics using ASCE or ASTM F-1216.

ASCE Pipe Shapes

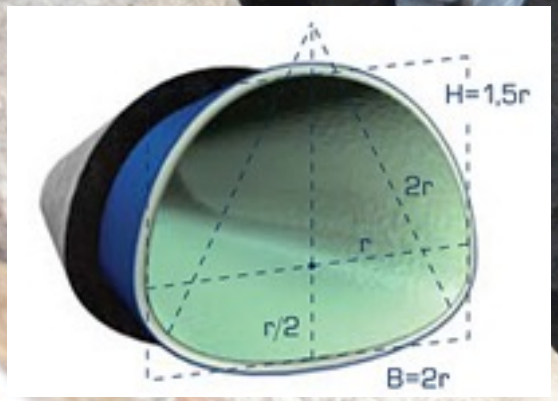
1. Circular
2. Egg
3. Elliptical
4. Pipe Arch

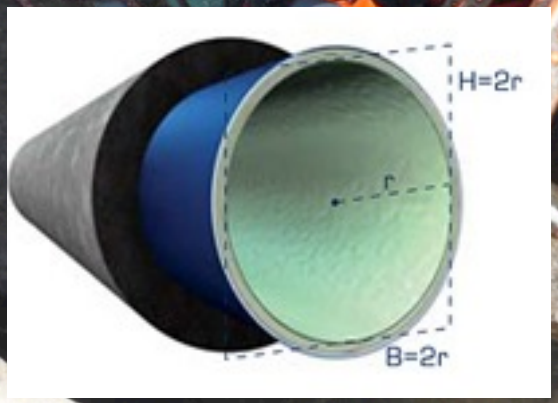
Materials

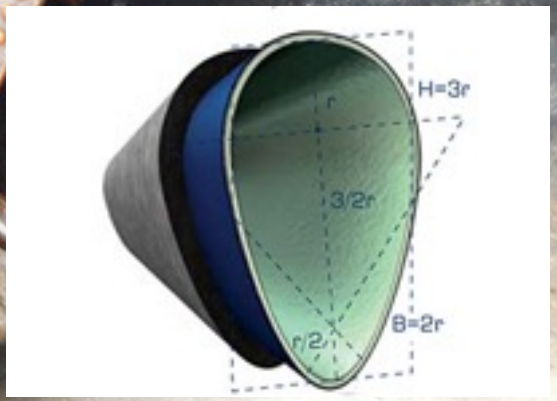
1mm = .03937 inches

Each layer of composite = .7mm

Manning's comparable to PVC

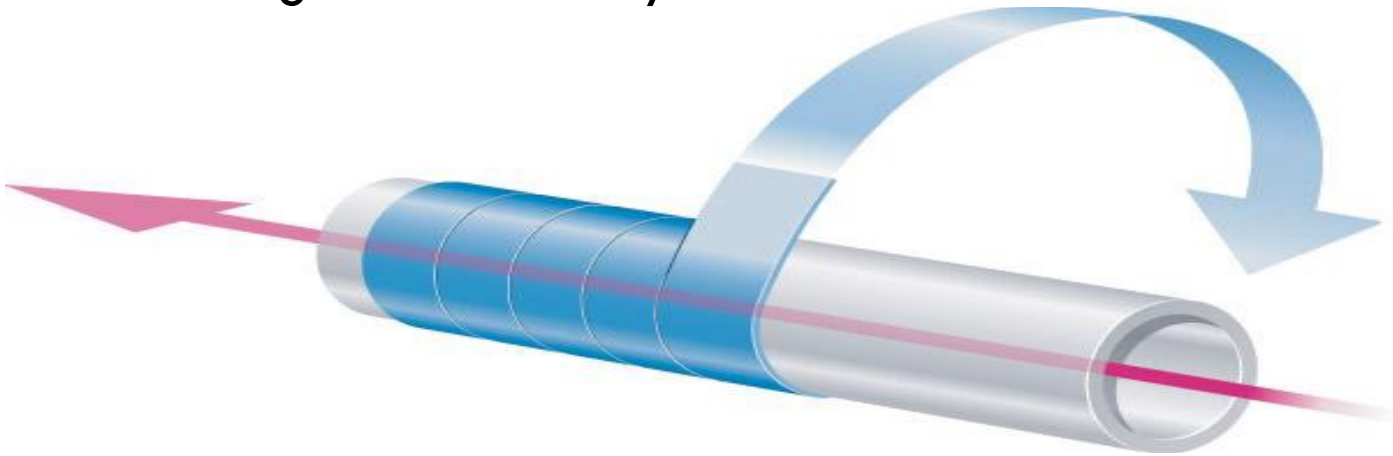


