



Trilab

Accurate Quality **RESULTS**
For Tomorrows **ENGINEERING**

www.trilab.com.au

Australasia's Leading Independent Soil and Rock Testing Laboratory

Contents

- 4 *GM's Statement*
- 6 *Who We Are*
- 8 *What We Do*
- 10 *Where We Work*
- 12 *Management Team*
- 14 *Our Projects*
- 16 *Our Clients*

 **Trilab**



Welcome

Trilab has been assisting clients in mining, civil construction, and infrastructure projects across the Asia Pacific region since 1994.

Technical assessment of soil and rock characteristics is becoming a critical component of the design of large-scale mining and infrastructure projects and this is where Trilab excels.



Accurate Quality Results, For Tomorrows Engineering"



General Manager's Statement

Since the establishment of Trilab in 1994, what was once a single laboratory with just two staff members has continued to grow to become what it is known as today - an extremely reputable soil and rock testing company with 3 laboratories and over 50+ employees in both Brisbane and Perth.



— COL PURVIS

During this period of growth, Trilab has continued to ensure the delivery of accurate and timely results to its many customers in the mining and civil infrastructure sector.

Over the years, Trilab has become one of Australasia's premier laboratories which provides specialised soil and rock mechanics testing.

Trilab boasts a significant clientele base, with a range of clients from across Australia, Africa, Asia and South America sending samples from various major projects for testing at one of the most well-known laboratories in the Southern Hemisphere. This has been facilitated by Trilab gaining quarantine approval for the storage and handling of imported soil and rock samples.

With a recent and major investment in state-of-the-art rock and soil mechanics equipment, Trilab has positioned itself to be the leading supplier of specialist services throughout the region. This investment has led to the acquisition of a number of major contracts, with both Australian and International companies.



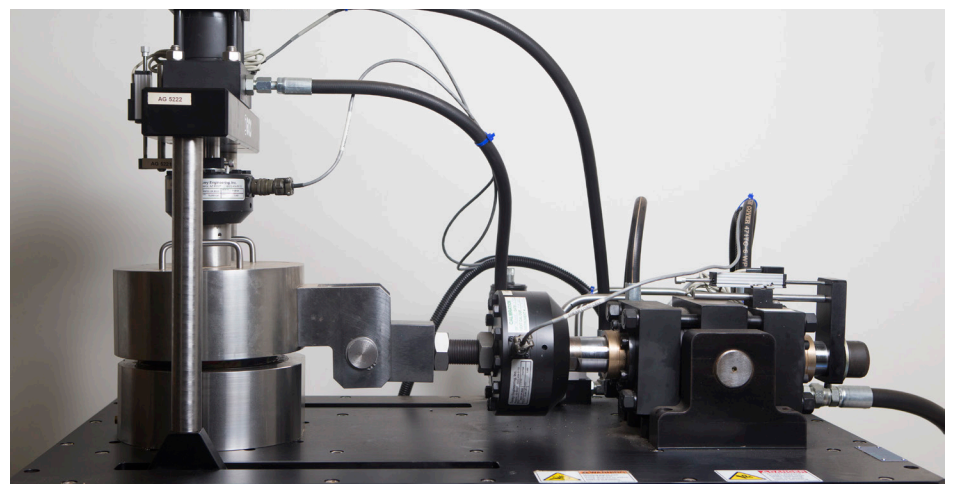
FOCUSED AND COMMITTED STAFF

Trilab could not have achieved this success without the efforts and commitment of its staff members. Their 'can-do' attitude and dedication to the business is exemplified through the accuracy of testing and the timely provision of results to customers in each and every case.

REPUTATION FOR INNOVATION

Operating within an ever-changing industry, Trilab maintains its reputation as a very highly acclaimed supplier of specialised soil and rock testing. Trilab provides clients with the testing they require and constantly develops modern testing techniques to suit the specific needs of customers, regardless of how uncommon or different they may be.

At Trilab, our vision is to be constantly looking forward to new opportunities, to try new testing regimes and to continually improve our methods, so that we are able to meet our clients current and future testing needs.



Introduction

Australasia's Leading Independent Supplier of Specialised Soil and Rock Testing

Trilab has been assisting clients in mining, civil construction, and infrastructure projects across the Asia Pacific region since 1994. Technical assessment of soil and rock characteristics is becoming a critical component of the design of large-scale mining and infrastructure projects and this is where Trilab excels.



