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INJECTIONS & GROUTING

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Passion | Technology | Trust

Renesco is a leading international company, specialized in the field of structural waterproofing and injections/grouting services.

Established in 1965, Renesco is part of the Marti Group in Switzerland, an owner-operated family business that specializes in underground construction.

Marti is a multi-disciplined organization with services that range from building transportation tunnels as a contractor of record to performing specialty underground services on a subcontract basis through its wholly-owned Renesco Group subsidiary.

Renesco provides all kind of specialty services for sealing operations in underground structures against pressurized and non-pressurized water, as well as injection/grouting works. Main areas of application include national and international large-scale projects in tunneling and infrastructure, as well as in the hydraulic, environmental and rehabilitation sectors.

INJECTIONS & GROUTING

Renesco has become an international leader in specialty grouting services. The company currently has operating several divisions in different countries and we have ongoing projects in many more.

- Organic Grouting (acrylate, polyurethane, silicate, etc.)
- Cement grouting (normal, microfine, hybrid cement)
- Ground stabilization and compaction grouting
- Grout curtain, permeation and contact grouting
- Concrete rehabilitation
- Specialized drilling services for tunnels, shafts, hydraulic and civil structures
- Digital data management

Our reputation as a company has been built on providing tailor-made, practical-oriented and cost effective solutions and we have the right mix of skilled people, resources and expertise required to make your next project a success.

TUNNEL FEUERBACH
SEALING GROUTING

Object description

As part of the project Stuttgart 21 the new Feuerbach tunnel connects the Stuttgart main station and the train station of Feuerbach. All works are executed via a central access tunnel during the entire construction period. The railway tunnel consists of two separate tunnels each with a length of about 3 200 m..

Injection/Grouting works

The tunnel lies partially within an anhydrite formation with a swelling potential when in contact with water. Many tunnels in the past have suffered considerable damage due to the apparent swelling processes. To inhibit swelling water is completely restricted for construction.

The water-bearing ground formations were additionally grouted with polyurethane resin during the course of the tunnel driving through pre-excavation drilling holes. Subsequently, the excavation-damaged zones in the anhydrite zones are systematically grouted with acrylate gel.

Scope of work

Construction time: Since November 2015

Pre-excavation grouting:

- Polyurethane resin: approx. 230 000 l

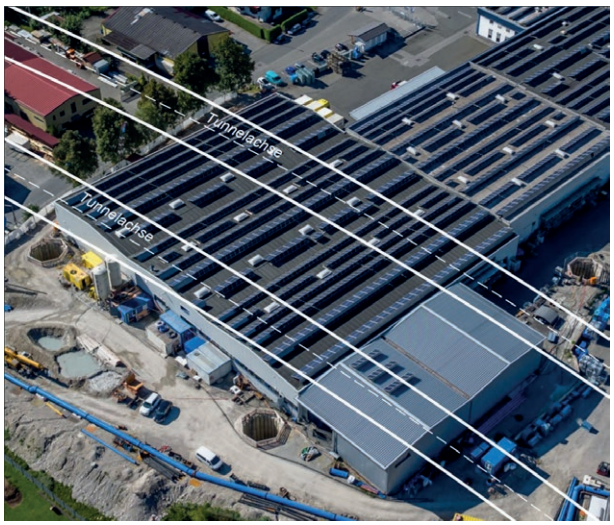
Systematic Grouting:

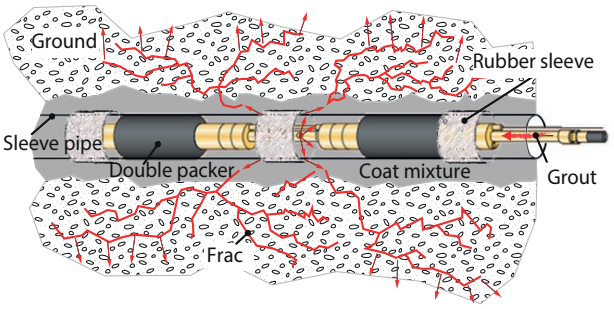
- Drill holes: approx. 60 000 nos.
- Injections: 120 000 nos.
- Acrylate gel: 2 300 000 l

Particularities

For the first time in grouting technology, a digital grouting data management system was introduced for monitoring, documenting and steering of the grouting operation. The system in place allows instant access to the grouting data, automated quantity survey and interactive visualization, as well as accurate documentation of construction sub-operations.

A grouting container with fully automatic, pump control, acrylate gel pumps and chemical-resistant measuring sensors as well as a semi-automatic mixing plant, ensures the quality of the works.





TUNNEL OBERAU
COMPENSATION GROUTING

Project Description

The 3 km long twin-tube Oberau Bypass tunnel is the longest road tunnel in the state of Bavaria and crosses two mountain ranges, as well as the Gießenbach valley which is characterised by fluvial deposits. With an overburden of only 10 m and sensitive industrial buildings on top of the tunnel alignment, the project called for over 7 700 m² of compensation grouting as a mitigating measure to counteract the settlements caused by the tunnelling.

Grouting works

By carrying out pre-heave and interim heave grouting, it was possible to compensate the settlement caused by tunnelling operations, without any damage to the buildings or interruption of the tunnelling works.

The digitization of the machine and measurement data and the digitalization through a web-based grouting data management system, enabled a modern and agile project management and ensured the successful execution of the works.

Scope of work

Construction time: January 2016 – November 2017

- Construction of 6 shafts

Drilling

- Drill holes for sleeve pipes: 7 730 m
- Drill holes for inclinometer: 470 m
- maximum drilling length of 53 m
- Area of compensation grouting: 7 700 m²

Grouting

- Cementous Grout: 1 650 000 l
- Sleeve valves: 12 500 nos.
- Grouting time: 6 500 h
- Injections: 36 500 nos.

Alignement of deformations

- Hose cart system: 116 nos.
- Horizontal inclinometers: 5 nos.

UMA OYA
MULTIPURPOSE DEVELOPMENT PROJECT
GROUTING TUNNEL

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

Construction time: May - November 2015

- 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.

PUMP STORAGE PLANT NANT DE DRANCE SHAFT GROUTING

Project Description

The 900 MW Nant de Drance pumped storage station was built near the French border in the Swiss Canton of Wallis. Centerpieces of the project are the 190 m long and 52 m wide machine caverns, the pressure water tunnels and two vertical shafts with breakout diameters of 8.20 m, internal diameters of 7 m and depths of 403 m each.

Scope of works

- Construction time: 2013 - 2014

Systematic contact grouting over the entire shaft height:

- Boreholes: approx. 1 200 in each shaft
- Borehole depth: up to 30 cm into the rock

Consolidation grouting area by area, depending on geology:

- Boreholes: approx. 450 per shaft
- Borehole depth: up to 12 m into the rock

Grouting concept

- Distance of grout rings: 3 m
- Boreholes per grout ring: 8 nos.
- Primary and secondary boreholes
- Primary and secondary rings

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