



Uma Oya Multipurpose Development Project (LK) Grouting Tunnel

Employer	Ministry of Mahaweli Development & Environment, Sri Lanka
Client	Farab Company, Energy & Water Projects
Execution of works	Renesco GmbH, Abt. Marti Geotechnik
Designer	Amberg Engineering AG
Construction Period	May - November 2015
Contract Sum (grouting only)	€ 3.500.000

Project Description

The Uma Oya Multipurpose Development Project in the south-east of Sri Lanka serves the combined aims of power generation, irrigation and water supply improvement. The necessary works include two dams, a 15 km long headrace tunnel and a 3.6 km long tailrace tunnel. After approximately 3 km of the TBM drive for the headrace tunnel, water started to infiltrate into the tunnel at a rate of around 370 l/s. This led to the lowering of the water table, as well as drying-up of village wells in the immediate neighborhood. The drive consequently had to be suspended. As a premise for the resumption of works, the authorities demanded a significant lowering of the water inflow into the tunnel.

Grouting works

Due to the urgency of the situation 40 tons of equipment and materials were shipped to Sri Lanka by air freight within 6 weeks. The mixing and injection system was converted for track operation and the drill rig was installed on a platform. The works included systematic cement grouting of the annular gap and rock mass grouting over a length of 560 m. Additional chemical injections with polyurethane were carried out at locations subjected to particularly heavy water ingress. The high pressure required a specially fabricated packer to ensure successful grouting. When, in December 2015, the overall water infiltration rate fell below 20 l/s, the authorities approved the resumption of the works again.

Scope of work

- Pea gravel grouting: 3 440 holes

Rock mass grouting

- Boreholes: l=3 m, 1 700 nos.

- Cementous grout: 440 000 l

- Polyurethane resin: approx. 10 000 kg

- Silicate foam: approx. 5 000 kg

Due to the application of special anti washout additives the main part of the works could be executed by using economic cementitious grouts.



1. Job site installations at portal
2. Grouting pumps and mixer in the tunnel
3. Installation of packers