SUITE OF SOIL AND ROCK TESTING

Trilab offers a wide range of tests across a series of industries. Make Trilab your critical design partner for increased confidence in design

TRIAXIAL TESTING

Over 30 load frames available capable of specimen diameters 50mm, 63mm, 75mm, 86mm, and 100 mm; pore pressure measurement and data acquisition; maximum confining pressure of 3,500 kPa

ROCK STRENGTH TESTING

Including Direct Tensile, UCS, modulus testing, P and S Wave, Hoek-cell and high strength Triaxials with a capacity of 2,500 kN and maximum confining pressure of 140 MPa

DIRECT SHEAR TESTING

Up to 12,500 kPa normal load; with data acquisition and surface profiling including large particle 300mm boxes



Trilab is Australasia's largest independent soil and rock testing laboratories. Established in 1994; we have been in the industry for over 25+ years. Our expertise stands the test of time.

WHY CHOOSE TRILAB

Trilab is accredited by the National Association of Testing Authorities, Australia (NATA, Accredited Laboratory No. 9926). The scale of Trilab's laboratories and our expertise results in Trilab being the supplier of choice to some of the world's largest mining and exploration companies.

ACCURATE, CONSISTENT AND TIMELY RESULTS

Trilab's tests have integrity, are accurate, and consistent our adherence to NATA rules and our ISO17025 certified quality system ensures our results are accurate, consistent and delivered in a responsive and timely manner.

CONFIDENCE IN DESIGN

Test results can assist in reducing the overall cost associated with large scale mining and infrastructure projects

WE WELCOME LABORATORY VISITS



200+

Years combined industry experience in our management team



3

State of the art, specialised laboratories performing highly precise soil and rock testing



50+

In-house engineers and technicians based in Brisbane and Perth



NATA

World Recognised Accreditation.
Accredited Laboratory No. 9926.

Our Services

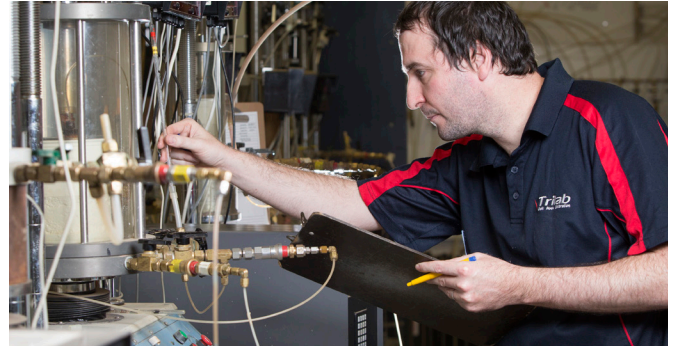


ROCK MECHANICS TESTING

Trilab has the capability to undertake a suite of rock mechanics testing. The company houses the latest state of the art equipment and associated data acquisition and instrumentation.

Trilab's specific rock mechanics testing range includes:

- GCTS High Pressure Triaxial RTR-2500 Rock Testing System – capacity of 2,500kN with a maximum 140MPa confining pressure
- 7 Compression machines for Rock UCS testing incorporating Young's Modulus and Poisson's Ratio
- 4 Extensometers for Rock UCS testing incorporating Young's Modulus and Poisson's Ratio
- Over 19 Direct Shear units – up to 100mm square box; capable of up to 2,500 kPa normal pressures; all with data acquisition; Hencher correction; surface profiling
- Over 30 Triaxial frames – specimen diameters of 50mm, 63mm, 75mm, 86mm, and 100mm; all have pore pressure measurement and data acquisition; run concurrently; to a maximum confining pressure of 3,500 kPa for weathered rock
- 5 Hoek-cell high pressure triaxial units – specimen diameters of 50mm, 63mm, and 83mm; all with data acquisition; to a maximum confining pressure of 50 MPa
- Direct Tensile Strength testing of intact rock core specimens to ASTM International standards
- P and S Wave / Sonic Velocity units – specimen diameter of 50mm, 63mm and 86mm; all with data acquisition
- Acoustic emission testing for crack initiation determination during UCS and Rock Triaxial testing.
- Point Load Index
- Brazilian (indirect tensile strength)
- Slake Durability and Dispersion
- Cerchar Abrasivity
- End-grinders for rock sample preparation
- Intact strength rock shearbox with a capacity of 12,500 kPa normal stress.

