

## CASE STUDY



### PROJECT SNAPSHOT

#### Rehabilitation Method

- UV-GRP CIPP

#### Length

- 1,830 LF

#### Depth

- 10-15 FT

#### Material

- Brick

#### Shape

- Egg-shaped

#### Dimensions

- 33" x 30"

#### Project Completed

- Fall 2017

#### Advantages of UV-CIPP

- Small construction footprint allows street to remain open and passable; no detours needed.
- Provides a high strength, yet relatively thin liner profile for minimal loss of annular space.
- Smooth liner profile improves flow capacity.
- UV CIPP is an environmentally friendly pipe rehabilitation solution due to its no-dig requirements and small construction footprint.
- In colder regions, UV curing method is a better CIPP alternative compared to traditional, yet proven steam and ambient cure technology
- Controlled UV light will thoroughly cure liner and resin regardless of weather conditions.

#### Contact Information

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## UV CIPP METHOD USED TO SUCCESSFULLY REHABILITATE EGG-SHAPED BRICK SEWER BENEATH HISTORIC MAIN STREET IN SACO, MAINE

Size, Shape and Conditions of this Sewer Well Matched for the Ultra Violet Curing Process

#### PRESERVING HISTORY ABOVE GROUND AND BELOW

The coastal town of Saco, Maine was nominated as a National Register Historic District in 1996, making Main Street distinctive and important to the broader understanding of the history and culture of Maine. Historic buildings line Main Street, which also includes local businesses and restaurants with high pedestrian and vehicular traffic. The original Saco sewer system, constructed in the 1890s, was a combined sewer system conveying rainwater runoff, domestic wastewater, and industrial wastewater in the same pipe discharging into the Saco River. Since 1995, the City has been completing an aggressive sewer separation and rehabilitation



Before: CCTV inspection of the egg-shaped brick sewer prior UV CIPP lining process.



After: Post installation footage shows a complete cure and how the UV cured liner conforms to shape of the brick sewer.



## PRESERVING HISTORY ABOVE GROUND AND BELOW (CONTINUED)

program. The City completed sewer separation in the downtown area in the early 2000s. Thanks to the UV CIPP rehabilitation process it continues to use the original brick sewer for wastewater flows.

In 2014, a localized failure and collapse was repaired and consequently discussions of long-term solutions began for the City of Saco, Maine. After CCTV inspection along Main Street, it was discovered that just over 1,800 linear feet of brick sewer, ranging in depths from ten to over fifteen feet was deteriorated past its design life. Deterioration was found throughout the length of the sewer and where they also discovered that many of the old sewer's bricks were missing, as well.

## FINDING A SENSIBLE REHABILITATION SOLUTION

Multiple rehabilitation methods were considered during the discover and selection process. Open cut construction was ruled out based on traffic, timing, location of existing utilities (water, drainage, gas, communications, etc.), depth and the economic/social impacts it would cause to the downtown district. Trenchless solutions were considered because of their proven, non-invasive success. The City was considering two trenchless methods for this project, Pipe Bursting and UVCIPP. Based on cost, timing and environmental considerations, the City ultimately chose the UV-CIPP process. The Ted Berry Company (now Vortex Services) developed a detailed installation plan, using a UV-GRP (Ultraviolet-Glass Reinforced Plastic) CIPP (Cured-in-Place-Pipe) lining specification to maximize installation efficiency and reduce the impact on daily life for the Main Street businesses and residents.

Ted Berry also proposed that all work be performed at night to avoid the added cost and inconvenience of bypass pumping.

## THE UV-CIPP PROCESS A COMPLETE SUCCESS

Rehabilitation began in the fall of 2017. After cleaning and prepping the old sewer, the installation team set up a motorized conveyor load system over the entry manhole. The chosen liner was a seamless liner spirally manufactured to provide superior structural qualities. The chosen liner system utilized a thin HDPE slip-sheet to protect the uncured liner system during installation. Once installed, a high volume low pressure blower truck inflated the uncured liner. After the liner is inflated, the UV light train is installed, and a CCTV pre-inspection is performed to ensure the liner is ready for curing. Critical to the success of every UV-CIPP project is the speed at which the light train is pulled through the pipe by the cure truck. This is predetermined based on the pipe's dimensions, liner thickness and environmental conditions. Lastly, the inner protective film is removed after curing and the newly rehabilitated sewer is returned to full service.

This project was completed on time and within budget taking only two weeks in the Fall of 2017.

*"By completing this project without digging in the roadway, we were able to reduce the costs for public infrastructure improvements while also minimizing the impact to our residents and commuters traveling on our main street,"*  
— Kevin Sutherland, Saco City Manager



*UV-CIPP liner preparing to be inserted into the egg-shaped brick sewer, through a manhole. No digging was required.*

*"This project took a total team effort. Our Vortex Services UV Team did an amazing job working in the tight confines of Main Street at night to minimize the impacts to the residents of Saco and neighboring communities that travel this corridor daily. Knowing we saved the community hundreds of thousands of dollars by utilizing trenchless technology and providing a longterm solution is unbelievably satisfying for our team."*  
— Shawn Ready, Northeast Regional Vice President, Vortex Services (formerly Ted Berry Company)



*Small construction footprint needed by UV-CIPP process allows streets to remain open.*