



### PROJECT NAME

Road tunnel along the national road L386 between Wassenaar and The Hague (Holland)

### CLIENT

Municipality of The Hague (Holland)

### ENGINEER

Underground Works Department of The Hague

### GENERAL CONTRACTOR

Joint Venture HUBERTUS TUNNEL  
Wayss&Freytag AG, BAM Civiel bv,  
Van Hattum en Blankevoort bv

### SPECIALIST CONTRACTOR

Joint Venture RODIO HUBERTUS TUNNEL  
**RODIO** Geotechnik AG  
**RODIO** GmbH Spezialtiefbau

### CONTRACT VALUE

EURO 1,8 Mio CHF 3,0 Mio

### BEGINNING OF WORKS

APRIL 2007

### END OF WORKS

NOVEMBER 2007

### JOB DESCRIPTION

Ground freezing by means of the so called indirect method (Brine Freezing) for the excavation of 5 cross passages between the two main tunnels, spaced 250 m from each other. The cross passages are situated 10 to 15 m below water table. The ground is very fine and soft and is made by fine sands with silt bands. The holes for the installation of the thermometer and freezing pipes have been performed starting from the south tunnel using special preventer (BOP) to avoid uncontrolled discharge of soil and water inside the main tunnel. The freezing pipes were introduced directly into the ground as lost drill pipes made of special steel for low temperatures. The drill rig was mounted on a hydraulic scissor platform.

### WORK QUANTITIES

110 drill holes, drill depth: 5 to 9 m. Total drilled length: 800 m  
The total Volume of frozen ground is 1.200 m<sup>3</sup>  
100 freezing pipes, 10 Thermometer Chains with a total quantity of 80 measuring points.

### MAIN EQUIPMENT

1 Drill rig EGT VD 500 mounted on an hydraulic scissor Platform  
1 Mixing and Grouting plant  
2 Freezing plants VLTC 350 with a power of 105 KW each at -35 ° C  
2 Freezing plants WCC 200 with a cooling capacity of 200 kW each for the pre-cooling of water at +6 ° C  
Drilling Parameter Recording by means of LUTZ LT3 system



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# Ground Freezing



PROJECT

## HUBERTUS TUNNEL



Platform mounted drill rig on a cross passage



Excavated Cross Passage with exposed frozen walls



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Ground Freezing