The sludge created by the drilling is pumped away and the pipes in the underpass can be connected to the standard network.

How to bend a district heating pipe

In the Swedish town of Örnsköldsvik, directional drilling was used to lay large Wehotherm district heating pipe elements in 200-metre lengths below the Moälven river bed.

Over the last few years, work has been carried out in the town of Örnsköldsvik that will spare the environment and save money for the town's residents. Earlier, there were several small regional heating plants, but now heat generation for residential areas will be centralized in a large, efficient and environmentally friendly thermal power plant.

The new two-kilometre bicycle and pedestrian route was built on top of the district heating pipeline.

"We saved more than 100,000 euros of taxpayers' money compared with constructing the route separately," explains Mr Eine Ögren, Project Manager at Övik Energi.

Övik Energi built more than 4 kilometres of new district heating pipeline, which used almost 10 kilometres of district heating elements. The energy company chose the element supplier for the project themselves; after the competitive tendering process, KWH Pipe Thermopipe was selected as partner.

DIRECTIONAL DRILLING WORKS

The project was complicated because the pipeline had to cross the Moälven river. Övik Energi, together with the project consultant and other partners, considered two options: building a bridge across the river or submerging the pipe underneath the river. "We concluded that directional drilling would be the best and cheapest option. We constructed two tunnels, about 200 metres long, under the river, through which the flow and return pipes were pulled. The pipes run at least 4–5 metres underneath the river bed and at their deepest, some 20 metres below ground level," explains Mr Ögren.

Exact calculations were needed to get the large pipes to bend under the river.

"Large Wehotherm district heating elements have never before been laid at such a depth with a directional drill," explains Mr Gunnar Lärka, Sales Manager of KWH Thermopipe's Norrland region, who was in charge of the practical aspects of the delivery.

The district heating elements consist of a steel pipe surrounded by polyurethane foam as heat insulation and, on top of that, by an external PE casing. The pipes from the Vaasa factory were delivered to Örnsköldsvik in 16-metre lengths and welded together on site into two 200-metre pipes.

The two-hundred-metre-long DN300 Wehotherm district heating pipe waiting for casing joint assembly before drilling.

DISTRICT HEATING PROJECT

- ❍ Övik Energy had some 4 km of new district heating network constructed.
- ❍ The district heating pipeline connects the Själevad area to a large district heating power plant.
- ❍ At the same time, a new bicycle and pedestrian route nearly 2 km long was built on top of the pipeline.
- ❍ KWH Thermopipe supplied DN250/450 and DN300/500 Wehotherm elements.
- ❍ An underpass was built below the Moälven river. Pipes were pulled underground by directional drilling for a distance of about 200 metres. At their deepest, the pipes run 20 metres below ground level.
- ❍ The main contractor was Skanska.
- ❍ Sub-contractors were YIT Projektrör for the pipe work, Mittel for the sleeve work and Styrud Ingenjörs for the directional drilling.
- ❍ The consultants used by the developer were WSP, GC Väg and Eurocon.

"Casing joints were made with electrofusion sockets and insulated with polyurethane foam. An additional PE sleeve was shrunk onto the finished connection so that the threshold of the connecting section was as flat and smooth as possible. This made pulling the pipe into place as easy as possible," explains Mr Lärka.

CONSTRUCTING THE PIPE UNDERPASS WENT SMOOTHLY

The provincial government did not allow work to be carried out on the river between mid-August and mid-October, when migratory fish return from the headwaters to the sea for winter.

"The project started in May and continued until early December, so we were able to schedule the work so that this did not affect the timetable," says Mr Ögren.

The directional drilling, construction of the pipe tunnels and pulling the pipes through went smoothly, and only took about 10 hours.

"The work had to be well-planned because the river is much deeper on one bank than the other and there was solid rock in places below the river quite close to the bed. Taking all these factors into account we decided to make a U shape, the ends roughly 200 metres from each other. This stage of the project was carried out at the start of November," explains Mr Ögren.

The directional drilling firstly involved making two small alignment holes under the river, to ensure that the ends of both flow and return pipes came out at the right spot. Then a spray drill was sent along the directional holes. It sprayed betonite onto the mud layer to harden the edges of the tunnel. When the tunnel was ready, the long pipe was pulled into place with the drill. Finally, the heads of the pipes were connected by welding to the network on both banks.

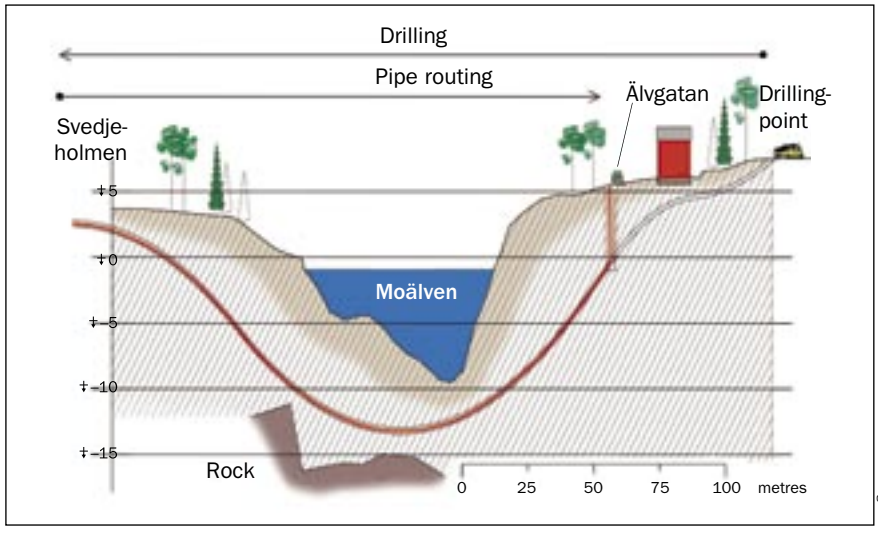
Thanks to directional drilling, no visible traces of the work were left on the banks of the Moälven river. Thus there was no need to landscape the site after the project.

YEARS OF COOPERATION

The new main pipeline, which is more than four kilometres long, cost Övik Energy some EUR 830,000. Eine Ögren thanks KWH Pipe for their first-rate cooperation.

Övik Energy and KWH Pipe began working together in 2000 and nearly 15 kilometres of pipeline from KHW Pipe's factories have been delivered to Örnsköldsvik. Work to centralize district heat production and to bring new areas into the district heating network as well as work to bring district cooling to non-residential properties continue in Örnsköldsvik.

"I believe that KWH Pipe will be involved in projects in Örnsköldsvik in the future too," said Mr Gunnar Lärka on the smooth cooperation between the companies. ●



Directional drilling under the Moälven river (scale height: length 5:1).