



## KORALM, GRAZ - KLAGENFURT RAILWAY LINE, KORALM TUNNEL, KAT 1 CONTRACT SECTION

Client: ÖBB-Infrastruktur AG (Austrian Railways Infrastructure AG)  
Development Period: since 1996

### THE PROJECT

The contract section KAT 1 of the Koralm Tunnel constitutes the eastern part of the three tunnel sections and includes an open land route with a length of 3.2 km and four bridges, a 300 m long tunnel section, built with the cut-and-cover method, and a tunnel section (length 2.0 km) using the mining technique.

Besides the tunnel advance and the foundation of the bridges, the extensive earth moving measures in the open land section as well as the securing measures for the building pits by means of bored piles or anchored shotcrete in the cut-and-cover section are of geotechnical importance.

### OUR FUNCTION

BGG Consult attends to this project section with regard to the subjects geotechnics, hydrogeology and geology since the feasibility evaluation phase. Based on several subsoil exploration campaigns, expert's reports were compiled for the route selection procedure, the environmental impact study, the permission procedure, and the tendering phase.

During construction, a supervision in the field of geotechnics and hydrogeology is conducted. This includes, among others, the documentation, monitoring and supervision of the bored pile works, the optimizations of the foundations and slope securing measures, the oversight of the extended earth works and the monitoring of the slopes and bored pile walls by means of geodetic measuring and inclinometers.

### *Building Pit Securing Measures Cut-and-Cover Section Koralm Tunnel:*

The building pit for the tunnel section built with the cut-and-cover method features depths up to 20 m. To a great extent, the slopes to be secured consist of cover sediments. These materials are characterised by a low shear strength and a high susceptibility to sliding. The miocene rock below is also classified as instable due to fine-grained, cohesive intermediate layers, slickensides and the confined ground water.

In order to avoid very high slope cuts and to minimize the geotechnical risks, the slopes in the area of the deeper cuts have been secured by anchored bored pile walls (partly anchored in multiple levels) or shotcrete walls.



*View towards the eastern portal of the Koralm tunnel (portal wall of the tunnel with closed advance)*