Cleverly planned bridge hoist – Riga-Mainz completes a fiddly job with Liebherr LR 1600/2 crawler crane

- Railway bridge installed in constricted conditions
- Sophisticated installation concept by Riga-Mainz
- Liebherr LR 1600/2 hoists 402 tonnes using 54-metre lattice boom

Ehingen / Donau (Germany) February 2015 – The installation of a massive railway bridge in extremely constricted conditions on a precipitous site presents a whole series of challenges. A difficult crane job, fiddly and complex – just the job for Uwe Langer. The boss of Riga-Mainz completed precisely this job in Bad Wimpfen, Baden-Württemberg with his team and a Liebherr LR 1600/2 crawler crane on behalf of Deutsche Bahn – and did it beautifully.

The expansion of the municipal railway around Heilbronn was what made the construction of a new railway bridge in Bad Wimpfen necessary. However, there was very little space on the precipitous site for the crawler crane to hoist the 355-tonne steel bridge and to deliver the component. Proposals for using two cranes to position the bridge were rejected. For this solution the enormous truss construction would have had to be stored between the cranes for the duration of the set-up work. However, as the Deutsche Bahn project was already running behind, the whole thing had to be handled very quickly.

The Riga-Mainz team set up the Liebherr crawler crane on two massive reinforced concrete ramps. Company boss Uwe Langer, who was also responsible for planning the foundation, had a dozen piles driven into the site for this purpose down to a depth of up to 13 metres. After all, the ramp had to withstand a calculated crawler pressure of 507 kilonewton per square metre.

During the night before the bridge was actually hoisted the 40 metre truss construction was transported from the assembly site to the construction site on two parallel self-propelled modular transporters (SPMTs) with ten axles each. To thread the two supports for securing the handling equipment through the trusses, the experts from Mainz fitted an extension on one side of each of them. This enabled a support crane on

the other side of the bridge to handle them and draw the main support into the structure.

This was one of the smart ideas that led to Riga-Mainz being awarded the order for the work. "Riga was the only supplier to offer a solution using just one crane", explained Kathrin Gottschang from the project management team at DB Projektbau GmbH, "the concept suggested by Uwe Langer was also the only one that included threaded the cross beam through the bridge trusses." All the other suppliers would have fastened the crane at the top of the structure. That would have meant, however, that much of the work on the bridge could not have been carried out in advance of the hoisting work. "If we had had a bad winter, we would have fallen even further behind", says Gottschang. "But this meant that we reduced the winter risk to almost zero."

With the cross beam and attachment equipment the LR 1600/2 hoisted a total of 402 tonnes. The crawler crane was fitted with a total of 565 tonnes of ballast for the hoist. Slowly the crawlers reversed around ten metres until finally the bridge was positioned with pinpoint accuracy on the new abutments. Two other Liebherr cranes, an LTM 1200-5.1 and an LTF 1045-4.1, were used for set-up and support work.

Crane: Liebherr LR 1600/2

- Main boom	54 m
- Derrick boom	36 m
- Central ballast	65 t
- Slewing ballast	150 t
- Suspended ballast	350 t
- Derrick radius	18 m
- Load case	402 t at 19 m maximum radius

Captions

liebherr-lr1600-2-riga-mainz-1.jpg
402 tonnes gross load – the LR 1600/2 reverses slowly on the massive concrete ramp.

liebherr-lr1600-2-riga-mainz-2.jpg
Lord of the Axes: Thilo Fischer has been the SPMT driver at Riga-Mainz for many years.

liebherr-lr1600-2-riga-mainz-3.jpg
A unique handling concept – one of the main supports is threaded into the truss construction of the new bridge.

liebherr-lr1600-2-riga-mainz-4.jpg
The massive ramp for the crane to move on had to withstand a crawler pressure of over 500 kilonewton per square metre.

liebherr-lr1600-2-riga-mainz-5.jpg
Uwe Langer on the radio, here attaching the special cross beam.

liebherr-lr1600-2-riga-mainz-6.jpg
An impressive show: 355 tonnes of steel are manoeuvred during the night on to the SPMT. (Photo: Marcel Bauer)

liebherr-lr1600-2-riga-mainz-7.jpg
Finished! 355 tonnes of steel positioned precisely on the abutments of the future railway bridge.

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