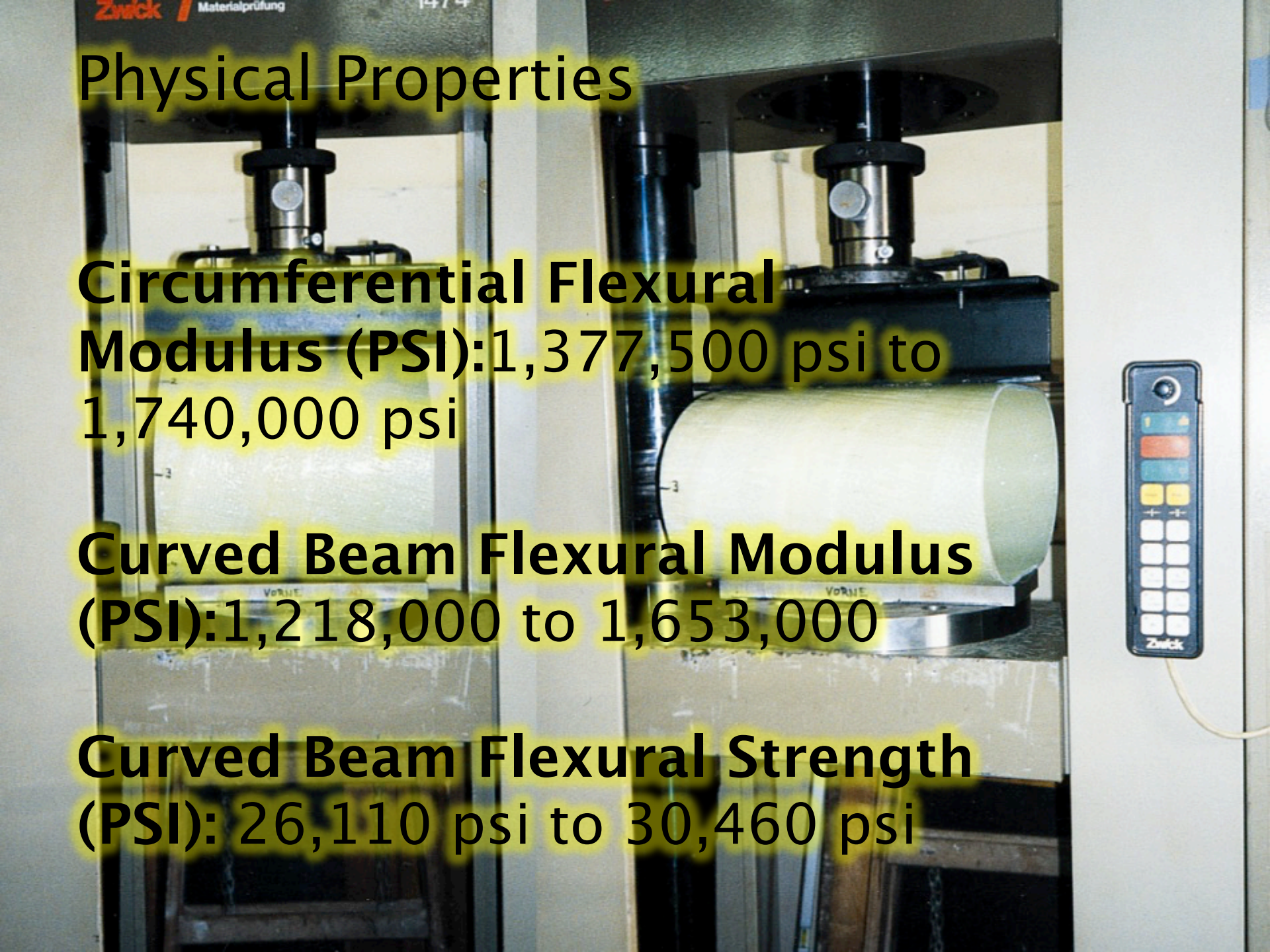




UV CIPP Tube Design – Composite

- Inner Film (removed after installation)
- Multiple spiral-wrapped layers of resin saturated fiberglass; no seams.
- Woven pulling bands
- Outer film
- Protects liner from:
- UV Light
- Offset joints and broken pipe
- Contact with water & other contaminants (impurities)
- Contain resin migration and Styrene





