

## KORALM, GRAZ - KLAGENFURT RAILWAY LINE, LAVANTTAL SECTION

Client: ÖBB-Infrastruktur AG (Austrian Railways Infrastructure AG)

Development Period: 1996 to 2011

### THE PROJECT

Construction works were carried out in preparation for the excavation of the Koralm Tunnel along the high performance railway section "Lavanttal". This 2.1 km long part of the line is situated in the immediate vicinity of the southern tunnel portal.

Beside extensive earth works, the project included essentially the construction of the *Lavant* Railway Bridge, a road bridge, and the relocation of the regional railway line Unterdrauburg - Wolfsberg at a length of 1.8 km with an overpass structure in the portal area of the Koralm Tunnel.

Furthermore, the *Lavant River* was relocated to a great extent, and flood control measures were implemented.

### OUR FUNCTION

BGG Consult attended 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 was conducted. This included, among others, the documentation, monitoring and supervision of the bored pile works, the optimizations of the foundations and slope securing measures, the oversight over the extended earth works and the monitoring of the slopes and bored pile walls by means of geodetic measuring and inclinometers.

### *Slope Securing Measures South Portal Koralm Tunnel:*

Based on the subsoil information gained in connection with the excavation of the exploratory tunnel Mitterpichling, the subsoil in the area of the southern portal consist of miocene Mühlendorf layers, below a cover layer of minor thickness. The Mühlendorf layers are severely weathered in the upper meters and have to be considered as highly susceptible to sliding, especially in the area of confined layer water. This soil zone partly reaches into the tunnel profile.

In order to avoid very high slope cuts and to minimize the geotechnical risks, the upward slopes for the crossing regional railway have been secured by anchored bored pile walls in some areas. In addition to that, the overpass structure was founded on four rows of bored piles.



*View of the southern portal of the Koralm tunnel; on the right anchored bored pile wall upward the track of the regional railway*