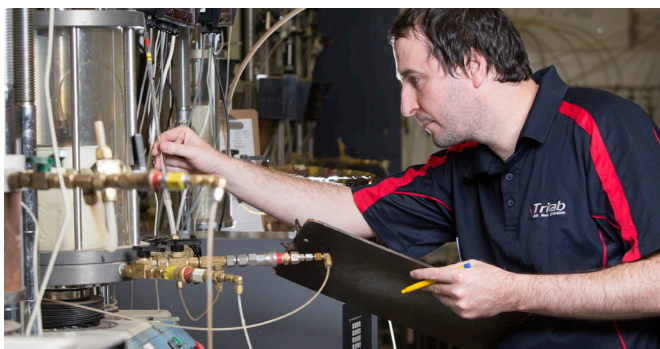


ADVANCED SOIL MECHANICS

Trilab has the capability to undertake a suite of advanced soil mechanics testing. The company houses the latest geomechanical testing equipment and associated data acquisition and instrumentation.

Trilab's specific advanced soil mechanics range includes:

- Over 30 Triaxial frames – specimen diameters of 50mm, 63mm, 75mm, 86mm, and 100mm; all have pore pressure measurement and data acquisition; to a maximum confining pressure of 3,500 kPa
- Over 30 Oedometer cells – all with data acquisition
- Over 20 Direct Shear units – up to 100mm square box; capable of up to 2,500 kPa normal pressures; all with data acquisition
- 300mm Shear Boxes with a maximum particle size capacity of 30mm.
- 16 dedicated Triaxial Constant-Head Permeability testing units
- Torsional Ring Shear testing unit.
- Rowe consolidation cell
- CRS consolidation set up
- 2x repeat load triaxial machines
- 6 x critical state locus triaxial machines with the capability of Isotropic, Anisotropic and K0 consolidation.
- Cyclic direct simple shear



SOIL MECHANICS

Trilab has the capability to undertake a suite of geomechanical design testing.

Trilab's specific soil mechanics testing range includes:

- UCS (generally referred to as Quick Undrained [QU] testing) and Young's Modulus
- Permeability (Falling Head, Constant Head and Triaxial)
- CBR and Compaction
- Classification and index testing (including Particle Size Distribution, Hydrometer, Atterberg Limits and Shrink/Swell)
- Dispersion and Chemical Testing
- Playing field material assessment, and partially saturated soils testing (includes water holding capacity, saturated hydraulic conductivity, and moisture release curve)
- 2 Extended Height consolidation testing units

AGGREGATES

Trilab has the capability to undertake a range of aggregates tests using the latest up to date equipment. To reduce costs, a suite of tests can be designed to meet the customer's specification requirements.

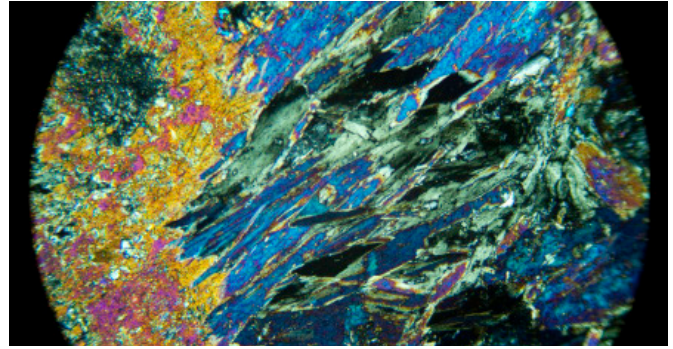
Trilab's specific aggregates testing range includes:

- Particle Size Distribution
- Wet / Dry Strength Variation
- Los Angeles value
- Flakiness Index
- Degradation Factor – Source Rock and Coarse Aggregate
- Crushed Particles in Coarse aggregate derived from gravel
- Average Least Dimension
- Aggregate Crushing Value
- Materials finer than 75 Microns in aggregates (by washing)
- Particle Shape by Proportional Calliper
- Aggregate Soundness – Evaluation by exposure to sodium sulphate solution
- Weak Particles (including clay lumps, soft and friable particles) in coarse aggregates
- Clay and Fine Silt (settling method)
- Organic Impurities other than sugar
- Particle Density and Water Absorption – Fine / Coarse Aggregates
- Bulk Density of Aggregate (Unit Mass)

WORKING TO STANDARDS

Trilab adheres to the testing methods defined by Standards Australia, and is accredited to other standards including ASTM International and standards associated with other jurisdictions.

In order for Trilab to complete tests to the appropriate standard, customers are required to provide samples consistent with the minimum quantities and core diameters outlined in the Guide which can be found on our website.



CALIBRATION AND INSTRUMENTATION

Trilab offers a range of calibration and instrumentation services. This includes on-site and off-site calibration and repair services of a large range of engineering metrology equipment including:

- NATA calibration of wire woven and plate sieves to AS, ASTM and ISO specifications.
- Dial Gauges to NATA Construction Materials Testing requirements
- Dial Gauges to AS2103 requirements
- Extensometers
- Load Cells / Proving Rings
- Concrete Testing Machines
- Materials Testing Machines
- Single Range and Delta Range Electronic Balances to 60 kg
- Pressure Gauges / Transducers
- Vernier calipers
- Rubber hardness
- Trilab also provides development, troubleshooting and support services of existing software assisting in the automation of laboratory test methods.

