



UNDERGROUND CONSTRUCTION TECHNOLOGY

THE UNDERGROUND UTILITIES EVENT | JANUARY 25-27, 2022 | FORT WORTH, TEXAS

2021 North Haven Sacket Point Siphon UV CIPP



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Presenters:



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MICHELS®



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General Project Information:

North Haven, CT - Sackett point Rd

Full Replacement of Sackett Point Road Bridge No. 03743
Located over the Quinnipiac River.

Reconstruction and widening of roadway.

During construction, new pylons and bridge footings were to be placed in the river.

Due to the proximity to the new structures, concerns over the integrity of the siphons were made.

Decision reached to clean, inspect, and line siphons.





Condition of the bridge





Scope of Lining Work:

2 – 16-inch x 210-foot siphons.

Clean both 16-inch siphons and prepare for lining.

CIPP Line 2 each 16" siphons.

Bends in excess of 22.5%.

Bends at varying angles.





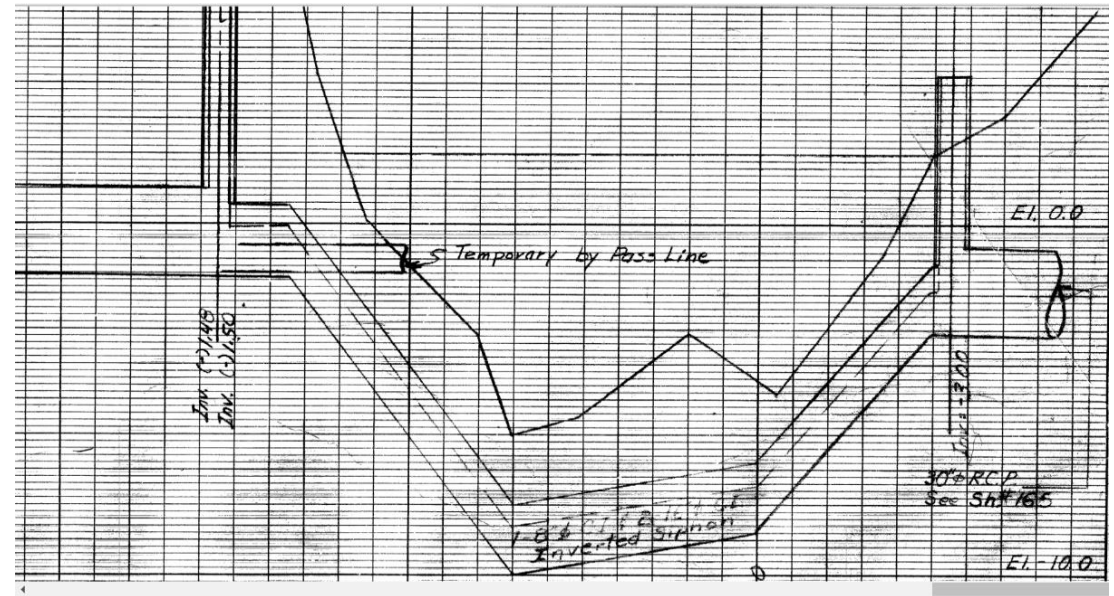
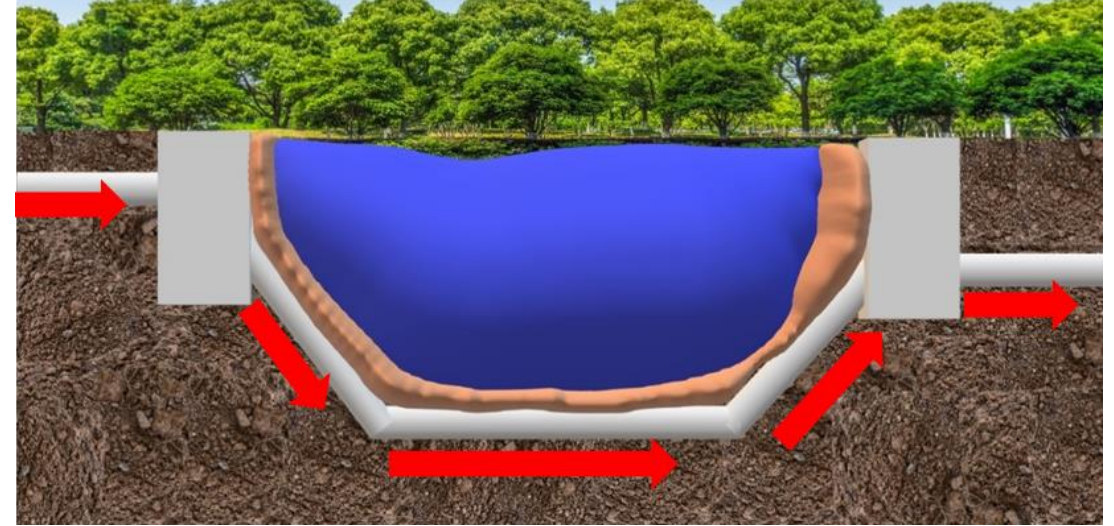
What is an Inverted Siphon?

