

Yeovil Storm Sewer Renovation

customer care & environment concerns key to success

by
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In 1961, the then local water authority for Yeovil (population 42,500), Somerset, installed a storm water sewer through the Balmoral Road area of the town, a major urban centre in South Somerset. More recently, investigations by the Small Schemes division of Wessex Engineering and Construction Services Ltd (WECSL) part of Wessex Water, showed the pipeline was in urgent need of repair. The sewer showed signs of a classic failure. It had longitudinal fractures at the spring points, in the soffit and in the invert of the pipe. Poor working practices, pipe bedding and backfill compaction during the initial installation works were cited as the cause. Rehabilitation of the pipe might at first have appeared to be relatively easy technically, but its location, routing and size (diameter) meant that good planning and customer care was needed to ensure no undue pressures were placed on the locality, the residents or the environment.



Yeovil: View inside deteriorated storm water sewer showing the fracture failures

photo courtesy Wessex Engineering & Construction Services Ltd

Options

Whilst investigating the various options available to rehabilitate or renew the pipeline, the 'open cut' option was quickly eliminated. Such work would have involved very significant disruption to the (high density) population and traffic for up to four months. In addition, there could have been significant compensation payouts for those affected by the works, as a number of buildings would have needed to be demolished.

The only real and cost effective option was a trenchless one.

Core targets

Wessex Water has a company philosophy of 'sustainable operations', so WECSL has worked closely with various contractors and

organisations to utilise trenchless systems and services. A driving force behind the core activity of Wessex Water is 'sustainability' or viability for the long term whilst taking responsibility for the way it looks after the resources, upon which the company and future generations depend. This has enabled the company to make major investments in its water and sewer networks infrastructure at minimum cost and disruption to its customers.

WECSL engaged OnSite Central Ltd., one of Wessex Water's specialist trenchless contractors to undertake the lining works required in Yeovil. Preliminary works to establish the possible effects of the works on local residents and the environment were undertaken, including involvement of the local Environmental Health Organisation (EHO) and the local Highways Authority. Significant



Setting up one of the liners prior to installation on the Yeovil project

photo courtesy Wessex Engineering & Construction Services Ltd



Feeding the liner into the host pipeline during the installation phase of lining

photo courtesy Wessex Engineering & Construction Services Ltd

potential for problems, particularly in terms of customer relations, were highlighted.

An information package was sent to local councillors and 1,000 letters were sent to residents. Meetings with residents and local interested parties were held to ensure that everyone knew what was planned and how it would work.

Ecological surveys highlighted slow worms nesting adjacent to the upstream end of the works, so Wessex Water appointed an ecologist to ensure that there were no infringements of the Wildlife and Countryside Act.

Linings

Having decided on a lining technique for the pipeline rehabilitation, OnSite's Premier-Pipe Division was mobilised to undertake the work. It was decided to utilise the long established Premier-Pipe Lining system for the installation.

Premier-Pipe is a CIPP (Cured In Place Pipe) renovation process which is installed without the need for costly and disruptive excavation.

The linings are individually designed and manufactured to suit project requirements. The lining tube is made of polyester felt with an outer coating of polyurethane. The liner is impregnated thoroughly with a liquid resin chosen to suit the working environment of the pipe. Once impregnated, the liner is installed using the inversion method and cured with hot water.

In Yeovil, four lining installations were completed totalling 389m in length. Two were 750mm diameter, including one 55m lining and one 125m lining. The other two installations were a 135m lining in a 900mm diameter pipe and a 74m lining of a 600mm diameter pipe.

In the 900mm diameter pipe, the liner was designed with a wall thickness of 24mm to withstand a hydrostatic ground water pressure of approximately 2.5m. All the linings were installed using a standard scaffold tower arrangement. Installations on the 750mm diameter pipe were in an amenity area, so few problems, either technically or in terms of customer relations were encountered.

To minimise disruption to local residents etc., for the remaining linings it was decided to install two liners from a single access point, one going downstream and the other upstream. Given the diameter of the pipe and the volumes of water required for the installation, there was a significant potential for local flooding should a 'situation' occur during installation. Taking this, and the unpredictability of the weather into account, eight 6 inch pumps were provided to ensure adequate capacity to pump water away from the site should it be needed.

As the linings required 330,000 litres of water for insertion and curing, and in line with Wessex Water's policy of sustainability, it was decided to tanker in and utilise final effluent water from a local Wessex Water operated sewage recovery works, as opposed to fresh water from the mains. To minimise any potential problems, two 3 million BTU boiler trucks were used to heat the curing water in the liners, each working in conjunction with the other. Once curing was completed this 'effluent' water was simply pumped back into the local foul sewer system for disposal.

Preparatory civil works started on 4 November, 2006, which included the construction of acoustic fences to minimise potential noise disturbance. Once installation work started, the four lining runs were completed in just ten days, including moves between installation

sites. Each of the individual linings took about 25 hours to install and cure including reinstating all connections. WECSL also provided acoustic measurements to the local EHO during the course of the operations and all were found to be within legal limits.

Because three of the installations on the 900/750mm diameter pipes required overnight operations, WECSL offered hotel accommodation to ten families whose homes were directly affected. Extra security was also brought in to ensure the empty homes and the public were kept safe.

Despite all this activity, no complaints were received by Wessex Water throughout the course of this 20 day project. The work was also finished on schedule and to budget.

Ultimately, the success of the project was attributed to the joint planning and installation procedures. Subsequent to this work, WECSL is undertaking an exercise to establish the carbon footprint of this lining scheme, comparing the whole life carbon consumption with that of the traditional open cut option. It is hoped the results will encourage more focus on the 'no dig' options within Wessex Water.

Note: *The author of this article, Julian Britton, is Senior Engineer, Critical Sewers Team, Small Schemes, with Wessex Engineering & Construction Services Ltd - a division of Wessex Water.* ■



Launching the liner from the scaffold tower