



WATER IN ACTION

Partnerships

Knowledge

Solutions

Enhancing the sustainability of Malmö's sewer network

Sanitation is a vital yet too often ignored challenge, and the durability of buried sewerage system materials is rarely considered by municipalities.

The city of Malmö, Sweden, conducted a 6 year test programme to assess the resistance of sewerage pipes materials to tree root penetration.

The research marked a step change for the sustainability of these pipe systems by using welded PP-HM materials. Malmö's analysis showed how closely economic, social and ecological benefits are linked together for a sanitation solution.



By preventing the contamination of clean water and the environment, sewage disposal dramatically reduces the outbreaks of water-borne diseases. In fact, sanitation was ranked by the British Medical Journal readers as the most important medical advance in the past 150 years. Yet the importance of keeping the buried sewerage system in good shape is often ignored by most people.

Enhancing the performance and overall sustainability of sewage networks can deliver environmental, social and economic benefits to the communities.

Testing the sustainability of solutions

To better understand the problem and to help find a long-term solution, in the early 1990's, Malmö installed an innovative test ring to study different pipe materials. Trees were planted close to the test ring and, for a period of six years, underground camera-inspections were carried out every two months to see how the various materials were performing.

Based on the results of this test ring, the Malmö City Council decided to install a system of fully-welded polypropylene (PP) sewerage pipelines. Malmö's material choice went to the Borealis BorECO™ PP-HM, which was, at that time, the first material bringing the benefits of a light-weight, durable plastic solution for non-pressure pipe underground sewerage.

Costs and economics are also part of the sustainability of a solution. Although at installation fully welded systems can be around 50% more expensive than the cheapest solutions available, the cost of routine maintenance work over the system's lifetime is substantially reduced, enabling the additional investment to be quickly repaid.

Proven fit

Malmö's analysis showed how closely economic, social and ecological benefits are linked together for a sanitation solution.

The long-term performance reliability enables high quality systems that require little or no maintenance or repair over a long working life. And the problem of root penetration into the sewer system and its related environmental risks were solved.

Since the test, Malmö has been laying some 80 km of new generation PP-HM sewerage pipelines.

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Because of its exceptionally green design, Malmö is known as Sweden's 'Park City.' However, while providing an attractive and healthy environment, over the years, the benefits of beautiful surroundings also had a growing and hidden cost to the community.

Trees root penetration

The Malmö sewer network was suffering from significant leakages both into and out of its pipe system, caused by the progressive penetration of tree roots. Old generation piping materials are particularly vulnerable to this type of damage, as well as surface or joint damage resulting from ground movement and the sulphuric acid corrosion of the concrete and the metal that reinforces wires.

In addition to soil and ground water pollution, a side effect of leaking systems is that water treatment plants have to be designed and operated at a much higher capacity than actually required to satisfy the requirements of a city's population. This adds extra costs and unnecessary energy consumption.

For the city of Malmö, the bill for renovation caused by root penetration of its sewer network added several million Swedish Krone to the municipal budget and therefore required an effective solution.



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