A pressure pipeline used to carry wastewater flowing in a gravity collection system under a depression.

Conveys water from one location to another without mechanical force.

Water enters at higher elevation and exits at lower elevation.

Uses the influence of gravity and differential pressure to convey water.





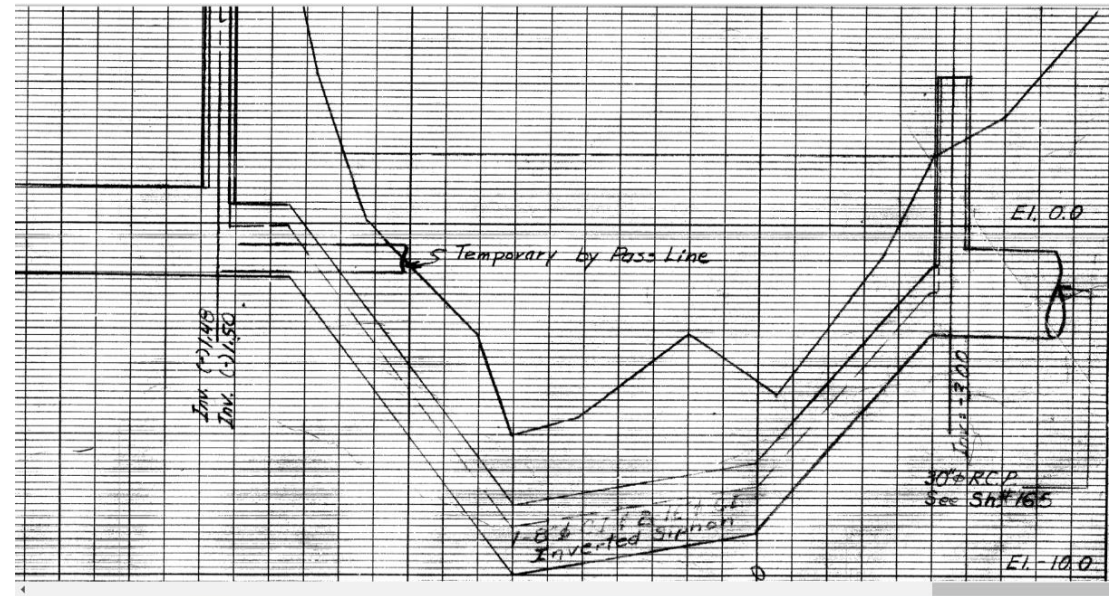
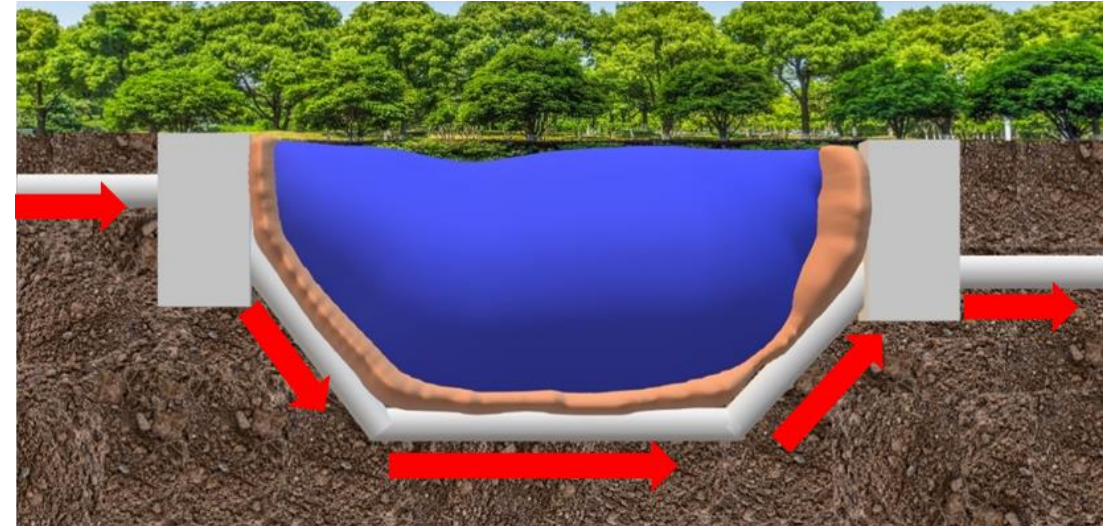
Advantage / Disadvantage of Inverted Siphons

Advantages:

- *Allows for gravity sewer to proceed through areas blocked by utilities, water systems, valleys.
- *No mechanical means necessary, to move fluids.

