

Press Release

The foundations for Norway's longest railway bridge

An extreme inclination and execution from a barge: the foundation piles for the railway bridge in Minnevikka are a challenge. The specialists from Aarsleff Ground Engineering found the right machine for the job in Liebherr's LRH series. The whole project is writing a chapter in Norway's Book of Superlatives.

Nenzing (Austria), 24 March 2021 - The bridge in Minnevikka 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. In two years, high-speed trains will travel on the stretch and sprint over this section. Although projects for the rail infrastructure are currently under way throughout the whole country, the bridge over the River Vorma is something very special.

"Before rail traffic is permitted, the piles must rest for at least two years." Dennis Jensen works as Senior Project Manager with Aarsleff Ground Engineering. PNC, which is a company owned by Porr, engaged the company to carry out the piling works 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 an inland lake, which makes the transportation of large machines and large materials much more difficult."

A question of inclination

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

In this case the duty cycle crawler crane HS 895 HD is the carrier machine. Aarsleff positioned it on a barge and is driving half the total piles into the bed of the River Vormå. “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 a weigh of 29 t.

An important milestone

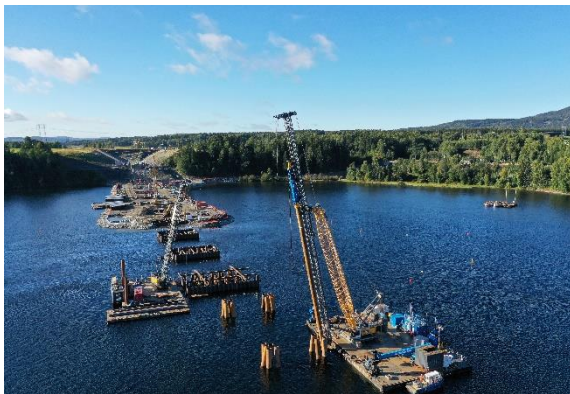
An advantage of the LRH 600 is that the leader can simply be inclined forwards or backwards instead of having to reposition the barge for each individual pile. The leader and the spotter are connected to the boom head via supporting tubes. This means the operator can alter the leader height without influencing 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 the clients milestone for pile installation.” Even more spectacular considering the interruptions due to lockdown. The piles represent the foundations for the bridge across the River Vormå in Minnevikå. It will be opened for rail traffic in autumn 2023 and, at 836 m, will be the longest railway bridge in Norway.

Animation LRH 600:

[Liebherr - New LRH 600 Piling Rig - YouTube](#)

Pictures



liebherr-aarsleff-lrh 600_1.jpg

Aarsleff drives the piles at an inclination of up to 1:5.



liebherr-aarsleff-lrh 600_2.jpg

The stability of the LRH 600 is maintained even on the jack-up barge.

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Published by:

Liebherr-Werk Nenzing GmbH

Nenzing / Austria

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