KORALM TUNNEL - CL KAT2

3G Gruppe Geotechnik Graz ZT GmbH

PROJECT DESCRIPTION

The Koralm Tunnel, located between the two Austrian federal capitals of Graz and Klagenfurt, is the core of the Pontebbana axis. The Pontebbana axis is a high capacity railway line, linking North-eastern Europe with the Mediterranean region.

The Koralm tunnel project consists of three construction lots: KAT1, KAT2 and KAT3.

The tunnel cuts through the Koralpe mountain range and parts of the neighbouring Neogen basins.

The Koralm Tunnel is a double-tube, single-track railway tunnel, length of CL KAT2: approx. 20 km, maximum overburden: 1,200 m.

CL KAT2 was started in 2010.

- Two overlapping construction shafts. The 60 m deep shafts were constructed from February to August 2011, providing access to NATM and TBM tunnels of CL KAT2
- Exploration shaft Leibenfeld is used for ventilation and personnel elevators to the tunnel headings of CL KAT2
- Neogen sediments are excavated by NATM. This part of the tunnel has a length per tube of 1,8 km and 2,5 km. At the start of hard rock section assembling caverns for both TBM are situated. Installation caverns were excavated applying NATM technology with a cross sectional area of 380 m² each.
- The metamorphic rocks of the Koralpe are excavated with 2 single shield hard rock TBM, outer diameter 9.9 m. This part of CL KAT2 has a length of 15,7 km and 17,2 km respectively.
- Tunnel tubes are connected by 39 cross passages and 1 rescue tunnel, all excavated by NATM. The rescue tunnel has a total length of 950 m and a cross section of 62 m²
- The excavated metamorphic rocks are processed at the construction site and used as aggregates for production of segmental lining elements.

View of the site installation area of the Koralmtunnel KAT2

View of the NATM tunnel with the exploratory tunnel © 3G

GROUND CONDITION

The north-south trending mountain range Koralpe is part of the Koriden unit within the Middle-Austroalpine nappe complex of the Eastern Alps. Typical occurring rock types are polymetamorphic mica-schist and gneiss, quartzite, calcareous-silicate rock, marble, amphibolite, eclogite, and abundant pegmatite veins.

The Koralpe is bordered to the East by Neogen sediments of the Styrian Basin (part of the Pannonian Basin system) and to

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the West by Neogen sediments of the Lavanttal Basin.

3G Tasks

- Site supervision for NATM and TBM tunnel sections
- Engineering geological and hydrogeological documentation
- Support and evaluation of investigation applied systematically ahead of the lead TBM (geophysical exploration, percussion drilling), preparation of short term ground predictions
- Geotechnical consulting during construction for excavation concepts, processing of excavated materials, claim defence

Key Data

Project:

- Single-track double-tube railway tunnel, length of construction lot: approx. 20 km
- Tunnel excavation trough two temporary shafts, depth 60 m and cross section 150 m² per shaft

View of the cross shaft with NATM tunnel of the Koralmtunnel KAT2

- NATM tunnels, length: approx. 2,2 km each, support with primary lining and permanent lining (cast insitu concrete)
- TBM Tunnel with 2 hard rock single shield TBM, Length: approx. 17,5 km each tube, excavation diameter: 9,9 m. inner diameter: 8,0 m., excavation cross section: approx. 80 m², support with segmental lining and concrete inner lining in sections only

Type of Project:
Consultancies during design and construction (geology, geotechnics, tunnel design), design check, site supervision, documentation

Location:
Styria, Deutschlandsberg, Austria

Period of 3G Tasks:
Since 2010

Client and Owner:
ÖBB – Infrastruktur AG, Projektleitung Koralmbahn

TBM in assembling chamber South(KAT2) *© ÖBB*