Disadvantages:

- *Induce additional head loss to the sewer system.
- *Sediment Accumulation problems in lower pipe sections cause easy blockages due to siltation.





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Project Location



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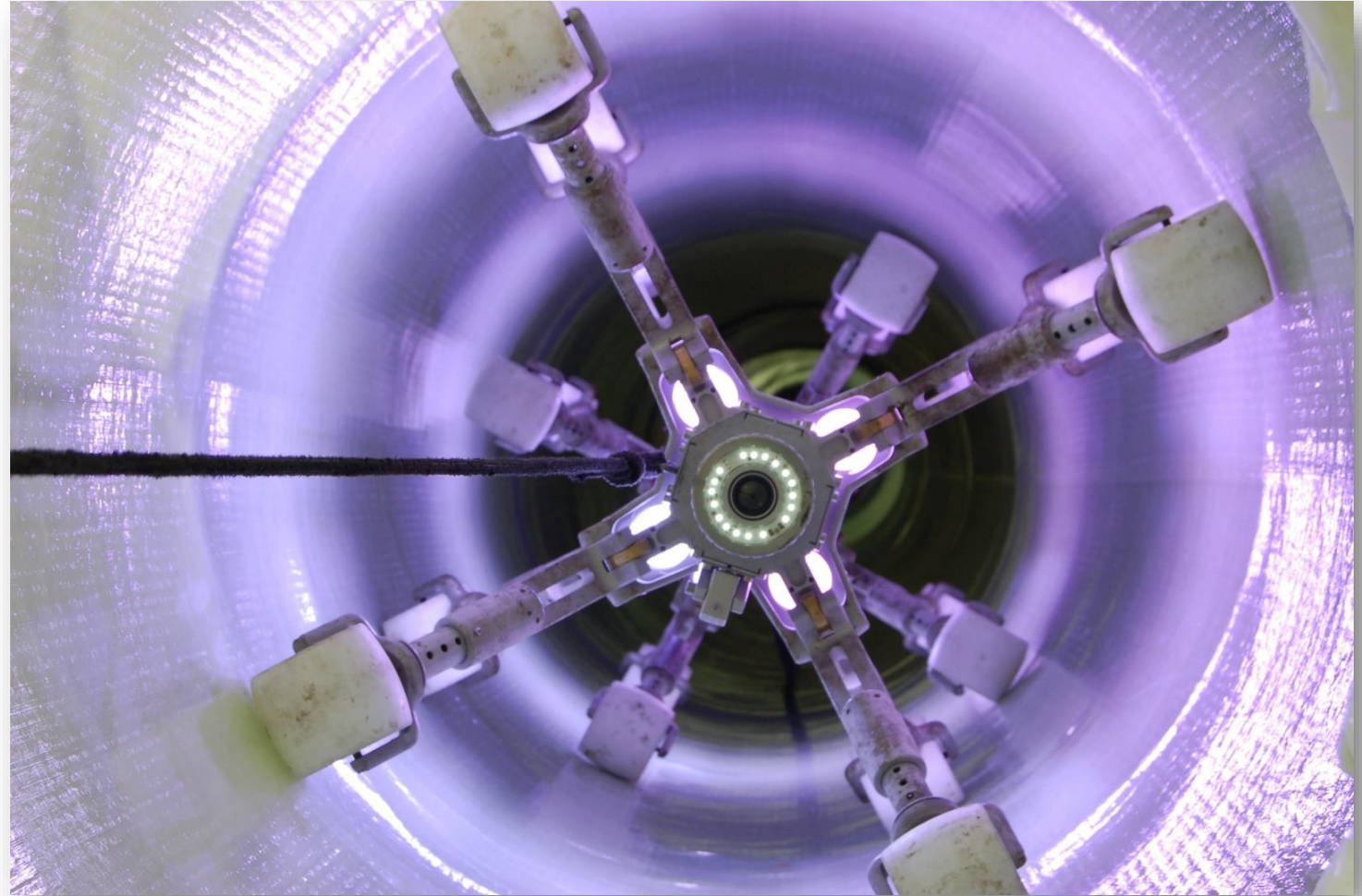
Site Layout





What is UV-CIPP?

