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4. Berendrecht Sea Lock, Antwerp (Belgium)

Owner:	*Ministry of Public Works – Waterways Department*
Engineers:	*Constructor – Antwerp* *S.W.K. – Ghent* *T.K.B. – Antwerp* *Tractebel – Brussels*
Contractors:	*C.F.E. – Brussels*
Joint Venture Civil Works:	*Jan de Nul – Aalst* *M.B.G. – Antwerp* *S.B.B.M. Brussels* *van Laere – Burcht*
Joint Venture Lock Gates:	*Buyck – Eeklo* *Boel – Temse*
Works Duration:	*78 months*
Service Date:	*April 1989*

General

The constant growth of traffic in Antwerp made it necessary to increase the number of locks giving access to the docks on the right bank of the Scheldt River.

Moreover, the considerable amelioration of navigability on that river required improving the facilities for ships of greater draught and beam which are entering the port of Antwerp.

So it was decided to construct the Berendrecht Lock, the biggest in the world, next to the existing Zandvliet Lock, 20 kilometers downstream from the city center.

Layout

The general layout and the working principles of the Berendrecht Lock are quite similar to the Zandvliet Lock, but due to the existing structures in the neighbourhood, it was necessary to use some special techniques.

Particularities

1. As the lock was executed under dry conditions a watertight cement-bentonite curtain (n° 1 on the figure 1) was built between the lock and existing factories. Moreover, it was necessary to install a computer-controlled refeeding system to avoid differential settlements.
2. The demolition of 70 000m³ reinforced concrete was carried out under water by means of explosives. Therefore, more than 100 tons of dynamite has been used according to the results of a large scale monitored campaing of test explosions in the field.

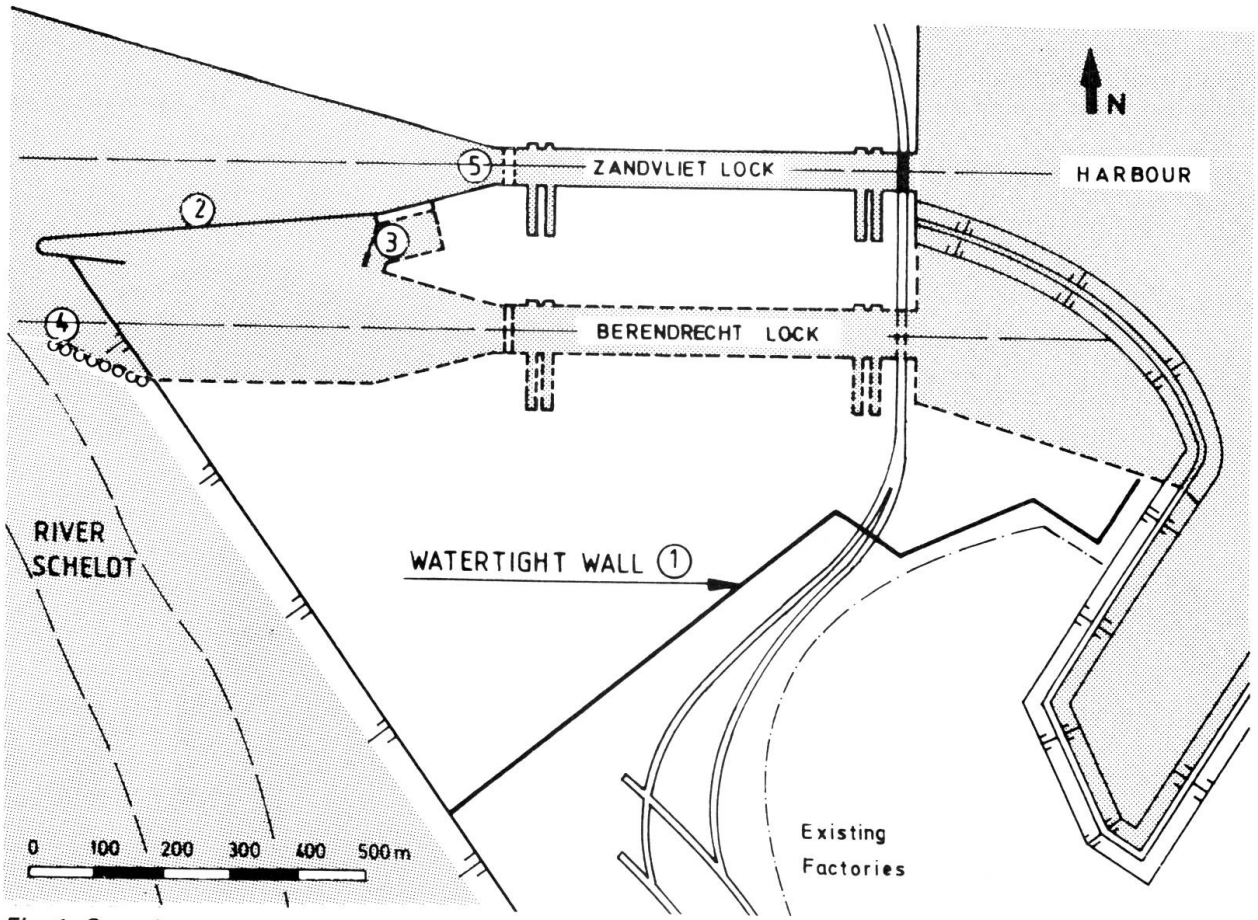

Fig. 1: Overview

Fig. 2: General view

3. Due to the proximity of water and existing old quay walls, near to the dock between the two locks, a special design of a quay with slurry walls has been executed. In order to assure ground and watertigthness, the technique used was the hydromill.
4. In the Scheldt River the Pier end has been constructed with the sinking (in dry conditions again) of 8 adjacent caissons 24 m deep with a 19 meter external diameter. This operation was so successful that two years later the same technique was adopted to construct the Container quay, south of the lock, consisting of 46 caissons with a 29 meter external diameter. After demolition, the concrete blocks have been crushed and the materials were used in the new concrete for the Berendrecht Lock.
5. The 1200 tons bridge over the existing Zandvliet Lock has been lifted and positioned as a whole with floating cranes. Afterwards axle and jacks were coupled, counterweight was filled up and the bridge was opened. All these operations were carried out during a 40 hours traffic interruption in the Zandvliet Lock.

Quantities

Dry excavation works: 4.2 millions m^3
Dredging works: 4.8 millions m^3
Concrete: 730 000 m^3
Reinforcing steel: 22 000 tons
Steel for the bridges: 6500 tons
Steel for the gates: 6200 tons

(D. Morlion)