

VSL Heavy Lifting removing old center part of the bridge and lifting new part in its place, saving existing supports.



▲ *Shifting old part of the bridge to pass through existing supports*

This historical train bridge, which crosses the Kiel Canal near Hochdonn, was opened for traffic on the first of June 1920. Since then it served to connect the city of Hamburg with the island of Sylt in the North Sea, passing the famous Hindenburg Dam. The general deterioration of the main span, but in particular damages caused by two ships collisions, made it necessary to substitute it by a new center part. The adjacent bridge spans could be refurbished to serve for future decades.

Scope of works performed

- Lowering by 40 m on a swimming dock of the old steel structure (length of 121.10m, weight of 1.465t)
- Lifting of the new structure with same length and weight
- Tilting operations to pass through existing supports by a combination of horizontal and vertical movements.

The idea was to maintain the existing support points of the main span for the new part. This meant a method had to be found to pass the old, 122m long span, through the clear gap of only 120m between supports. Once this phase was achieved, the steel structure could be lowered onto a transport barge.

This feat was realized by means of two special portal frames installed near the support axes. Each frame was held back and adjusted to the required inclination by means of 2 VSL strand units SMU 220/550. 2 strand units SMU 330/550 that were placed vertically in platforms suspended in the upper part of the frame allowed hooking up the span in 4 points. With this arrangement it was possible to move the suspended span by about 2m longitudinally and to incline it, which permitted lowering the span through the bottleneck between the supports.

On the 6th of November 2006 the old part was lifted free, shifted, inclined and lowered on a barge. 2 days later, the new part, which had arrived on another barge the night before, was lifted into place by repeating the movements in inversed manner.

▼ *Lowering on barge*



All planning design and erection activities had to be organized to meet a fixed schedule given by the railway and canal authorities.

During the train traffic disruption, a bus service assured the indispensable connections.

While lowering and lifting work was going on, this section of the canal was closed and a considerable number of ships were waiting to pass; vessels that preferred to wait rather than navigate around the Northern tip of Denmark with stormy weather in the Skagerak zone.



▲ Tilting frame

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DATE

2006

▼ Lifting of new center part



Formerly the Hochdonn railway bridge was the one that put limits to the height of the ships. Among the special features of the new construction is an increased clear height of 42m underneath the main span, to be par with the other bridges over the Kiel Canal. To achieve this increase of half a meter, the rails had to be installed directly on the steel structure.

In late autumn, weather conditions can be very rough in this part of Europe and 2006 was no exception. All parties involved in this spectacular operation had plenty of rain and wind to deal with.

▼ Detail view of connection to span



▼ New Railway lines prepared



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