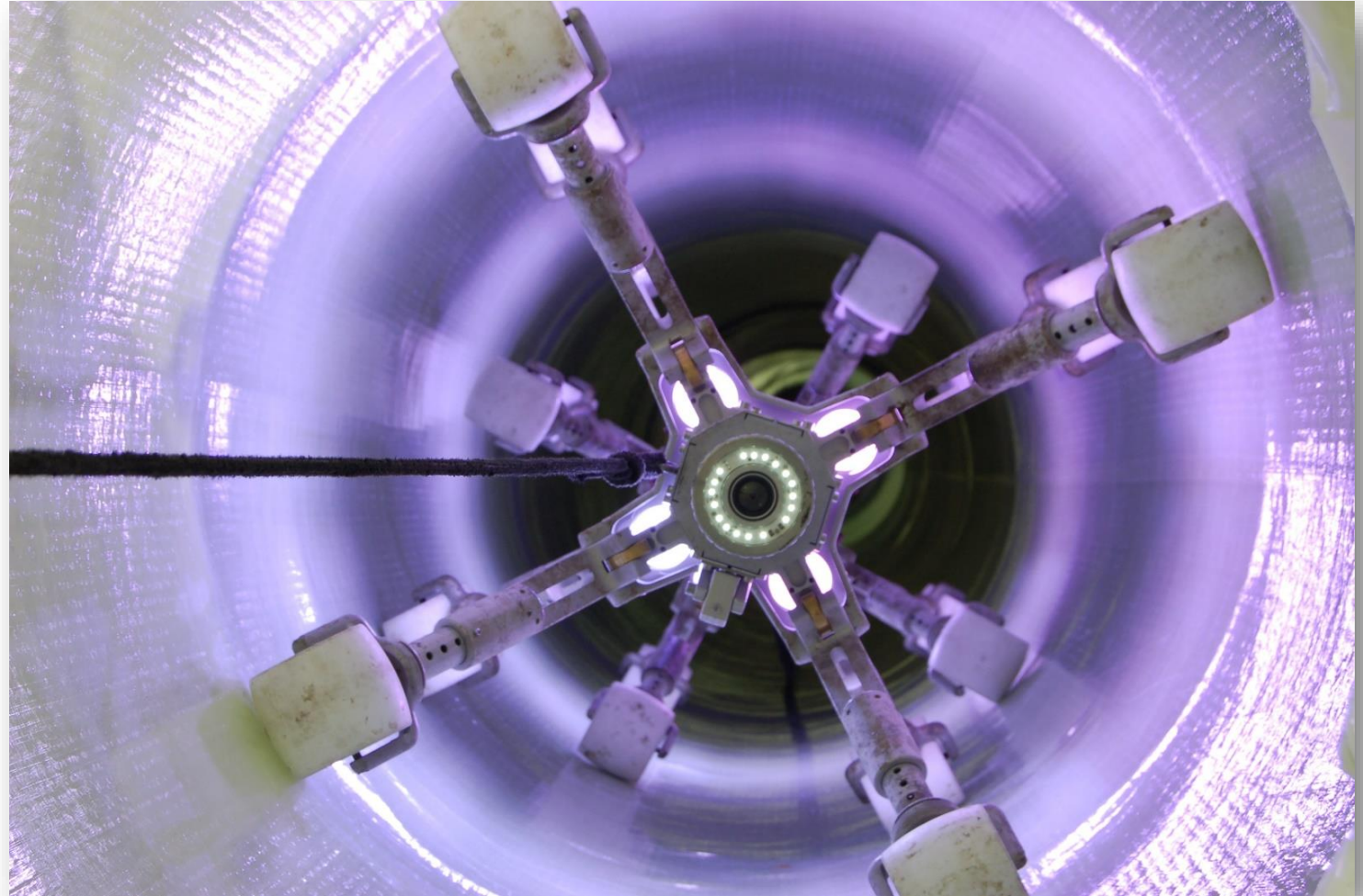
- Rehabilitation of pipes using a glass-woven tube saturated with a UV-sensitive resin.
- Preparation methods are similar to traditional pull-in-place liners.
- Line sizes 8"-64"
- Curing process is completely different heat curing.





How is UV-CIPP different from traditional CIPP?

