Tunnels and underground constructions

We provide professional work in the fields of geological, geophysical and hydrogeological investigation, geotechnical monitoring, mathematical calculations, building inspections and diagnostics, during the preparation and design phases, the building phase and during monitoring of the operation of underground constructions.

We perform this work during the construction or maintenance of tunnels, transport constructions, collectors, water management spillways and supply conduits and other underground constructions.

Investigations for tunnels and underground constructions

- geological, geotechnical and hydrogeological investigation for the preparation of building project documentation
- assessment of the hardness and fracturing of the rock massive prior to excavation
- detection of cavities in the overburden of the planned underground constructions
- continuous monitoring of physical boundaries of underground construction lines

photo documentation of 0 - 15 m drill core

Geotechnical and geological services during construction work

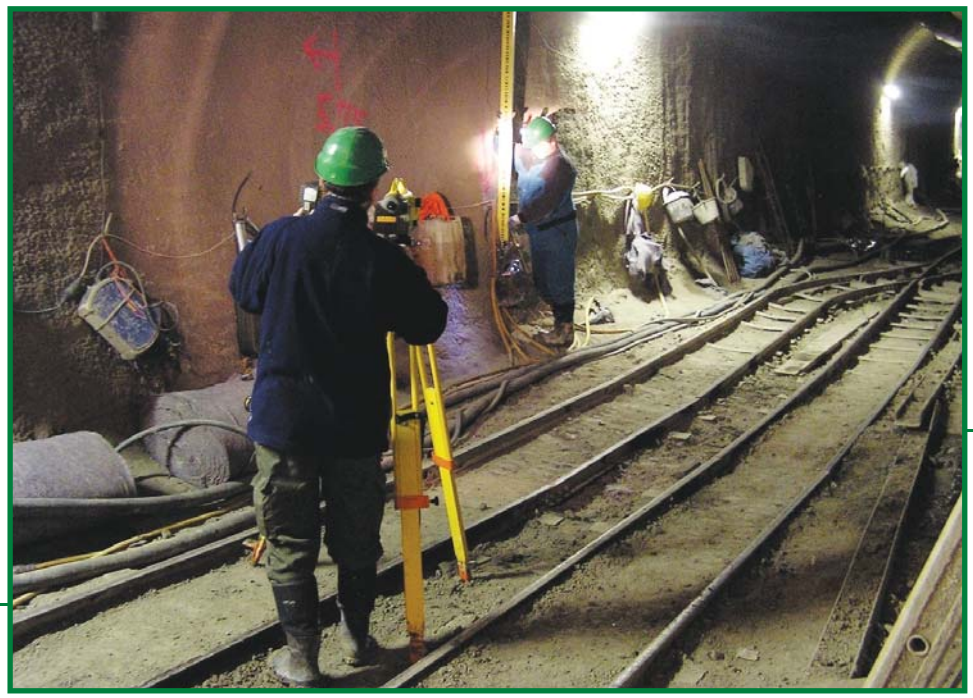
- design of technology and services for underground blasting work
- assessment and documentation of the rock massive in areas of tunnel face and gantry
- documentation of the state of the tunnel constructions and underground objects by geophysical measurement
- underground and above-ground geodetic measurements
- geological monitoring and documentation of the working face, excavation technology, control and management

geological monitoring and documentation of the working face

Geotechnical monitoring of underground constructions

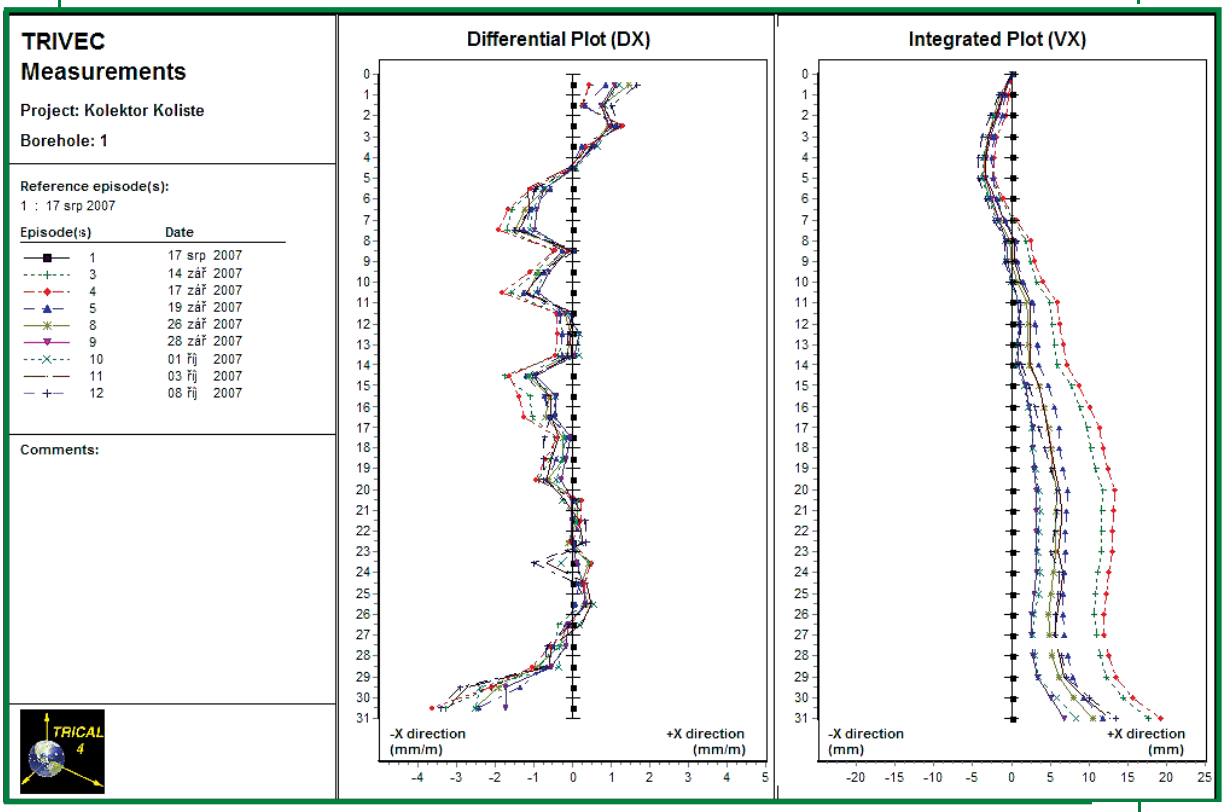
- monitoring the development of soil pressure on and inside the lining 1
- monitoring deformation in the surroundings of the cross sectional area 2

