

PROJECT

## NORRA LÄNKEN LOT 51 SWEDEN TUNNEL VÄRTAN JET GROUTING



### PROJECT NAME

Norra Länken Stockholm  
Tunnel Värtan water tightening of moraine soil against base rock by means of Jet Grouting

### CLIENT

VÄGVERKET SWEDEN

### ENGINEER

VÄGVERKET

### GENERAL CONTRACTOR

HOT Joint Venture  
Hochtief AG HODEN AB

### SPECIALIST CONTRACTOR

RODIO Geotechnik AG

### CONTRACT VALUE

EURO 1.20 Mio. CHF 1.92 Mio.

### BEGINNING OF WORKS

June 2008

### END OF WORKS

October 2008

### ■ JOB DESCRIPTION

The Värtan tunnel, as a part of the new northern road bypass of Stockholm (The Norra Länken) it's an open pit, partly crossing soft soils, between two rock tunnels. The performance of Rodio includes the execution of Jet Grouting vertical columns (1.60 m) for the water tightening of the soil (moraine) between the foot of the sheet pile wall and the sheet rock (hard granite). Before starting with Jet grouting, every second sheet pile, a steel pipe (140 mm) had been welded to the sheet pile and rammed together just before the top of rock. The soil is generally made by soft to half compact clay, the so called Lera. The last 2-3 meters above the base rock are made of high permeable sandy gravels (friction moraine). The bottom of excavations lies on some extent a few meters under the foot of the sheet piles. The purpose of the Jet Grouting is not only water tightening but also the strengthening of the loose soil up to the rock. To achieve the required column diameter of 1.60 m, here the DUPLEX Jet Grouting method (RODINJET 2®) was chosen. Following this method, the high-pressure cement grout jet that cuts the soil, is coated by an air jet to increase its action radius.

### ■ WORK QUANTITIES

A total of 2.000 Meter of vertical jet grouting columns Ø 1.60m



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### ■ MAIN EQUIPMENT

1 Drill rig Casagrande C8 Super

1 full automatic mixing plant type MA 004

1 high pressure pump type Techniwell TW 400

1 Air compressor Atlas Copco XAHS 365

Full automatic recording of drilling and jet grouting parameters by means of LT3 LUTZ System.



Casagrande C8 Super drill rig at work



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