- Smaller equipment footprint
- Faster cure times
- **Minimal styrene odor / emissions**
- No post-installation water release
- High strength
- Thinner wall design
- **Extended wet-out tube life of six months or longer**
- QA/QC system

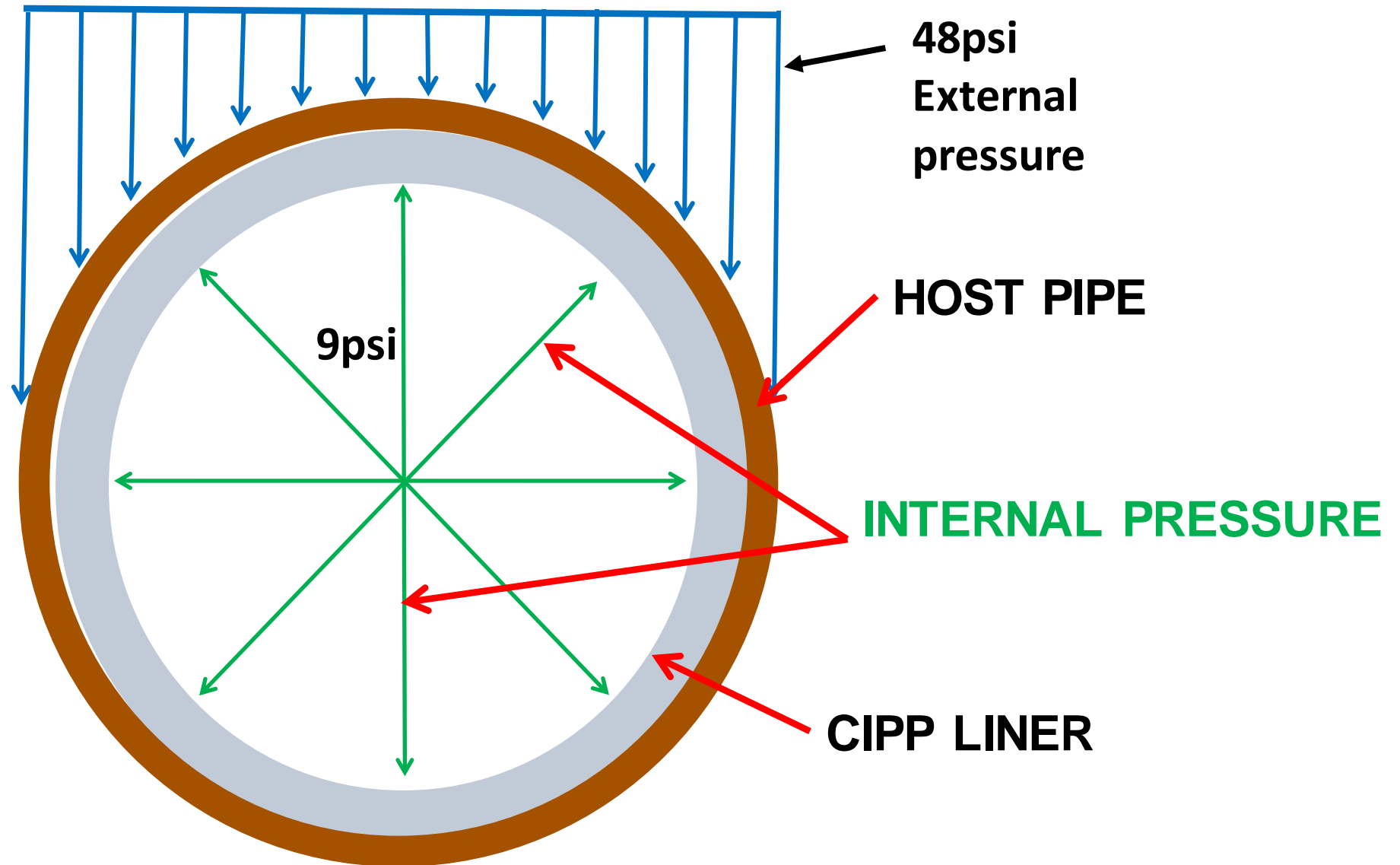




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**EXTERNAL LOADS = Soil
and ground water, and
pile driving**





Why UV CIPP?