PETROGRAPHIC ANALYSIS AND GEOCHEMICAL TESTING

Geochempet Services specialises in petrographic aspects of engineering geology particularly in the quarrying industry and related areas. Over 20,000 consultancy assignments have been performed for mineral exploration, quarrying and construction companies.

Geochempet's petrographic analysis and geochemical testing services include:

- Petrographic analysis of quarry products to ASTM C 295 and AS 1141 (AS 1141.65)
- Assessment of asbestos material by petrographic or SEM/TEM analysis AS4964
- Assessment of Secondary Mineral Content AS 1141.26
- Rock material weathering classification AS1726
- Petrographic assessment of Hardened concrete with specific attention to ASR/AAR, delayed ettringite and cement mix design ASTM C 856
- Shape analysis on sand product for use in Petroleum Industry AP19C
- X-Ray Diffraction both qualitative and quantitative analysis with mineral, clay and amorphous content.
- X-Ray Fluorescence and other Geochemical analysis
- Scanning Electron Microscope/TEM investigation on quarry products and construction materials
- Friction ignition testing to Wards Classification Diagram
- Exploration Petrographic analysis with petrogenesis interpretation including origin, alteration and metamorphism.
- Microscopic identification and grain counting of heavy mineral concentrates in heavy mineral sands
- Quarry assessment and for main roads certification QLD QRS2, QRS3 and QRS4

Our Locations

Trilab operates three fully serviced soil and rock testing laboratories in Australia. Based in Brisbane and Perth Trilab offers industry leading turn around times on samples. Our laboratories are located to service the Asia-Pacific region and the world.

QUARANTINE APPROVED

Trilab's Brisbane laboratory possesses Australian Department of Agriculture, Fisheries and Forestry Permits to import, store, handle and treat quarantine material under the Quarantine Act 1908 which authorises the company to import soil and rock samples from all countries subject to certain conditions.

QUEENSLAND TRANSPORT AND MAIN ROADS

Trilab holds 'C.M.T registered supplier' status with the Department of Transport and Main Roads Queensland (registration No. SRS051). This accreditation means that client testing conducted by Trilab for a Main Roads project will be accepted by the Department of Transport and Main Roads Queensland.



03 Laboratories

Management Team

Our management team, led by our General Manager, manages the daily operations of Trilab. The team is firmly focused on improving the customer experience, achieving operational efficiencies and providing high quality, affordable test results to the engineering, mining, and infrastructure industries worldwide.