underground leveling measurements



- inclinometer monitoring of horizontal shift in the surroundings of the cross sectional area and monitoring of surface subsidence 3
- hydrogeological and hydrochemical control monitoring of constructions and their impacts on the surrounding area 4
- measurement of the burden on the environmental due to construction work and operation of the underground works (noise, vibration measurements etc.) 5

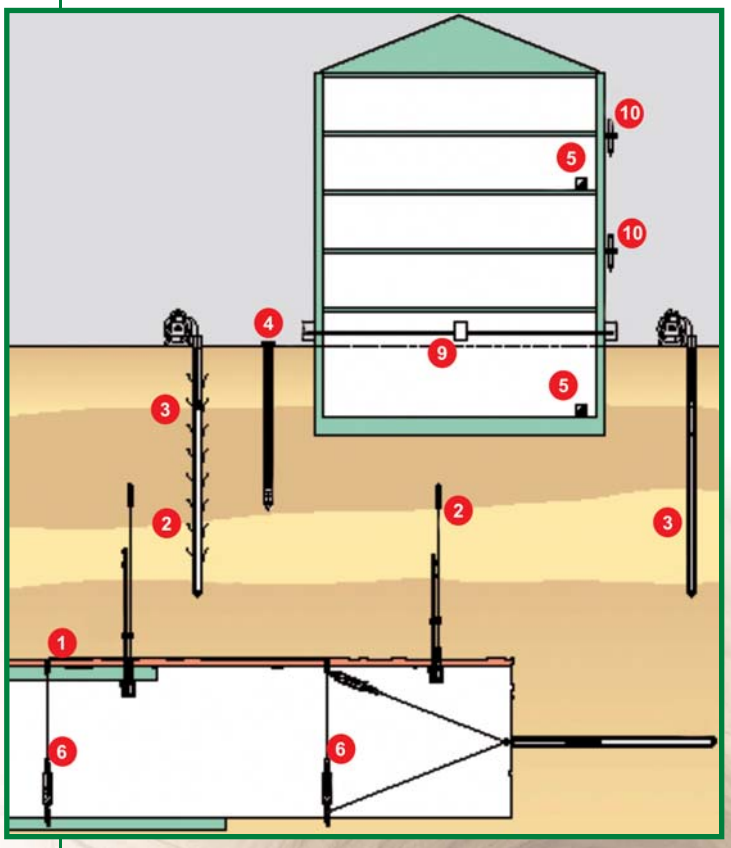
3D laser scanning



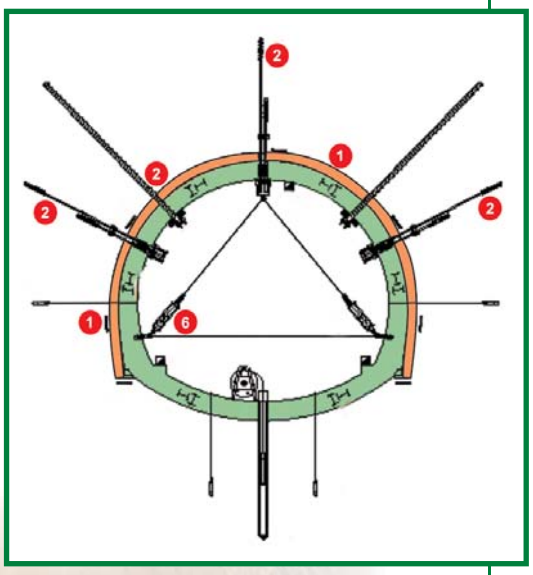
example of the results of inclinometer monitoring of horizontal movement in the surroundings of the excavation

- example of the results of inclinometer monitoring of the horizontal shift in the surroundings of the cross sectional area 6
- geotechnical monitoring of tunnel construction – linear diagram 7

- delimitation of zones of depression and stress concentrations along galleries and tunnels 8
- passportisation of buildings and built up areas above the underground works and monitoring of buildings in the zone affected by the construction of the underground works 9
- monitoring deformation on the building objects in the overburden using an electronic tilt meter, monitoring fractures in objects using a deformation meter and measurement of deformations using bar extensometers 10



geotechnical monitoring of tunnel construction linear diagram



geotechnical monitoring of tunnel construction cross diagram

- management of information and data systems for participants in the development, processing of graphic data and databases
- other geotechnical and technical measurements based on the needs of the development with the application of the NRTM observation method

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