

PROJECT

TUNNEL LIEFKENSHOEK BELGIUM



PROJECT NAME

6 Km long double tube railway tunnel as new east-west connection for freight trains within the port of Antwerp in Belgium.

CLIENT

INFRABEL NV

ENGINEER

Ingenieurgesellschaft VEPRO-FANGER Berlin

GENERAL CONTRACTOR

Joint Venture THV Locobouw
Wayss&Freytag AG, VINCI SaS,
CEI-De Meyer NV, MBG/CFE NV

SPECIALIST CONTRACTOR

RODIO GmbH Spezialtiefbau

CONTRACT VALUE

EURO 5,6 Mio CHF 7,3 Mio

BEGINNING OF WORKS

APRIL 2010

END OF WORKS

MARCH 2012 (foreseen)

■ JOB DESCRIPTION

Freezing of soil by the so-called indirect method (BRINE FREEZING) as temporary support structure for 13 cross-passages and the connection with an emergency exit shaft. The main tunnel were excavated with two Mix shield Herrenknecht TBMs. Each TBM has a diameter of about 8.4 m. The cross passages lye in fine, sandy to silty layers and are located 20 to 40 m below water level. In the four lowest locations, the main tunnels partially enter into the base clay. The holes for the installation of pipes freezing and thermometers were installed against water pressure from the southern tube using special Preventers (BOP) to avoid uncontrolled water and soil losses. Since the second half of the tunnel had to be kept free to tunnels construction traffic during all drilling and freezing activities, a special holding and movement system for the drill rig had to be studied and constructed. The drill rig could move along a vertical mast that was running on two tracks and was able to reach all the drilling positions and inclinations.

■ WORK QUANTITIES

740 drill holes, drill depth: 5 to 13 m. Total drilled length: 5.500 m

The total Volume of frozen ground is 3.650 m³

640 freezing pipes, 60 Thermometer Chains with a total quantity of 380 measuring points.

■ MAIN EQUIPMENT

1 Drill rig EGT VD 500 mounted on a vertical hydraulic mast

1 Mixing and Grouting plant

2 Freezing plants with a power of 250 KW each at -35 °C

2 Freezing plants with a power of 100 KW each at -35 °C

Drilling Parameter Recording by means of LUTZ LT3 system



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Ground Freezing



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Drill rig mounted on a vertical hydraulic mast



Brine distribution circuit and propping structure



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