References

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Uponor involvement

- 2,2 km Weholite tunnels in diameter of 2 200 mm

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The Weholite infratunnel in Linköping is almost 2 km in length and 2,200 mm in diameter. Water, sewage, district heating and cooling pipes as well as electricity and data cables are installed in the tunnel.
An almost two-kilometre long infratunnel with an internal diameter of 2.2 metres will house all of the piping needed for the infrastructure of a new city district being added to the southern Swedish city of Linköping. Excavations in the streets and residential areas will soon be history, since all maintenance and installation work will be achievable within the infratunnel.

Project Facts:

Location	Completion
Linköping, Sweden	2014

Vrsta objekta

Municipal

Project Type

New building

Almost two kilometres long and 2.2 metres in internal diameter, the Weholite infratunnel was installed in the Vallastaden district of Linköping during the summer of 2014. Vallastaden is the site of a modern, ecologically sustainable city district, now under construction and intended to house around 10,000 residents. A housing fair area will also be built on the site. ”All pipes and cables in the new residential area will be located in the Weholite infratunnel. Water, sewage, district heating and district cooling pipes, as well as electricity and data cables, will run through the tunnel,” says Andreas Lillmals, site manager at Uponor Infra.

The infratunnel will also house a waste collection pipe system for the area, which will use suction and air flows to carry waste

to a collection point. Uponor Infra has been in charge of the Infratunnel's design, manufacture and installation. The customer is the Technical Department of the City of Linköping. Lillmals explains that Uponor Infra installed its first infratunnels in Germany in the 1990s. ”However, they were only a few hundred metres long.”

Excavation-free maintenance

The great advantage of an infratunnel is the fact that it relieves cities from a familiar curse: regular hole-digging in streets. ”All maintenance work and tasks such as the installation of new pipes can be handled in the tunnel. There is no need to dig holes in streets or redirect traffic. Residents won't even be aware that something is going on underground.”

Working is safe in a ventilated and well-lit tunnel. There is no need for heating, since the subterranean temperature is five degrees year round. Workers can access the tunnel via concrete chambers built at turning points. The tunnel also branches off to properties located at intervals along its route. ”An infratunnel is a slightly more expensive solution than simply installing pipes and cables directly in the ground in the traditional manner. However, because pipe maintenance and adding more infrastructure are so easy, the tunnel will pay itself back with time,” explains Lillmals.

Christian Vestman at Uponor Infra's Project Services points out that providing pipes and cables with the protection of an infratunnel lengthens their maintenance intervals and lifecycles. ”Because the pipes do not come into contact with groundwater, for example, their valves do not rust.” ”And when the need arises to renew cables, financially valuable materials containing copper are easy to recover,” Vestman comments. It is estimated that the infratunnel itself will last for at least one hundred years.

In a greenfield site – or the middle of a city

Vestman explains that infratunnels are ideal for new, greenfield sites and locations where excavation is hampered by groundwater or bad soil conditions. ”However, an infratunnel is also a great solution for built environments and sites that are criss-crossed by a network of pipes and cables. In pipe work, the price of the pipe is not the key issue. Repeated excavation, asphalting, kerbing and landscaping are the most expensive items.”

Excavation is also hard on underground infrastructure. ”When a lower set of pipes is renewed, during the backfill phase it can be difficult to return the ground to its original firmness. Such work can cause problems for the upper pipes, which only come to a head a few years later.”

Module solution speeds up installation

”The Linköping infratunnel was installed in a greenfield site whose drawings were only finalised after the work had already begun. For this reason, the pipes and cables were only laid in the infratunnel afterwards,” Lillmals explains.

An infratunnel can also be built as a module solution. In such cases, the pipes to be housed by the tunnel are pre-installed at the factory. The pipes are connected up after the infratunnel has been set in the ground. ”A module solution speeds up installation,” affirms Vestman.

Tunnel has aroused interest

Linköping already has a new infratunnel under planning to be installed in the city centre and to run under areas including the main street. ”We aim to begin work next summer,” comments Vestman. Linköping's example has raised interest elsewhere in Sweden. Visits have been made from all over the country.

”We are currently engaged in negotiations with around ten cities, some of which would like work to begin next summer,” Christian Vestman points out.

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