



Project data

Client:

City of Bremen, represented by bremenports GmbH & Co. KG

Joint venture:

Arge Container-Terminal IV
 HOCHTIEF Construction AG
 Civil Engineering and Marine Works, Bremen
 Bilfinger Berger AG
 Strabag Hoch- und Ingenieurbau AG, Bremen
 Gustav W. Rogge GmbH & Co. KG, Bremerhaven

Project scope:

Extension of the container terminal by approx. 1.7 kilometers to a length of about 5 kilometers

Technical data:

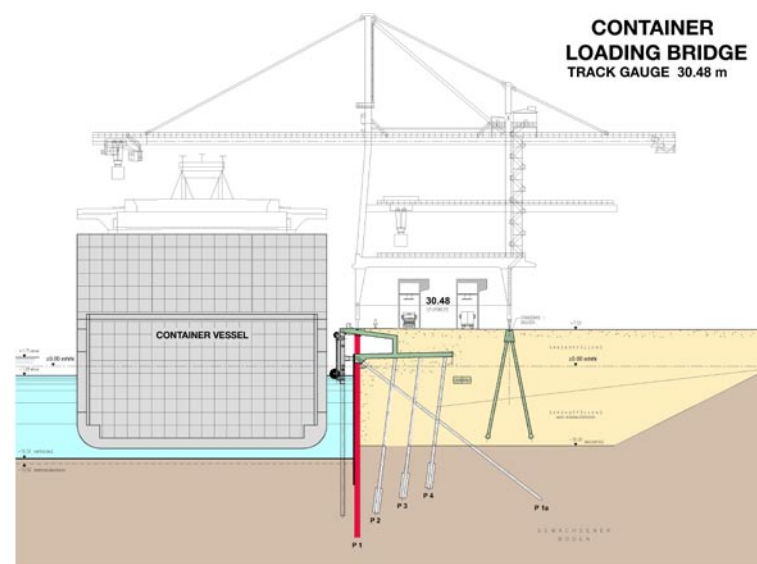
Land reclamation	900,000 m ²
Diaphragm wall steel	42,000 t
Rebars	10,000 t
Concrete	71,500 m ³
Excavation volume	13.5 million m ³

Contract volume:

approx. EUR 250 million

Construction period:

June 2004 to June 2008



HOCHTIEF Construction AG
 Civil Engineering and Marine Works

Eiffestraße 585
 20537 Hamburg
 Germany
 Telefon: +49 40 21986-0
 Telefax: +49 40 21986-200

www.hochtief-construction.com/cem
marine-works@hochtief.de

Container terminal CT IV

The quay wall of container terminal CT IV will be the longest continuous quay wall in the world. If it was possible to look down from it to the harbor bed, this would feel like standing on a 10-story building. The size of the ground is about 900,000 sqm.

Container terminal IV in Bremerhaven is a structure of superlatives, realized under the leadership of HOCHTIEF Construction AG.

By extending the existing quay wall, the city of Bremerhaven reacts to the continuing global boom in container shipping. This project is the

most ambitious and most complex extension that has ever been realized on Germany's coasts. When the last construction section is completed in 2008, the terminal will stretch five kilometers along the river Weser and provide ample space for accommodating the world's largest container vessels.

Star role for a jack-up platform

Today, the container terminal in Bremerhaven is considered to be one of the most important transshipment places world-wide. Over the last five years, the number of shipped containers has almost doubled and this growth trend is continuing. This is reason enough for another large-scale extension of the more than 3-kilometer-long structure. The framework conditions make this venture a particular challenge: located on the Weser estuary, the construction site is fully exposed to the adversities of the weather and the sea. But whatever the weather,

the task at hand demands centimeter precision in the handling of construction elements that typically weigh several tons. The quay diaphragm wall not only has to bear the weight of the huge container bridges and the cargo transported on them – it also replaces the dike and has to be able to absorb the pressure of ebb and flow.

To make the structure fit for this task, the ground was replaced on a large scale first. The soft clay-and-sea-silt ground reaching down to 19 meters into the new terminal

site was excavated over a width of 60 meters and replaced with sand. Only after completion of this step could the pile driving works for the diaphragm wall begin. At intervals of 2.31 meters, the bearing piles with a weight of up to 30 tons are driven into the ground. As the requirements placed on precision are extremely high, the pile driver has to be placed on a stable base – a star role for HOCHTIEF Construction's jack-up platform Odin. The wall is anchored by way of raked piles. Each of these 45-meter-long piles carries a load of up to 200 tons.



Special proposals for cost reduction

The bearing piles and raked piles are complemented by 1,700 piles which are driven into the new terminal ground by land pile drivers. This combination of elements provides for a complex anchoring system which, in addition to meeting all requirements, presents considerable simplifications in comparison with the originally planned model. With its special proposals, our Technical Office has significantly reduced the costs for the client.

The land reclamation works for the container storage area start in paral-

lel directly behind the diaphragm wall. This part of the terminal also presents various technical challenges: for example, the Weddewarder Tief where the surface water of the surrounding region flows into the Weser river is provided with a new bed, redirecting the river to the north of the terminal. Ten million cubic meters of sand is washed to the area between the new river course and the diaphragm wall.

For the superstructure, the tried-and-tested principle of a wave chamber at the top is applied. A

total of 71,500 cubic meters of concrete reinforced with 10,000 tons of rebars is installed for this. The concrete for the superstructure is poured jointless. To make the concrete fit for these requirements, a special mixture had to be developed.

Another task in connection with this assignment is fit-out of the quay wall. This includes the provision of bumpers as a protection between quay wall and vessels, as well as bollards where even the largest container vessels can moor.