Comprehensive Strengthening of a 90 Year-old Quay Wall at a Kiel Canal Inland Port

Inland Port Quai Wall Kiel-Wik, Kiel Canal, Kiel, Germany

Accommodating approximately 43,000 ships per year, the 99km long Kiel Canal is the world's busiest man-made waterway. It significantly accelerates shipping traffic and transportation of goods because ships do not have to take the longer route around the northern tip of Denmark. The canal is a mirror-inverted marine canal with a lock at each end. These locks protect the canal from fluctuating water levels caused by tides or wind surges. The western lock is located near Bruns - buettel on the Elbe River.

The 797m long quay wall of Kiel-Wik inland port is located at the southern bank of the canal, directly in front of the eastern lock in Kiel- Holtenau which opens towards Kieler Förde bay.
The structure was built in 1911/1912 using timber piles. An increasing infestation of piddocks boring themselves deeper and deeper into the timber caused considerable damage in the timber structure. First repairs were carried out in 1957 by adding a driven steel sheet pile wall that stabilized the timber pile structure. After a service life of over 90 years, damage caused by age and use called for a comprehensive repair and strengthening of the quay wall.

19.60m long Z-sheet piles were installed in front of the existing sheet pile wall and anchored using 30m long, Ø 63.5mm double corrosion protected *GEWI* ® piles. In addition, the *GEWI* ® piles, which were divided into two parts, were furnished with a plastic tube encasing the upper 15m. Thus, transmission of forces from the injection piles onto the old timber pile foundation could be avoided and forces were directly transferred to the boulder clay underneath. Drilling through the 50 year-old original rammed sheet pile wall at 17m below ground level was the biggest challenge during this project.

Reference Details

Owner Northern Authority of Water and Navigation (WSA Luebeck), Germany +++ **General Contractor** Consortium consisting of F + Z Baugesellschaft mbH, Hamburg, and Heinrich Hirdes GmbH, Kiel, Germany +++ **Subcontractor** Neidhardt Grundbau GmbH, Hamburg, Germany

DSI Unit SUSPA-DSI GmbH, LU West, Langenfeld, Germany
SUSPA-DSI Scope Supply of 190 pieces of 30m long, double corrosion protected Ø63.5mm *GEWI* ® Piles

for more information please call: + 49.89.309050.200 **or fax:** + 49.89.309050.252 **or e-mail: DSI Munich**