

Westerschelde

Logistics systems: Year of construction 1999



Intermediate stockyard with lining segment trans-boarding car



The lining segment feeder car takes the linings from the intermediate stockyards, turns them by 90 degrees and hands them over to the erector

About the project

The project concerns the construction of a road tunnel, consisting of two parallel tubes under the Westerschelde between Terneuzen and South Beveland and connecting the R4 from Gent with the A58.

The inclination at both tunnel entries is 4,5 %. In between, the tunnel is practically horizontal.

Project details

Country:	Netherlands
Plant owner:	KMW Westerschelde, NL - 4530 Terneuzen
Contractor:	Herrenknecht AG, D - 77963 Schwanau
Demand of the owner:	Construction of a double motorway tunnel
Demand to Rowa:	Engineering and production of a high-performance back-up system allowing to keep the tunnel floor free for technical finishing works
Task of the back-up system:	Logistic solution for the supply and removal at all the work places



Back-up platform with lateral supports

Westerschelde

About the logistics system

Work to be carried out within the back-up system: Transloading and stocking of the lining segments, transfer of the lining segments to the erector, in the lower part transloading and displacing of the cable channel elements, as well as transloading of the maintenance material and mounting, dismounting and transloading of the supporting elements of the back-up train 2.

The back-up system was designed in a way to form two main parts, divided according to their functions. The upper part is used for the transloading of the lining segments, the lower part for the placing of the bottom segments. In order to keep the bottom area completely free for the installation work, the platform cars are supported laterally on the lining segments. The specially designed supporting system transfers the charges of the platform cars alternately to the right and to the left side, through conical bolts onto the lining. On both sides a mounting and a dismounting device are installed, taking care of the mounting, dismounting and transportation of the supporting system. The supporting elements are continuously dismounted in the area of the back-up system 3 and transported to the rear of the back-up system 1, there to be re-installed. The elements are accompanied by a driver, who is responsible for the handling operations.

Times available for an advance of 2 m:

Boring stroke:	50 minutes
Placing of lining elements:	30 minutes
Measuring:	10 minutes max.
Discharging time (change of train)	25 minutes

The average daily performance corresponds to 16 - 20 m per workday. The back-up system is designed to cope not only with average performances but with a possible peak performance of 25 m per day.

Supply and removal logistics

The removal is operated hydraulically, while the rail operations are used exclusively for supply. A lining segment train and a supply train are on their way alternately for the feeding of the tunnel heading areas. Each lining segment train is transporting one complete lining ring, each supply train a cable channel element with the corresponding material for the bottom construction.

The back-up train 2 consists of 14 stable platform cars with integrated material transloading cranes, designed as area cranes. These are suspended underneath the back-up train 2. The material transloading crane 1 is used for the unloading of the cable channel elements, which are turned by 90 degrees and then placed at the tunnel bottom. This crane is also used for the transloading of the material for the bottom construction and for the feeding of the different workplaces. The material transloading crane 2 carries out the transportation of the containers filled with rubble, empties them at the appropriate workplace or places them at the side of the train for intermediate storage. The cranes are operated by radio control.

The lining segment car can be moved longitudinal on the back-up trains 1 and 2. It takes the lining segments from the intermediate stockyard on the back-up train 2 during the unloading and transports them onto the back-up train 1. During the placing of the lining segments, it takes them from the intermediate stockyard on the back-up train 1, turns them by 90 degrees and hands them over to the erector. The whole process is operated from the control panel.

Technical details of the tunnel

Tunnel length:	2 x 6'600 m
Outbreak diameter:	11,24 m
Outbreak area:	99,20 m ²
Finished diameter	10,10 m

Scope of delivery

- Supporting consoles for back-up trains 2 + 3
- Back-up train 2
- Mounting and dismounting platform for the supporting consoles
- Lining segment feeder car
- Lining segment transboarding car
- Material transboarding crane 1
- Material transboarding crane 1