

# In situ testing and surveys





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Investigations, surveys and tests for geotechnical, geomechanical and hydrogeological characterization of in-situ rocks and soil



## Assessment of physico-mechanical properties and natural stress state

- Large size sampling of rock and soil
- Sampling of cylinders through die-cutting and coring
- Density and water content tests of soil
- Load tests on plate (soil and rocks)
- Large scale tests of compression, shear and swelling
- Pressiometric and dilatometric borehole tests
- Single and double flatjack plate tests
- Overcoring 2D (Doorstopper) and 3D (CSIR, CSIRO) and undercoring tests
- Hydraulic fracturing tests (HF and HTPF)
- Dynamic tests on structural elements

## Tests and structural controls

- Sclerometer and SonReb tests
- Pull-out test
- Flatjack tests
- Load tests on micropiles, piles and slabs
- Pachometer and thermographic surveys
- Foundation pile integrity tests
- Ultrasonic tomography testing on masonry, columns and walls
- Borehole core sampling

## Hydraulic tests

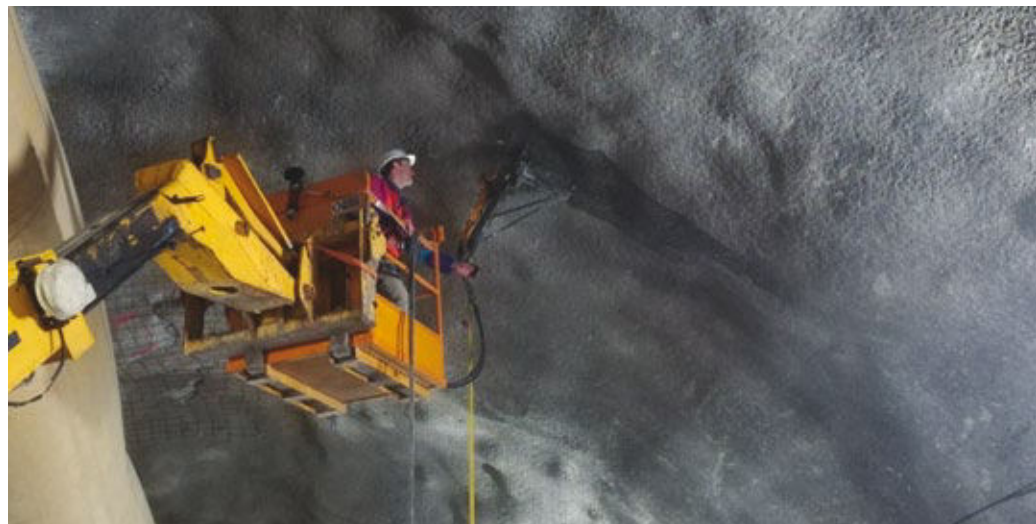
- Pumping tests and slug tests
- Lefranc and Lugeon permeability tests
- Flow measurements with tracers and micro impeller pumps

## Geophysical surveys

- T2D and 3D seismic, electric and ultrasonic tomography
- Georadar (GPR) surveys of surfaces and in boreholes
- Vibration and noise measurements
- Sonic coring and dynamic pile testing
- Borehole logging, sonic (Full Waves), temperature, gamma rays, conductivity, spontaneous potential (SP), optical televiewer surveys (OPTV) and ultrasonic (BHTV) imaging
- Single and 2D multichannel analysis of surface waves (MASW) surveys
- Audio-magnetotelluric (AMT) surveys
- Seismic face surveys of tunnels under construction

## Inspections

- Visual inspections of tunnel lining and structure
- Excavation profilometry and tunnel lining by means of 2D and 3D laser scanning systems
- Borehole inspections and surveys with colour television probe





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