The Project
The Koralm tunnel is the central section of the planned double tracked highspeed railway “Koralmbahn Graz – Klagenfurt” between Deutschlandsberg and St. Andrä. With a total length of 32.8 km and a maximum overburden of 1,250 m it will cross the Koralpe as a base tunnel and will connect the area around Deutschlandsberg with the Lavanttal. The tunnel system consists of two single tubes with an excavation area of approx. 82 m² and cross edits every 500 m and an emergency station in the middle of the tunnel. The tunnel tubes shall be excavated mainly with tunnel boring machines, according to actual planning status double shield machines are foreseen. In March 2002 the section Wettmannstätten – St. Andrä including the Koralm tunnel was handed in for the “Environmental Impact Assessment”. For further excavation measures 3 pilot tunnels and 1 pilot shaft are foreseen. Start of excavation works of the pilot tunnels was 2004.

Geology
Along the first 4 km the Koralm tunnel passes through tertiary Florian Layer, consisting of layers of sand-, silt- and mudstone. Then the tunnel crosses the disturbed cristalline outskirts of the Koralpe, which are dominated by partially weathered rock of the sequence of foliated gneiss-micaschist. About 10 km behind the portal the tunnel enters the main cristalline zone and passes over the next 14 km unweathered sequence of foliated gneiss-micaschist, mylonitic gneisses (“Platten-gneiss”) and fine grained gneiss. Local fault zones are to be expected. About 8 km to the western portal the tunnel passes the 4 km long Lavanttal fault zones. This fracture zone is characterized by a heterogeneous structure consisting of soft-plastic, clayey disturbed rock and moderately fractured, resistant rock clods. Tectonic intensity of the fault zones system is increasing from east to west, therefore the distance between the fault zones is predicted to decrease in the same way. Beside the disturbed rock masses material mainly of the foliated gneiss-micaschist sequence and of the marble sequences will occur. Around the portal area Mitterpichling mainly homogenous rock mass with poor cemented sandstone is to be expected.

Pilot Tunnel
In order to get sufficient information about the Lavanttal fault zones system as well as the cristalline fault zones of the outskirts of the Koralpe pilot tunnels are planned to be drilled through these areas. Besides, the excavation concept itself and the tunnel boring machines shall be optimized on the real geological conditions. Pilot tunnels are foreseen in the following sections:

- **STYRIA**: beginning at the intermediate excavation stage of Leibenfeld, length up to 2,5 km, cross section: circle shaped, excavation area about 22 m²
- **CARINTHIA**: two starting points: one at the west portal and one 3,6 km eastwards after a 120 m deep shaft, total length about 8 km, cross section of the pilot tunnel will be the crown of the future main tunnel, excavation area about 40 – 45 m²
**PROJECT NAME:**
KORALM RAIL PROJECT GRAZ – KLAGENFURT

**KORALM TUNNEL**

**TYPE OF PROJECT:**
Railway tunnel

**LOCATION:**
Styria – Carinthia, Austria

**CONSTRUCTION COSTS (Civil works):**
€ 1,100,000,– (estimated)

**CLIENT:**
ÖBB (Austrian Federal Railway), Austria

**PERIOD OF SERVICES:**
Since 1996

**PERIOD OF CONSTRUCTION:**
Pilot tunnels & shafts: 2004-2009
Main tunnel: 2009-2020

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**Geoconsult’s Services**

**MAIN TUNNEL:**
- Feasibility study, route selection studies
- Preliminary design
- Environmental Impact Assessment: tunnel planner and coordinator, cost estimates on probabilistic data base, risk analysis, public relations procedure
- Hydrogeologic mapping, planning and performance of Hydro Monitoring Program, water sampling, analysis and data processing

**TENDER PROJECT:**
- Tender project based on §36.1 EisbG, preparation of tender documents, final design
- Detailed design
- Geotechnical services on site
- Construction management

**PILOT TUNNEL & PILOT SHAFT:**
- Tender design, detailed design, final design
- Construction management
- Geotechnical services on site
- Control of landfill materials

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**PROJECT DATA:**
Twin tube single track railway tunnel
Cross adits every 500 m,
Crossover incl. emergency station in tunnel center
Total length: 32.8 km
Max. overburden: 1,250 m
Excavation area: 82 m²
Pilot and ventilation shaft Leibenfeld:
depth: ~ 56.7 m, excavation area: ~ 78.5 m²
Construction shaft Leibenfeld:
depth: ~ 60.7 m, excavation area: ~ 800 m²
Pilot and ventilation shaft Pailerdorf:
depth: ~ 120 m, excavation area: 75.5 m²