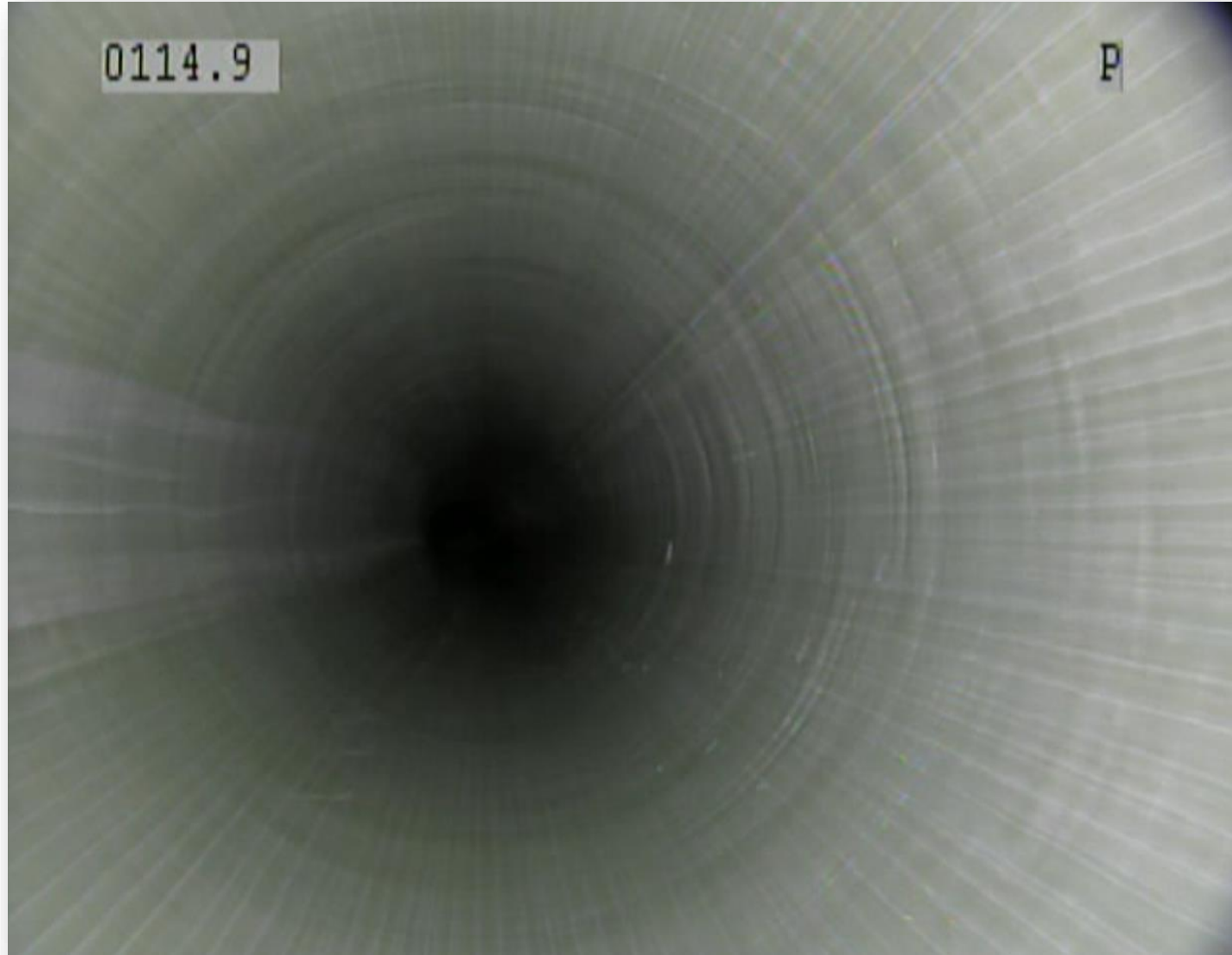
- The technology does not utilize water.
- Faster curing times.
- UV CIPP was only CIPP liner technology to meet design structural requirement.
- Better quality controls in place with UV CIPP.





Unique Project Conditions:

- Siphons located under the Quinnipiac river
- Siphons terminate in chambers instead of MH's
- Multiple bends within the pipe.
- Design parameters
 - External pressure of 48 psi due to local pile driving operations.
 - Internal pressure of 9 psi but not consistent.
 - Total external pressure of 39 psi but was designed to 48 psi.