Physical Properties

Circumferential Flexural Modulus (PSI): 1,377,500 psi to 1,740,000 psi

Curved Beam Flexural Modulus (PSI): 1,218,000 to 1,653,000

Curved Beam Flexural Strength (PSI): 26,110 psi to 30,460 psi

UV CURE Truck:

- ✓ 1,000’ Cure Cable
- ✓ UV Light Train – 9x 1,000w
- ✓ 55 kw Generator
- ✓ Curing Controls and CCTV System
- ✓ Climate Controlled Engineer and Owner Station

Blower Truck:

- ✓ High Volume Low Pressure Blower
- ✓ 82 kw Generator
- ✓ Mainline CCTV System

Installation Steps

Clean Existing Pipe

CCTV Inspection

CCTV Inspections completed using PACP defect coding

Installation Steps

Install Slip Sheet

Protects Liner and Outer Film and reduces Drag during pull in.

Liner Material Preparation

Liner material is ambient and does not r
Require special handling, storage* or refrigeration.

Installation Steps

Liner lowered into MH

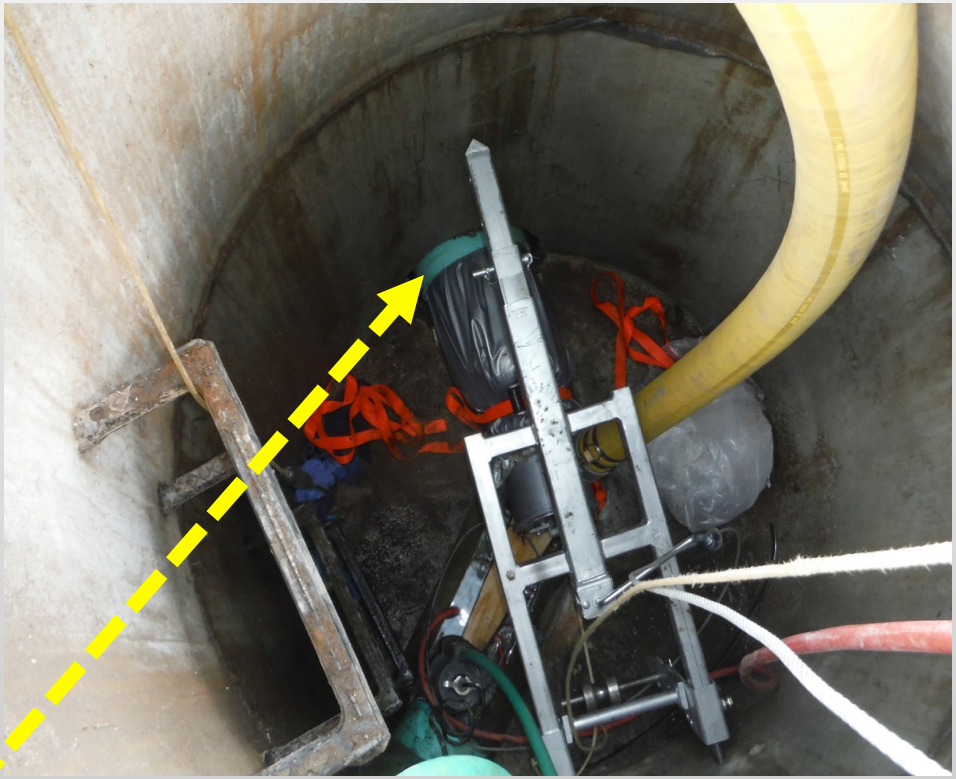
Pulled in place with constant tension winch – No Inversion

Preparation and Testing of UV Light Train – Pre- Cure

Installation Steps

Blower System Controls

Air Packer Installed in inflated liner



Install hydrophilic seal at manhole between host pipe and liner prior to Inflation.

Installation Steps

Removal of Inner Film

Final product termination at MH

Flow isolated, bypassed and returned to service immediately following cure reducing risk from bypass system.

Curing Documentation / Quality Assurance

- The entire cure process is recorded electronically real time during cure.
- Computer documentation includes:
  - A. Initial calibration of the curing equipment
  - B. Lamp intensity & number of lit lamps
  - C. Infrared sensors located inside pipe during cure
  - D. Inner air pressure of the liner
  - E. Curing speed in feet per minute
  - F. Documentation of cure cycle on entire liner
- In addition the customer receives immediate CCTV documentation of every foot of the installed CIPP recorded prior to and during the curing process.

Conclusions

Before: 8:00am April 7th, 2015

After: 3:30pm April 7th, 2015

QUESTIONS

SHAWN READY

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