

PRESSURE PIPE CIPP LINING

The innovative solution enabled swift sanitary sewer repair ahead of New London's tourism season.

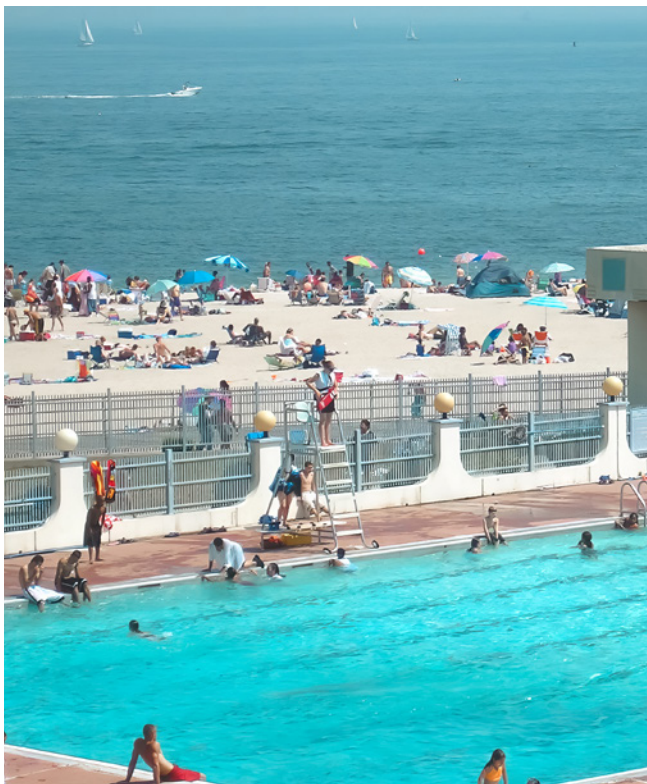




In March 2024, National Water Main Cleaning Company undertook a critical emergency project in New London, Connecticut.

The task involved the rehabilitation of a failed section of a sanitary sewer force main. National Water Main Cleaning Company (NWMCC) was uniquely qualified for this job not only because of their extensive expertise, but because their advanced design-build capabilities allowed for the integration of the design and construction phases, enabling them to respond swiftly and efficiently to the emergency situation.

By installing a CIPP SAERTEX-LINER® MULTI S+ XR that was rated for high-pressure pipes, NWMCC demonstrated the importance of advanced techniques in extending the lifespan of infrastructure while mitigating environmental hazards.



THE CHALLENGE: **A FAILED FORCE MAIN THREATENS COASTAL WATERS AND TOURISM**

New London, a coastal community, faced a severe environmental threat when a force main sewage pipe failed. Force mains are rarely proactively inspected due to their location and pressurization, which can result in immediate and visible crises upon failure. In this case, sewage began to surface and posed a significant pollution risk to nearby coastal waters.

The urgency was heightened by the proximity of a water park, which is a major tourist attraction of New London, just as the high tourism season was approaching. Completing the repairs before the end of May was imperative to avoid severe economic repercussions for the city.

IMMEDIATE RESPONSE: TEMPORARY MEASURES AND SEARCH FOR SOLUTIONS

The city of New London promptly mobilized an emergency temporary bypass system to manage the sewage flow. Initially, the city planned to replace the pipes, but the high cost, extended timeline, and invasiveness of this option led them to reconsider.

Hearing about a possible alternative, New London reached out to NWMCC to explore a trenchless rehabilitation solution.



THE NWMCC ADVANTAGE: DESIGN-BUILD APPROACH

A significant factor that sets NWMCC apart from its competitors is their “design-build” capability. Unlike the traditional “design-bid-build” approach used by other contractors, where design and construction phases are separate, the design-build method integrates both phases. This approach allows for more streamlined communication, faster project completion and reduced costs.

Because NWMCC manages both design and construction, they can swiftly adapt to project changes and implement innovative solutions more efficiently. This capability was a key reason New London contacted NWMCC, knowing that their integrated services would better meet the urgent needs of the project, in addition to their knowledge and expertise of trenchless pipe lining methods.