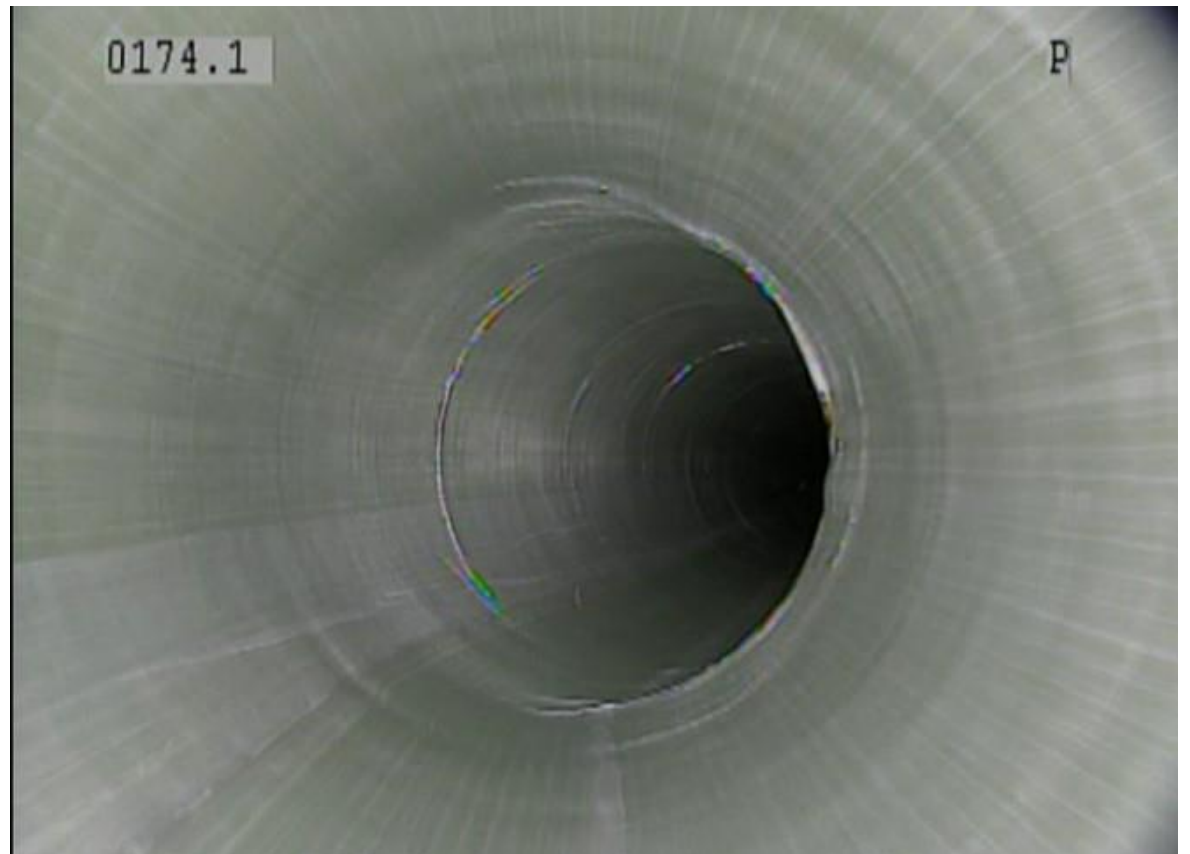


Unique Project Conditions:

- Due to being under the river there were potential for cold spots however UV is not affected by temperature, so this was not an issue.
- Due to the formation of the siphons using water or steam cure posed a challenge with water build up in the low spots. No water is utilized with UV so this issue was not a factor.
- Using a slip sheet was not an option.

