



Client: AKZO-NOBEL
Main contractor: Hollandse Beton- en Waterbouw bv
Machine: CBC
Tubes: RC with sheet steel core
ID-OD: 2.000—2.370 mm
Length: 370 m
Execution: 1997

For the benefit of a new heat and power station, a complete circuit was built that allows to extract water from the seaport canal and discharge into the North Sea after use. The drain DN 2000 mm was jacked by Smet-Tunnelling starting from a sheet pile shaft on landside under the seaport canal and the wing wall towards a sheet pile shaft at sea. Up there, the shield was recovered with a crane on a pontoon.

Longitudinal profile

The starting point was a shallow jacking shaft, under a gradient of 10 degrees (DEG) with the vertical surface. The length of this part was 32 m. Then, a vertical curve with a radius of 750 m was followed for 195 m in order to end in a straight part of the tracé (length 140 m) with a vertical gradient of 5 degrees (DEG). The total length of the jacking is 367 m. At the deepest point, the soil cover is 18.75 m. In order to withstand jacking forces, these are diverted to the underwater concrete in the jacking shaft by means of a pulling frame. Grouting blocks at departure and arrival shafts provided a stable opening and a sufficient seal on the shield. The ground consisted of soft clay, peat and sand. The main part of the jacking was however located in solid clay. Due to the vertical curve, the shield had to be adapted in order to drill through all these layers, which additionally increased the difficulty level of this job.

Guiding system

By using a patented guiding system that consists of computer guided fully automated theodolites, the absolute and relative position of the shield is known at all times. These deviations are communicated to the operator to execute the necessary steering corrections.

Jacking pipes

The jacking pipes are made of reinforced concrete with a steel core. The internal diameter is 2000 mm, the external diameter 2370 mm and the thickness of the steelcore is 6 mm. Each pipe is 3.3 m long and is provided with 3 injection-holes diameter 1". The three necessary intermediate jacking stations are designed by Smet-Tunnelling in cooperation with the pipe supplier.



CBC Shield

Owing to the fact that the jacking took place below groundwater level, the use of a closed-front shield was necessary. The used CBC shield is designed and constructed by Smet-Boring in cooperation with Smet-Tunnelling. In consultation with Smet-Tunnelling, specific modifications were made for this job, so that monitoring and jacking was possible through all the expected soil layers. Thanks to the modifications, the shield remained controllable in peat and the heavy clay could be broken off efficiently.

