WATER IN ACTION

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Preventing water supply disruptions and preserving trees in Shanghai

The rapid development of cities put huge pressures on the infrastructure which means that traditional solutions fail in a relatively short time. Such was the case in Shanghai where, after only 20 years, an iron water main in a congested inner suburb needed urgent replacement.

The solution was PE relining. Requiring only 30 small pits and a mere three months time, the Shanghai Pudong Water Company replaced 2.6 km of water pipes with a durable system, ensuring minimal disruption for residents and preservation of the surrounding greenery.

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Improving efficiency of the water supply is a key element to ensure sustainable management of the resource – particularly in areas of high water stress and rapid development.
Whether caused by decaying infrastructure or poor pipe standards, water leaks and service disruption are a plague affecting many networks and cities around the world.
In mega-cities like Shanghai, the renovation of water networks has to satisfy many sustainability challenges.

With a population of 2.8 million people, Pudong is one of the most vibrant areas of Shanghai in China. After only 20 years of operation, a 2.6 km cast iron pipe network in the area has begun showing signs of age. Leakage has occurred at the joints and across parts of the pipe, resulting in frequent repair and maintenance. The pipeline had to be repaired 36 times in a period of merely four years, causing disruptions to residents in their daily lives. The city water authority, the Shanghai Pudong Water Company, decided to replace this section of the pipeline and started evaluating alternative options.

Ensuring minimal disruptions

The Shanghai Pudong Water Company required a durable, long lasting and cost-effective solution. Other challenges included ensuring minimal disruption to the residents living in the Pudong area and preserving the surrounding greenery.
The area where the defective pipeline was buried comprises two main roads lined with 400 trees. The traditional technique of open trenching would mean severe disruption to traffic and felling of all 400 trees.
Furthermore, water flow to residents had to be restored quickly after the public works while the hydraulic capacity of the existing network had to be maintained.

Applying trenchless installation

The job was contracted to Shanghai Pudong Water Supply & Drainage Construction Engineering Co. Ltd, a subsidiary of Sade, which is part of the Veolia Water Group. To minimise damage to the environment and disruption to local residents, and to cope with the hydraulic design, the company decided to employ a trenchless close-fit technique called “Swagelining” using polyethylene PE100 pipes. The pipe chosen is produced using the BorSafe™ PE100 compound from Borouge and was recommended by Shanghai Chinaust Plastics Corp. Ltd. – a market leader in the pipe manufacturing industry.

The trenchless technique would ensure minimal disruption to traffic, conserve the environment and maintain distribution of a high water flow to the local community after renovation work is complete.

Durable, long lasting pipeline

A total of only 30 pits were dug to insert the PE pipe sections and connect them to the other sub-networks in the pipeline. Project work began at the end of July 2006 with installation of the bypass scheduled to be completed within three months.
Besides its durability and ease of installation, the new PE pipe section ensures drinking water to the Pudong community throughout its long service lifecycle and prevents leakage.
In addition, 400 trees were saved and will continue to provide much needed greenery and shade to the local residents.

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