



Lanes Group Case Study

All-terrain sewer renovation

Project:

All-terrain sewer renovation

Client:

Morgan Sindall
(for Dŵr Cymru Welsh Water)

Sector:

Wastewater network services

Location:

Blackmill, Bridgend, South Wales

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Lanes Group Plc

Marketing Department

Building 1, 300 Lansdowne Road,
Monton, Eccles, Manchester,
Greater Manchester, M30 9PJ.

Tel: 0161 788 2266

Email: sales@lanesgroup.co.uk



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0800 526 488

Challenges and achievements

- Innovative approach to UV lining, including lining a curved sewer
- Overcoming hugely challenging terrain through use of all-terrain vehicles and extensive enabling works
- Meeting strict environmental requirements by working in a nature conservation site
- Completing project during one of the wettest periods of weather on record
- Meeting requirements of local residents and businesses which meant working outside conventional hours
- Despite all the challenges, completing the project on budget.

Overview

Lanes Group was commissioned to renovate a 3km stretch of combined trunk sewer, with the aim of reducing excessive flow rates that were causing increased spills from the combined sewer overflows (CSO).

The sewer could not be surveyed beforehand, the landscape was hugely challenging and the weather conditions often torrential. There were buried manholes, no roadways and environmental issues from working on a Site of Importance for Nature Conservation.

Client's view

"Lanes successfully rehabilitated the Ogmor Valley trunk sewer for this scheme which aimed to reduce infiltration to the system and subsequently the pass forward flow to assets further downstream. The geographical location was a major obstacle, but the challenge was met head-on by the Lanes team."

Project Manager Kevin James,
Morgan Sindall.

"Thank you for the great project delivered."

Project Manager Imogen Brown,
Dŵr Cymru Welsh Water



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The project

Sewers from Ogmere Vale and Gilfach Goch come together at Blackmill. CSOs offer flooding protection in times of system overload. However, heavy groundwater infiltration was causing flow rates greater than the sewer's capacity. There was a need to improve the CSO performance and reduce spills to the River Ogmere.

An engineering report commissioned by Natural Resources Wales (NRW) recommended remediation and a flow reduction of 100 litres/second.

Difficult conditions – preparation was key

The terrain was at best difficult, at worst inaccessible, crossing woodland, farmland, river, cycle path, highway, factory and housing estate. Some sites were up to a kilometre away from a road. Manholes were hidden by foliage, located on almost vertical slopes or on the riverbank. On top of that, the work was done during some of the wettest weather on record.

Lanes consulted NRW about environmental issues and Bridgend Council about public access, cycle paths and river crossings (via flood defence consents). Lanes also obtained road closures and liaised with community groups, residents and businesses.

Fallen trees were chainsawed and left to biodegrade. Scaffolding bridges were built to carry over-pumping across the river, and river crossing points created to move heavy plant. Willow revetments and coir mesh were installed to stabilise the river banks. Biodegradable Sedimats placed on the riverbed below the crossing prevented disturbed sediment from polluting aquatic habitats.

Temporary roads, 1,000m long, were built through dense woodland with 1,000 tonnes of stone. Lanes cut back undergrowth, whilst an ecologist did a fingertip search for wildlife and directed a route through the trees. Where fences were cut, gates were fitted.

Machines and equipment were stripped from existing vehicles and placed on all-terrain vehicles, such as Unimogs, Mules with trailers, or Terrajets.

Two tonnes of Permasoil helped increase the load bearing of excavated earth by reducing compaction and moisture, eliminating the need to haul away spoil.

Invasive plants, including knotweed, hogweed and balsam, were removed and piled up to biodegrade, in accordance with NRW guidelines.



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The project continued

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The project

Some lengths of sewer pipe were suffering from infiltration and in need of rehabilitation. The pipe was anything from 10cm to 7m beneath the surface. Due to high flows, only 10% of it had been surveyed, so its condition was unknown.

Upstream, Kaiser Whale recycling jet vac tankers used a jet head with chainflails to cut roots out of the sewer. A Terrajet was connected to the jet vac on the cycle track to reach 300m off road, with a further 300m via a separate reel on a skid track.

Over-pumping was established. Finally, the sewer could be surveyed. Real-time reporting allowed each survey to be examined and signed off by the client before relining began.

UV relining reduced environmental impact

Lanes used ultraviolet (UV) technology to cure the liners instead of traditional hot cure. This meant there were no scaffolding platforms, boiler units, or tankers to remove process water. Also, no risk of styrene-contaminated water spilling into the river.

Though it meant less heavy equipment, a quicker cure and reduced environmental risk, the UV light train still had to be manoeuvred to the access points, 80% of which were off-road. So the rig was transferred from its 7.5 tonne wagon to a Unimog all-terrain vehicle.

Over-pumping was established over several sections at once to optimise flow diversion. Two 3-tonne pumps at full capacity into 2x8" lines were backed up by a third pump on permanent standby. After each liner had been installed, each section was surveyed and signed off.

New approach to UV relining

Over three months, the team installed 69 liners ranging from 13m to 105m in length and 375mm, 450mm or 525mm in diameter, including one with a sweeping bend, even though UV relining is conventionally only carried out on straight pipes.

Relining the sewer on Blackmill's main street was scheduled for a weekend, after shop trading hours, to reduce disruption.

Additional works

Lanes sealed 60 manhole chambers to further reduce water ingress. Elsewhere on the network, three emergency collapses were excavated and pipework replaced by Lanes, working at night to lessen disruption.



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Innovative response to major challenges

- Pushed boundaries with UV technology to ensure success
- Innovative transport and access solutions for ground conditions and site constraints
- Nothing was standard so each step was tailored to fit
- Liners transported in a stillage and fed in via a 13 tonne excavator
- Special work platforms (stone or scaffold) built at embankment manholes
- 2 tonnes of Permasoil helped to reinstate farmland
- Silt fences, revetments and Sedimats used to protect river
- Timber pedestrian ramps purpose-built for roadwork
- Pre planning: some chambers not accessible, so the UV winch was put in downstream and the UV train pulled through multiple chambers from up to 300m away
- Real-time reporting to facilitate the investigation, approval and renovation process.

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Go anywhere

All-terrain vehicles were used extensively to carry materials and equipment to worksites.



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Bank stabilisation

Protecting the environment during the project was a key priority.



Tough terrain

Sewer assets were found in difficult locations - such as the manhole in the top left of this picture.

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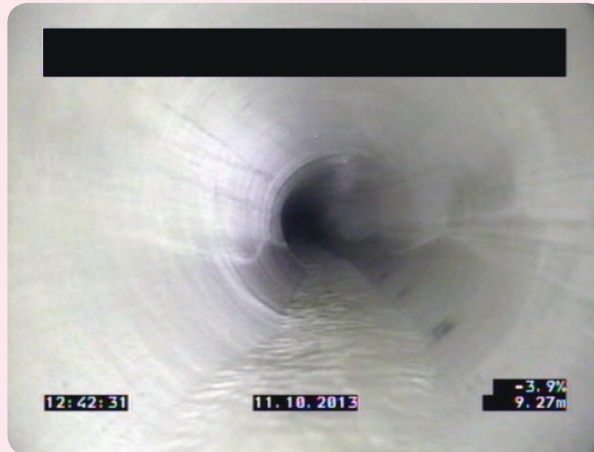
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Job done

CCTV survey image shows the new UV liner in place.

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