Minnevika Bridge

Customer: Teknikk AS

Location: Oslo, Norway

Products: Rapidshor, Superslim, Rapid Bar Tie, Alform Beams

Case Study

ALTRAD RMD KWIKFORM SUPPLIES TEMPORARY WORKS FOR NEW MINNEVIKA RAILWAY BRIDGE IN NORWAY

Altrad RMD Kwikform (Altrad RMDK) has supplied a temporary works solution to partner Teknikk AS to aid construction of Minnevika Bridge, the longest railway bridge in Norway, including the creation two vast concrete arches to support the structure.

Project Overview

The Minnevika bridge crosses the river Vorma right at the end of Lake Mjøsa and is situated about 80km northeast of Oslo. Spanning 836 metres across a river, it is Norway's longest railway bridge to date and is an important section of the upgraded intercity Dovre line.

For this reason, construction of the structure required careful planning with a complex design solution due to its large scale and structural demands which allowed RMDK to utilise standard equipment The construction process involved pouring two bridge arches in layers approximately 300 millimetres, over a span of 16 hours.

The Challenge

Spanning across a river posed a set of unique environmental and logistical challenges. The presence of water required the falsework and other construction equipment to be positioned in such a way that it did not obstruct the river flow or contaminate the water. This meant that all materials and supports had to be carefully placed and secured to avoid any adverse environmental impact.

Additionally, working over water increased the risk factor, requiring enhanced safety protocols and more robust construction techniques. Ensuring that contractors had clear and safe access to different parts of the construction site was critical.

The bridge design imposed a significant horizontal load on the falsework system. Traditional falsework solutions were inadequate to handle these forces without risking structural failure, so additional

Superslim raking props were used at the ends to accommodate this horizontal load. Ensuring the works could bear the horizontal stresses was crucial to maintain the stability and safety of the construction process.

Space was required between the falsework to accommodate site personnel and machine access by creating additional access allowed the program for casting the arches to stay on schedule. The falsework needed to be versatile and robust to allow gaps for the pours to take place.

The Solution

Rapidshor was used to address the high load, mainly due to its strength and versatility. This system was then supplemented with Superslim push pull props to provide additional support against horizontal loads. This combination ensured that the works could withstand the significant stresses imposed by the bridge design, maintaining stability throughout the construction process.

To prevent the construction work from overturing, Rapid Bar Ties were used to provide additional stability from high horizontal wind loads. This solution was particularly important given the presence of the river, as any instability could have had serious consequences for both the construction process and the surrounding environment.

An access tower was incorporated into the walkway design, allowing workers to safely reach the construction area. An Alform and Superslim deck was strategically placed at the top of the falsework to create this secure walkway for contractors. This solution not only facilitated safe access but also contributed to the overall stability of the project, ensuring that construction activities could proceed efficiently and safely.

By using a bespoke wall formwork solution, the team were able to adapt to the complex geometry of the arches.

The Superslim system, combined with T200 timber beams provided the strength and flexibility needed for the project. To streamline operations and enhance on-site safety, the wall formwork panels were pre-fabricated onshore, numbered and then lifted into position.

To manage the weight of the cranes and concrete pumps, an extended arm crane was used. This crane allowed the heavy equipment to be placed safely whilst pours went ahead. Strategic openings were also created in the works to facilitate this equipment. This approach ensured that the construction process could proceed without risking the stability of the falsework, maintaining safety and efficiency throughout the project.

The Minnevika Bridge is a safe and durable structure that can withstand the demands of modern transportation and environmental factors. Altrad RMD Kwikform's solutions were able to support the Teknikk construction team to meet the complex engineering challenges, while providing safety and increasing project productivity and efficiency.