

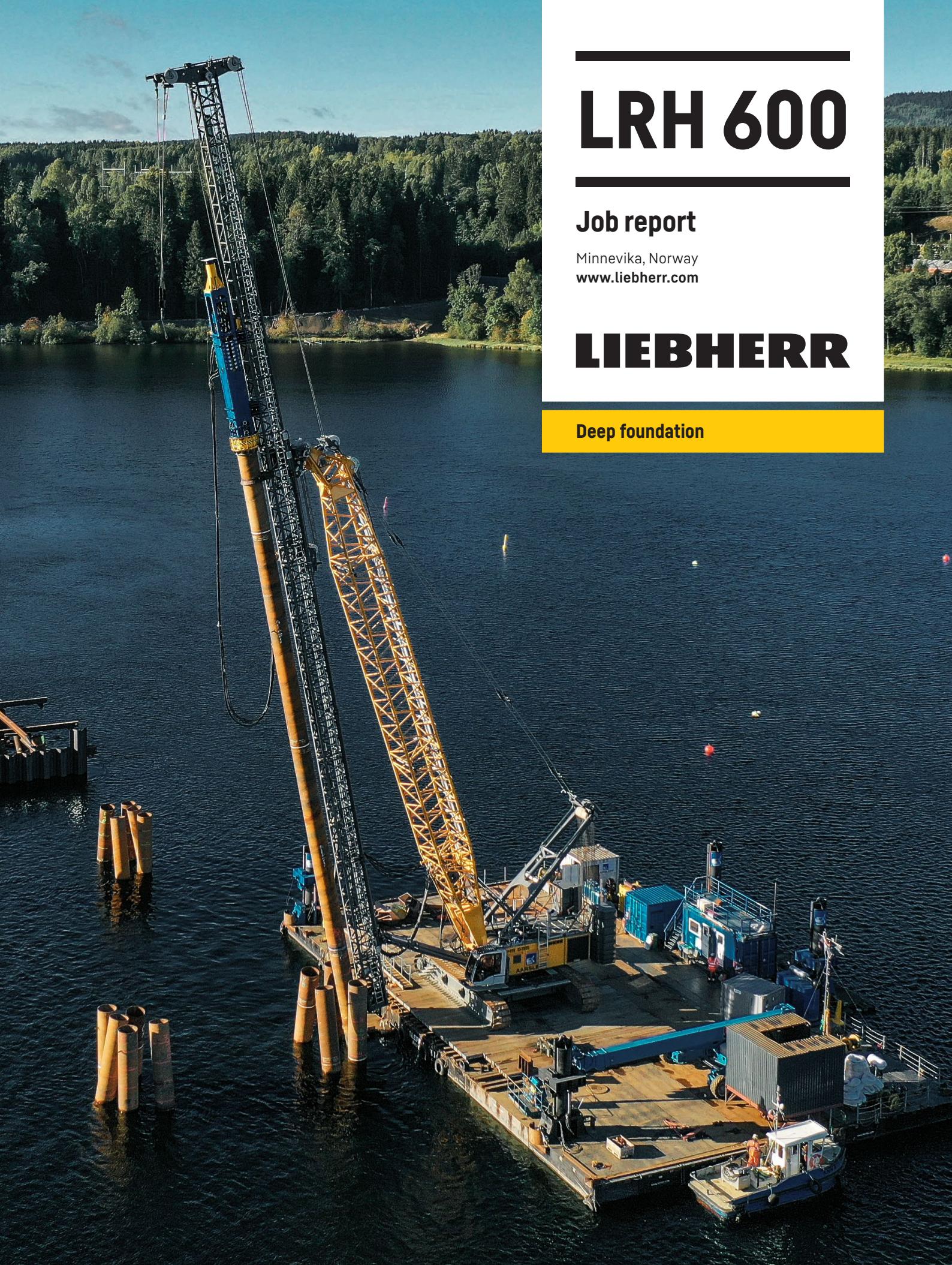
LRH 600

Job report

Minnevika, Norway
www.liebherr.com

LIEBHERR

Deep foundation



Minnevika, Norway

"Liebherr was the only supplier that could fulfil our technical requirements at short notice and deliver a carrier machine and leader as a complete package."

Dennis Jensen, Senior Project Manager, Aarsleff Ground Engineering



The challenge

The bridge in Minnevika is part of Bane NOR's large expansion of the railway system in Norway. The project will considerably shorten the travelling time between Oslo and Hamar. "Before rail traffic is permitted, the piles must rest for at least two years," explains Dennis Jensen, Senior Project Manager with Aarsleff Ground Engineering. PNC, owned by Porr, engaged the company to carry out the piling work for the foundations of the bridge.

The construction consists of 20 pier shafts with 280 friction piles, which Aarsleff has to drive into the ground. "The design challenge lay in achieving the ground bearing capacity because the rock lies so deep, therefore inclined piles were required. The project is situated in a lake, which makes the transportation of large machines and large materials much more difficult."

A question of inclination

Aarsleff is deploying the Liebherr piling rig with fixed leader system, the LRH 600, in order to complete the demanding task. "We decided for this machine because of the possible hammer sizes for inclined piles. It is very strong and stable." An important criterion emphasized by Dennis, "We have to drive in the piles with an inclination of up to 1:5 and the hammer size was an important requirement both for Aarsleff and also the capacity of the LRH 600."

In this case the duty cycle crawler crane HS 895 HD is the carrier machine. "The stability of the piling rig on the barge is surprising. Even with strong currents we can position the piles within the tolerances specified for the project in water 12-14 m deep." The steel pipes have a foundation length of 58 m, a diameter of 1016 mm and weigh 29 t each.



Animation
LRH 600

An important milestone

An advantage of the LRH 600 is that the leader can simply be inclined forwards or backwards instead of having to reposition the barge for each individual pile. The leader and the spotter are connected to the boom head via supporting tubes. This means the operator can alter the leader height without influencing the leader inclination. Higher precision in driving is achieved through the additional leader lowering device.

"The pile driving work was an important milestone for the project," says Dennis. "We achieved it eight months earlier than was planned by the client." The piles represent the foundations for the bridge across the River Vorma in Minnevika. With 836 m it will be the longest railway bridge in Norway.