

Horizontal Directional Drilling



A new record in Hong Kong was set by Intrafor’s team by achieving 1,151.5m of horizontal directional drilling

The Eagle’s Nest Tunnel is the longest tunnel of the Route 8 project, which extends from Shatin to Cheung Sha Wan.

The tunnel is built by the ‘Drill and Blast’ method with a very stringent requirement on control of water inflow during the excavation stage.

It is therefore of vital importance to know in advance the locations of faults, large fissures with soft infilling materials as well as the ground water flow regimes.

Two long horizontal drillholes were specified in order to investigate the geological and hydrogeological information along the tunnel alignment. One at the North Portal (1,150m) and one at the South Portal (950m).

The main challenge is to guide these two drillholes, in both Azimuth and Inclination within the specified tolerances. In order to meet the contract specification and programme of works, directional drilling and wireline coring techniques were used together with real time monitoring of the water flow.



The Geology



The Water Flow

Horizontal Directional Drilling

SCOPE OF WORKS

- Drilling of two horizontal directionally guided fully cored drillholes
 - ↳ One at the North Portal: 1,150m long with inclination of +1%.
 - ↳ One at the South Portal: 950m long with inclination of +1% to +4% to avoid two existing structures.
 - ↳ Tolerance envelope is a semi-circle with 8m radius.
- Tests
 - ↳ Real time net outflow monitoring.
 - ↳ Packer water outflow tests, deepest at 900m.
 - ↳ Water pressure head tests.
- Grouting
 - ↳ Pressure grouting at required length of drillholes.
 - ↳ Backfilling both holes at completion of works.
- Construction Period
March 2004 ~ February 2005



Main Quantities

Drilling	:	1,250m (Unguided)
	:	850m (Guided)
Hole Profile Surveys	:	42 nr.
Packer Outflow Tests	:	4 nr.
Packer Pressure Head Tests	:	2 nr.
Unrestricted Outflow Tests	:	3 nr.
Grouting / Backfilling	:	30 m ³

CLIENT :
HKSAR Highways Department

TUNNELLING ENGINEER :
IMS Tunnel Consultancy

MAIN CONTRACT ENGINEER :
Maunsell-Hyder Joint Venture

MAIN CONTRACTOR :
Leighton-Kumagai Joint Venture

**DIRECTIONAL DRILLING
SPECIALIST :**
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