Colin Purvis
General Manager



Chris Channon
National Laboratory Manager



Thomas Spring
Geochempet Services



Tarin Glazier
Calibration Manager

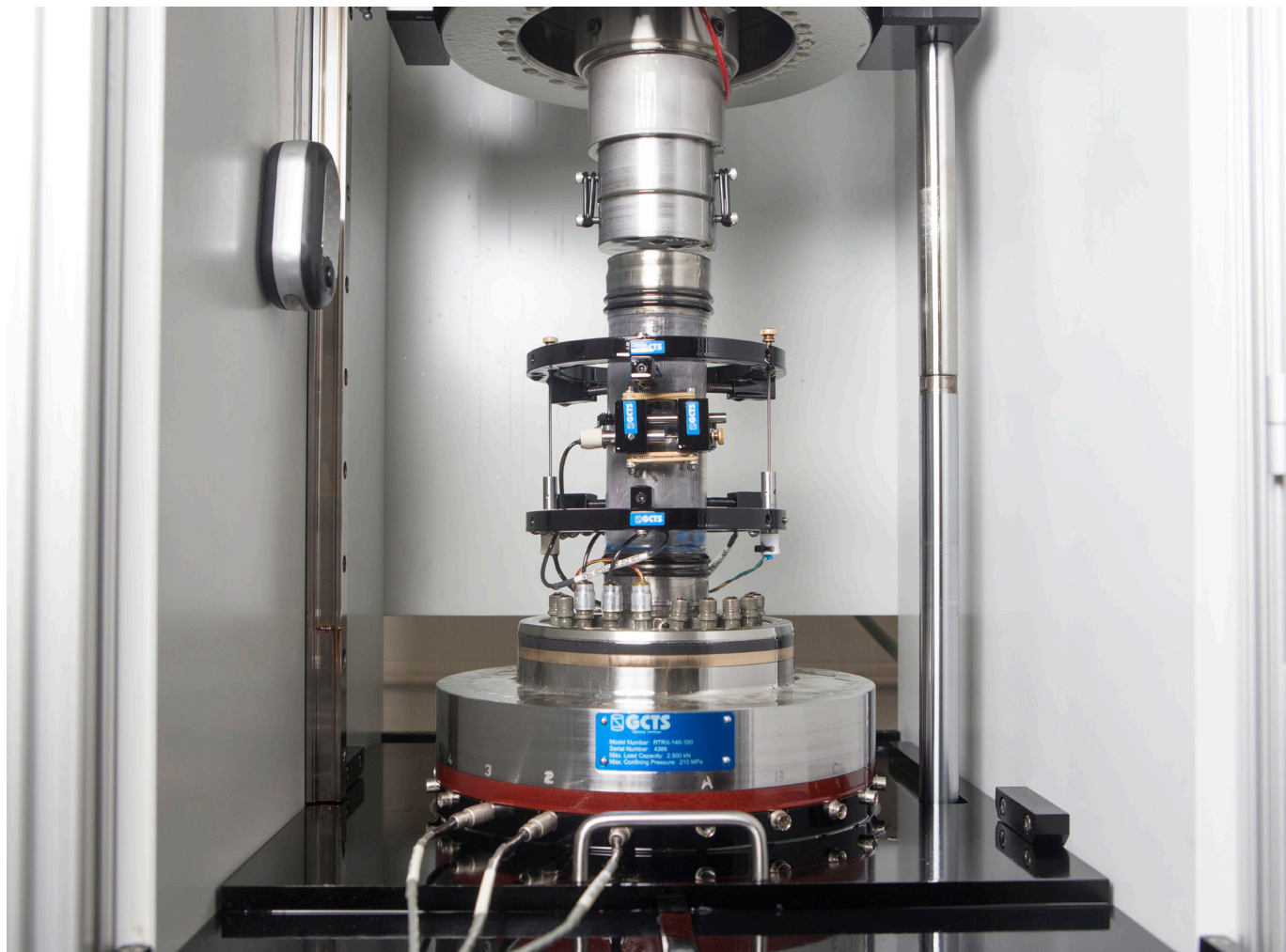


Chris Park
Brisbane Laboratory Manager



Gerard Creely
Perth Laboratory Manager

Recent Projects



OLYU TOLGOI UNDERGROUND MINE

Trilab is currently undertaking a large testing program for Olyu Tolgoi Underground Mine. Testing involves rock triaxial testing as well as multi stage direct shear testing on rock core with pre-existing joints.

Core has been flown half way around the world in order to make use of Trilab's Rock Mechanics laboratory; particularly its Rock Triaxial system.

This system allows for multi stage triaxial tests with confining pressures from 0.1MPa to 140MPa. The availability of an on sample strain measurement system complete with strain rate control allows for the determination of Elastic Properties.

This allows for greater repeatability of test conditions for each of the samples tested during the testing program.

Direct shear samples will have laser surface profiling performed prior to and following shearing in order to evaluate JRC values prior to shearing and to enable evaluation of the damage done to the defect surface during shearing.

Our Clients

Our solutions are popular with large, middle-sized and small companies alike. Below you will find a short selection of companies that use our services all around the world.

A Selection of Our Clients



Rio Tinto

Rio Tinto



Golder Associates

Golder Associates



srk

SRK Consulting



CM&G

Cartledge Mining & Geotechnics



RA

Raine & Associates



PSM

Pells Sullivan Meynink



Oyu Tolgoi

Oyu Tolgoi

What Our Clients Say



David Haskins
Worley Parsons Group



I have over the course of two years passed through a number of significant sample programmes to Trilab, Brisbane, from our Wafi-Golpu Project.

I have to say that without exception I have been very impressed with your services. Every conversation and email communication that I have had with your team has been exceptional. They have always committed to being reliable, responsive and courteous even under difficult and changing time frames as well as modified requests.

In particular, I would like to thank Chris Channon who has provided extraordinary assistance and support in helping us achieve our project outcomes. Chris has always accommodated our requests and has diligently delivered on his promises.

Duncan Tyler
pitt&sherry



Many thanks for getting these processed so quickly. Reiterating Ronald's comments from earlier on thank you for spending time with us yesterday, I really enjoyed my time in the lab yesterday and it was a great pleasure seeing someone who is so obviously passionate about their work. I have great confidence in all of the test data that we have received from you.



Trilab

346A Bilsen Road
Geebung 4034
Queensland
Australia

+61 7 3265 5656
test@trilab.com.au
www.trilab.com.au

member of group
kiwa 