



Lanes Group Case Study

Irregular culvert relining

Project:
Irregular culvert relining

Client:
Severn Trent Water

Sector:
Wastewater Network

Location:
Leamington Spa

Challenges and achievements

- Demonstrates the benefits of no-dig pipe rehabilitation for pipes under or close to roads
- Relining a culvert that varied so much in diameter was a first for the Lanes Reline team
- Shows the ability of Lanes to devise a robust solution for the most technically challenging projects
- Demonstrates Lanes' ability to work closely in partnership with clients to adapt approaches safely and effectively, while fully achieving client objectives.

Overview

Severn Trent Water commissioned Lanes Reline to rehabilitate a 47m long culvert in Leamington Spa, Warwickshire. The culvert was one of the most irregular Lanes had ever tackled. The project required careful planning, and significant adaptation during the implementation phase. The job was completed on time, and on budget, demonstrating Lanes Group's expertise and capability, and the benefits of no dig pipe rehabilitation for highway projects.

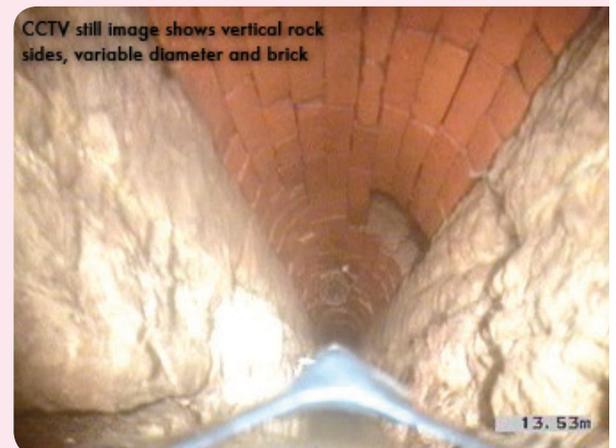
Lanes Group is the largest independent supplier of specialist underground pipeline and utility services in the UK. We have a national network of 23 depots providing a comprehensive range of high quality, innovative utility, drainage and maintenance services for domestic, commercial and public-sector customers.

The project

This was a 47 metre long culvert running down the middle of a street, just off the town centre. The street is used regularly as a short cut, especially during the rush hour. A no dig relining solution was highly desirable because the street was so important to the town's traffic management system.

The culvert was irregularly shaped, with a constantly changing diameter, which meant it could not be measured with profiling equipment. It appeared to have been cut from solid rock, had a flat base and a brick-lined roof. It was badly damaged, with many bricks missing.

Lanes agreed to carry out a man entry to measure the culvert and plot the lateral connections manually. The survey showed the diameter ranged from 570mm to 650mm.



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The project continued

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It was decided a 600mm diameter liner would be the best fit, as the liner material will stretch up to 18%. Both Lanes and the contractor agreed that minimal creasing at some points in the culvert was acceptable.

Dealing with laterals

The culvert contained eight lateral connections. One of them, a 150mm diameter cast iron pipe, entered through the roof, at an angle, and protruded 500mm into the culvert. Clearly Lanes could not reline over it.

It was not possible to cut it out with a robotic cutter because the culvert narrowed at that point, so the larger KA-TE cutter with the required reach could not get into position. A Prokasro cutter, designed for egg-shaped sewers, was considered, but it did not have the necessary reach either.

It was agreed that a mini excavation should be carried out, just before the liner was installed, to cut the pipe. The excavation would be left open. Then, once the liner was installed, the connection could be cut open from above, and the pipe cemented in place.

The lining

With everything ready – enabling works complete, materials, plant and equipment in place – installation was scheduled for a weekend to minimise impact on commuting traffic. The 12mm thick liner, installed using the CIPP system, went in smoothly on the Saturday.

Opening the laterals

Once the liner had cured, a KA-TE robotic cutter was sent into the culvert, where it opened three of the remaining connections. A man entry was required to open the other laterals by hand, using air tools.

All H&S procedures were followed and a safe system of work was agreed with STW. Appropriate documentation, including method statements and risk assessments, were completed. The upstream manhole was capped off. Though the weather was fine and dry, over-pumping was set up. The final four laterals were then opened on Sunday.

Good result

A final post-line survey showed that the liner was successfully in place and to a quality acceptable to the client. The irregularly shaped culvert, with its varying diameter and now non-protruding connection, was once again structurally sound.

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CCTV still image shows vertical rock sides, variable diameter and brick

Rough job

CCTV survey image shows the irregular rock walls of the culvert.



Plan shows Chandos Street culvert and proximity of other services also in the area

Vital route

A no dig solution was essential to minimise traffic disruption.

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Cut above
CCTV survey image shows the protruding pipe.



Job done
The culvert with the liner in place.



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