THE INNOVATIVE METHOD: CURED-IN-PLACE PRESSURE PIPE LINING

Gravity pipes have been lined to extend their lifespan for many years, but lining pressure pipes with a UV curing method is brand new to the industry. Gravity pipes, which rely on the force of gravity to transport sewage, face fewer stressors and can be effectively lined using established techniques that restore their structural integrity without having to withstand significant internal pressure. In contrast, pressure pipes like force mains, continuously endure high internal pressures, making their rehabilitation more complex. The lining material therefore has to be made to custom fit and also be able to withstand constant high-pressure conditions.

The failed force main in New London offered an opportunity to apply an innovative pressure pipe lining technique known as UV CIPP (Ultraviolet Cured-In-Place Pipe) lining. UV CIPP lining is a trenchless rehabilitation process that involves inserting the flexible SAERTEX-LINER® MULTI S+ XR saturated with a UV-activated resin into the damaged pipe. Once the liner is properly positioned and inflated, a special UV light source is pulled through the liner. The UV light initiates a chemical reaction in the resin, causing it to harden and cure in place.



PIPELINE AND LINER SPECIFICATIONS

Pipe Type: Sanitary sewer force main

Diameter: 12 inches

Length: 3,500 linear feet of a 2-mile force main

Liner: SAERTEX-LINER® MULTI S+ XR - Pressure glass fiber reinforced plastic (GRP) liner for wastewater

PROJECT TIMELINE AND EXECUTION

FEBRUARY
2024

New London identified a failure in the force main and promptly mobilized an emergency bypass system to address the issue.

City officials began exploring potential solutions, including an initial consultation with NWMCC for options like trenchless rehabilitation and traditional pipe replacement. A completion date was set for May 2024, aiming to finish the project before the high tourism season began.

MARCH
2024

New London decided to proceed with the trenchless pressure pipe lining technique, considering its cost-effectiveness, timely implementation and minimal environmental impact compared to replacing the pipe.

NWMCC collaborated with city officials to plan the project logistics and establish safety protocols. By mid-March, NWMCC began site preparation, pipe cleaning and CCTV inspection. They placed an order for a bulk quantity of specialized liner from SAERTEX multiCom® in Germany, anticipating the need to fit it to specifications on-site.

To adhere to the tight timeline, NWMCC opted for air freight to expedite delivery, ensuring the project could proceed without interruption once the liner arrived.

APRIL
2024

Because the process is trenchless, only minimal excavation occurred in the form of access pits, underground chambers designed to provide entry points to the pipeline.

The local environment and infrastructure were largely undisrupted. The materials arrived from Germany, and installation of the pressure pipe lining began a week ahead of schedule.

The lining and rehabilitation work was completed within two weeks, finishing by mid-April. This rapid response and efficient project management were crucial in mitigating the environmental and economic risks associated with the failed force main.

By late April, New London was able to conduct comprehensive system testing to confirm enhanced flow rates and pressure resistance. The project was completed ahead of schedule, ensuring that New London was fully prepared for its high tourism season.

KEY TAKEAWAYS



INNOVATIVE TECHNOLOGY

As a trenchless technology, the innovative UV CIPP lining method requires little excavation, preserving the surrounding environment and infrastructure. UV curing is significantly faster than other curing methods, reducing the overall project timeline. The cured liner forms a new, seamless pipe within the old one that can withstand high internal pressures, extending the life of the existing force main.



ADAPTABILITY AND CRITICAL THINKING

NWMCC's design-build approach was pivotal in expediting the project timeline. By integrating design and construction phases, NWMCC could make swift, informed decisions such as air freighting the liner and ordering materials in advance. This seamless coordination and flexibility demonstrated their critical thinking and adaptability in addressing the emergency situation efficiently.



COLLABORATION AND COMMUNICATION

Close collaboration with New London officials and clear communication throughout the process ensured the project met its tight deadline. Safety was a priority, with rigorous protocols protecting both workers and the public.



ENVIRONMENTAL PROTECTION

The rapid response and effective repair mitigated the potential for significant pollution, protecting the local environment and community.

CONCLUSION

The successful completion of the emergency pressure pipe lining project in New London by National Water Main Cleaning Company underscores the critical role of innovative technologies and agile project management in infrastructure maintenance. This project marked NWMCC's first application of pressure pipe lining, setting a precedent for future projects and emphasizing the importance of preparedness, rapid action and advanced solutions to protect public health and the environment.

