



wassara

**STRAIGHT
FORWARD
DRILLING**



WATER-POWERED DRILLING IN WATER-RICH FORMATION NEAR MALMÖ HARBOUR

The new concert, congress and hotel centre Malmö Live is designed to meet the toughest demands for environmental friendliness. Initially the drilling for geothermal heating was performed with air-powered DTH hammer and large amount of water was being pumped up from the ground and caused problems.

The drilling project was likely to be delayed significantly. By drilling with Wassaras water-powered DTH hammer instead, the water in the formation was not affected at all and the delay was heavily reduced.

A new concert, congress and hotel centre in Malmö, Sweden

The new Malmö Live centre in Malmö is scheduled to be opened during summer 2015. The block will comprise some 90 000 m². The congress facilities will seat 1 500 people while the concert hall will seat 1 600. The hotel will be 85 meter high, comprising over 400 rooms and a sky bar at the 25th floor.

One goal is to see the centre certified according to LEED (Leadership in Energy and Environmental Design). It consists of a suite of rating systems for high performance green buildings, homes and neighbourhoods. Malmö Live actually aims to meet the highest LEED standards, named Platinum. One of the many environmentally friendly solutions is the geothermal heating system that consists of 75 boreholes, each 280 meter deep.

Initial drilling in a very water-rich formation

Initially, the geothermal holes were drilled with air-powered DTH hammers. This soon got complicated as the Malmö formation turned out to be very water-rich. The air-powered drilling equipment quickly turned into a pumping system as the expanding air was pushing large amounts of water up the borehole when leaving the air-powered DTH hammer. Estimations indicated about 100 m³ of water being pumped up each hour. The water management system onsite could not manage this amount of water and several interruptions in drilling were required. The water also reduced the drilling performance heavily; after 3 weeks of drilling, less than 10% of the boreholes were done. The 10 weeks that was set aside for the entire drilling phase would not be sufficient. Clearly, this was not acceptable.



CASE STUDY

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Drilling with water-powered equipment in water-rich formation

The Wassara DTH hammer, W120, requires some 340 liter per minute during operation. As this equals 20m³ of water per hour, the difference is drastic. This volume is used for powering the hammer, not pumping water from the borehole. The water-powered drilling doesn't affect the water in the formation at all.

When drilling with high-pressure water, the water flows like it would in a U-formed tube (as the inner flow in the drill string goes downwards and the outer flow goes upwards in the borehole). This gives the possibility to drill in water-rich formations without problem and regardless of borehole depth.

Result:

By changing to drilling with Wassara water-powered DTH hammers, the delay of the operation was heavily reduced and the drilling phase was completed in an acceptable time frame.



The Hütte drill rig with Wassara for Malmö Live

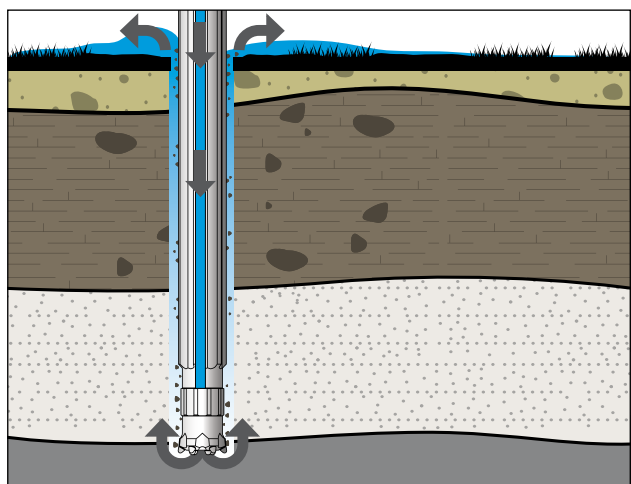


The MTD drill rig, also equipped with Wassara

Equipment used	
DTH hammer	Wassara 120
Bit	Ø 140 mm
Pump	WASP 150 Diesel
Drilling fluid	Clean water from the river
Rigs	MDT and Hütte
Borehole length	280 meters
Scope of drilling	21 000 meters
Geologic formation	Limestone



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The principles of water-powered drilling

CASE STUDY