

Services Offered by Sigra

Geology

Lithological and structural evaluation

Detailed Site Investigation

Drill site operations

- Coring with high logging standards
- Open hole drilling

Borehole geophysical assessments

- Lithological
- Structural
- Geotechnical

Surface geophysics

Seismic assessment

Gas content

- Core desorption
- Gas capture core barrel
- Gas capture without coring

Rock stress measurement

- Overcoring
- Hydrofracture
- Borehole breakout

Groundwater measurement

- Oilfield based drill stem testing (DST) techniques
- Pulsed DST testing for directional permeability
- Multi-level and deep piezometer installation
- Pumping tests

Design

Tunnel alignment

Rock support

Retaining walls for tunnel entries

Cut and cover design

Diaphragm wall design

Water drainage

Gas drainage

Grouting for stability or groundwater control

Ground freezing

Ventilation

Find out more at sigra.com.au





Tunnels and Underground Caverns

Significant Projects

Client: Snowy Hydro/GHD and SMEC

Projects: Snowy Hydro 2.0 Feasibility Study - Geotechnical Site Investigation

Sigra was initially contracted to measure the rock stress in holes drilled in meta-sediments up to 1100 m depth. It conducted 71 successful IST overcore stress measurements and the material property testing of the associated rock samples. Sigra also measured stress in fractured rock using hydro-jacking, and conducted packer tests for rock mass fluid conductivity. The packer testing was replaced by the much more useful Sigra drill stem tests which gave precise values of pressure and permeability in the rock mass. Sigra was then engaged to geotechnically review the project in the light of the findings of the site investigation.

Projects: Rail and Road Tunnels - Sydney, Melbourne & Brisbane 2014 - Present

Sigra has conducted In-situ stress testing by overcoring using the Sigra IST system on most major tunnelling projects in Australia, including Sydney Metro, Melbourne Metro, WestConnex and the Brisbane Cross River Rail. Clients requested the Sigra IST method over other stress testing methods as an IST can be carried out quickly and produces reliable results in competent rock. A typical test time for depths less than 100 m is 1 ½ hours. As much of the sedimentary rock encountered was extremely non-linear new advanced rock testing methods and theory have been developed. These are a world first and enable true rock properties to be determined and used in the analysis of the overcore and in the tunnel design.

Client: VSL Intrafor/Dragages

Projects: Liang Tang tunnel project, Hong Kong, Balanced Pressure Drilling System

In 2016 Sigra was commissioned to design and build a pressure control system to permit drilling through a tunnel lining into unconsolidated ground below the water table. The purpose of this was to enable the injection of grout to consolidate the soil around cross passages so that they could be excavated safely from tunnel to tunnel. The system eliminates problems of uncontrolled water and soil outflow from the borehole and prevents liquefaction of the ground around the borehole while drilling.