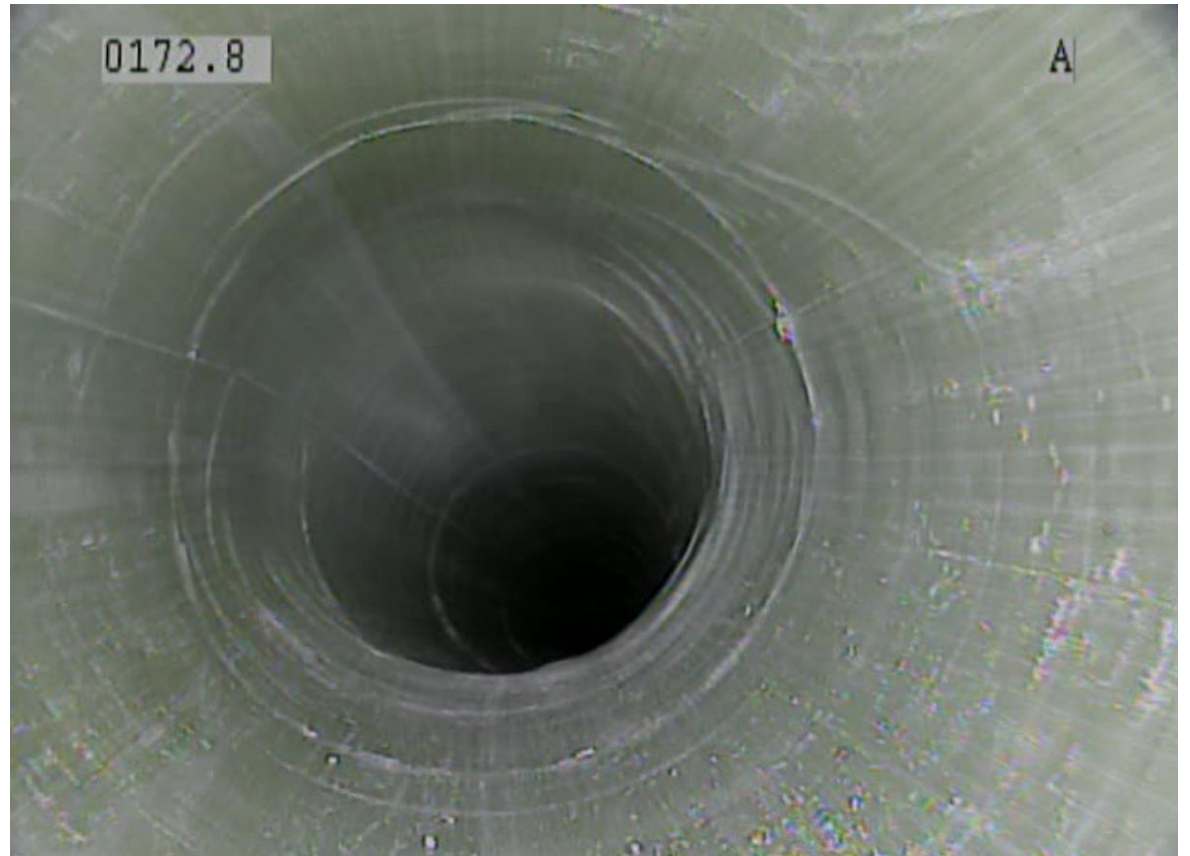
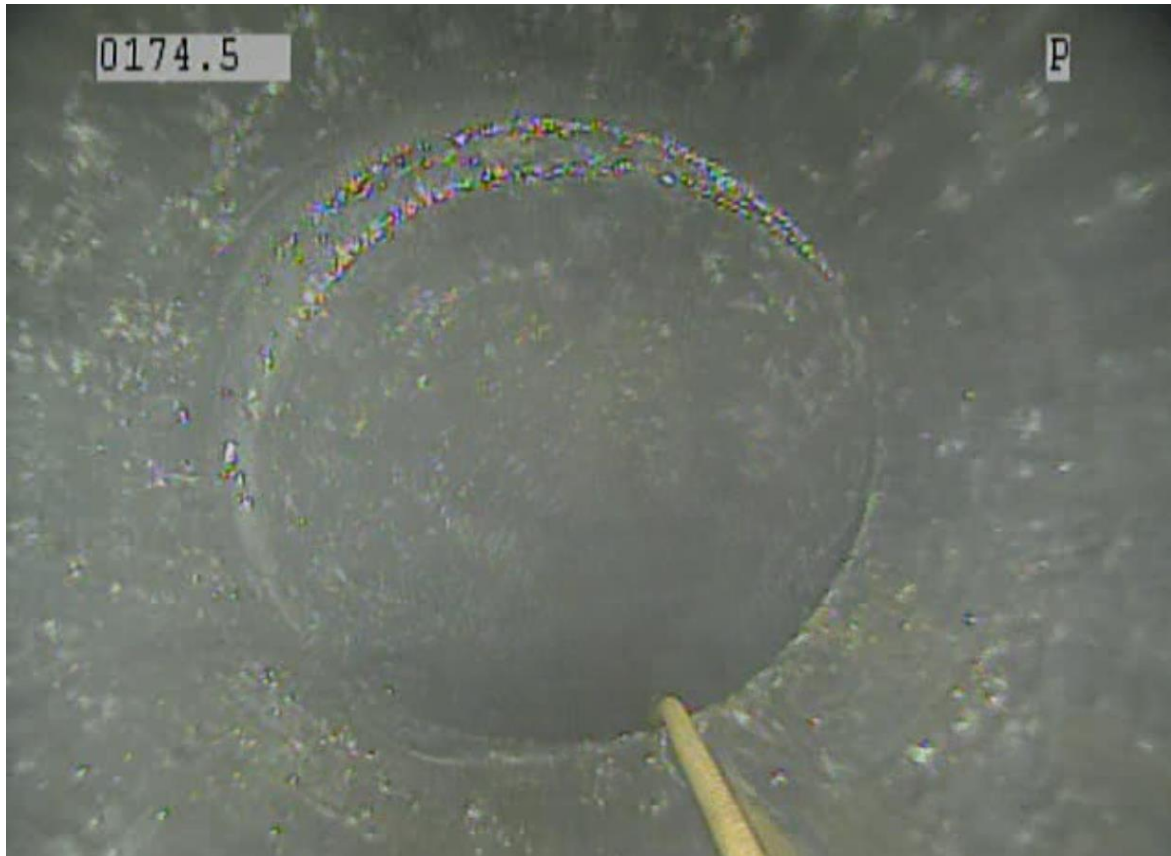


Bend in North siphon before and after





Bend in the South siphon before and after.





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Questions

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