

Sewers, drainage pipes and liquid storage assets should be regularly inspected and cleaned to ensure they are functioning efficiently, because timely maintenance can reduce the risk of unplanned and costly interruptions to production. After years of heavy use these assets can become corroded and weakened which, if they are not maintained, can lead to collapses and blockages necessitating costly repairs. Their condition can be critical as they enable the efficient storage, transportation and disposal of waste liquids.

**Danny Heffernan**, Managing Director of waste water rehabilitation specialist Ferro Monk Systems

# WASTE WATER ASSETS

— vital resources that are often forgotten about

## Assessment

The condition of assets is generally determined via remote controlled CCTV viewed by highly trained specialists. Accurate measurements are taken of the host pipes' length and diameter, together with details of the depth and any loadings. If the inspection shows up any problems there are a number of cost-effective and lasting fixes available. For the most part, these repairs

can be carried out remotely and without excavation, (known as 'Trenchless' or 'No-Dig' technology), thus minimising disruption. Investigation and planning are therefore key features which help to ensure that works are executed without incident. On all projects, a specialised rehabilitation manager has to carry out an initial site survey to determine the characteristics of the site and decide if any particular measures or considerations need to be made.



## The problem

Many processes produce high volumes of liquid effluent and waste water. Often this effluent can be a cocktail of aggressive chemicals, which need to be safely stored and transferred through pipelines (usually sewers), to wherever they may need to be treated prior to disposal. If the effluent is aggressive, it is likely to increase the likelihood of damage to the connected drainage and storage assets.

Natural contaminants can be equally corrosive: for example, hydrogen sulphide (H<sub>2</sub>S) – a gas that naturally occurs in sewer silts - can severely corrode both pipes and chambers and actually eat into the concrete and mortar above the liquid flow levels. This can already cause major problems in itself, however, when this is combined with waste effluent it can be a recipe for disaster if allowed to continue unmonitored. The chemical cocktail within the waste has a similar effect below the liquid level as the H<sub>2</sub>S does above, thus placing the entire system at risk of developing cracks, holes and possible



Manhole sprayed with Ultracoat

collapses, along with corroded manholes and pipes. In turn the exfiltration of liquids from these problems can contaminate the surrounding soil or pollute water courses. It therefore clearly pays to be proactive ensuring that water pipes, especially those carrying potentially corrosive wastes, are regularly monitored and well maintained.

## Regular maintenance

A good example of this problem is at the UK-based crop chemicals specialist Syngenta. The company's production site at Huddersfield, UK, carries out regular CCTV inspections, manhole to manhole, full length lining, and short sleeve patch repairs to cracked and effected drainage pipes. The company recently introduced an acid-resistant Cured In-Place Pipe (CIPP) lining system, in which corroding pipes were lined with vinylester resins. This type of lining is even more resistant to corrosive and aggressive effluents than standard piping materials.



CIPP Lining

CIPP is a Water Research Council (WRC) approved Type II lining system designed and installed in compliance with the UK water industry specification 04-34-04 which has been developed to withstand either an external static water head (ie ground water level) or ground and traffic loading. It will seal a damaged pipe preventing infiltration, exfiltration, halt further deterioration of cracked and damaged pipes, bridge gaps and open joints, seal unwanted lateral connections, prevent root ingress, improve flow characteristics with minimal loss of cross sectional area and protect against corrosion from aggressive effluent flows. Used for circular, egg shaped or rectangular pipes or culverts ranging in size from 150mm to 1200mm diameter or equi diameter with a maximum deformation of 10%, CIPP may be expected to last for around 50 years.

The CIPP lining is supplied in the form of a pre-manufactured tube liner which has been impregnated with a mix of resins and catalysts and installed in around a day. Robotic cutters, monitored and operated by in-pipe CCTV, remove intrusions in the pipe before the lining or patch is applied, and re-open lateral connections once the lining is introduced.

## Eco friendly solutions

More recently 100% solids epoxy sprayed lining systems have become available, mainly in response to calls for environmentally friendly solutions, - for example, Ultracoat from Ferro Monk Systems. Epoxy sprayed linings contain no volatile organic compounds (VOCs) and can be used to rehabilitate waste water systems with confined spaces with no risk of combustion to hazardous materials. They are highly resistant to aggressive effluent, algae and bacterial growth; can tolerate high temperatures, and high levels of sulphur dioxide, acids and alkali; can be sprayed onto damp surfaces and applied quickly, bonding well. Assets can be back in use within as little as two hours after application.

Sewer and drainage systems repaired or maintained by experienced and reliable contractors reduce risks to businesses, ensure less down-time, lower costs and can provide renewed confidence that drains and sewers are functioning effectively. ✨

[www.ferromonk.co.uk](http://www.ferromonk.co.uk)