

Independent Soil and Rock Geotechnical Laboratory Testing

In addition to our vast scope of routine soil and rock testing, Geolabs Limited also offers an impressive range of advanced soil testing capabilities. These make Geolabs a one-stop solution for all your geotechnical testing needs, irrespective of the size or complexity of your project.

We are always willing to discuss how we can adapt and customise our methods to suit your particular needs.

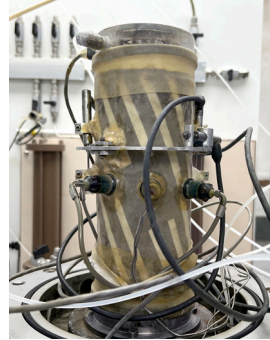
Cyclic Triaxial



3 sets of state-of-the-art **Cyclic Triaxial** testing equipment to simulate dynamic loading on soil samples and measure the response of the soil under such conditions, with the capability for both **strain** and **stress controlled** loading.

- Piezo bender elements for shear-wave velocity measurement
- Mid-plane pore pressure transducer
- Local axial and radial strain LVDTs
- Tests on 70mm and 100mm specimens
- Frequency range up to 5 Hz
- Independent computer control of vertical and horizontal total and effective stresses for anisotropic stages and stress paths.
- Measurement of volumetric strain with a precision of 1 mm³

Advanced Triaxial



9 **Advanced Triaxial** cells, all of which equipped with a full suite of instrumentation for both 70mm and 100mm diameter specimens, including **local axial** and **radial strain** measurements to assess stiffness variation at small strains, and **mid-plane flushable pore pressure** transducer.

- Piezo bender elements in 3 orientations (S_{v_h} , S_{h_v} , S_{h_h})
- Shearing in either extension/compression or pre-determined stress paths
- K_0 condition testing
- Total and effective stress path testing
- Independent computer control of vertical and horizontal total and effective stresses for anisotropic stages and stress paths.
- Measurement of volumetric strain with a precision of 1 mm³

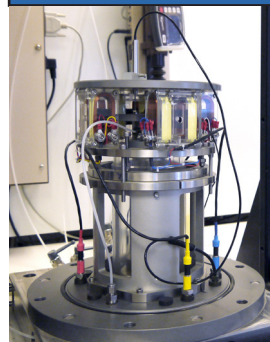
Cyclic Direct Simple Shear



3 sets of **Cyclic Direct Simple Shear** (DSS/CSS) equipment capable of performing both **monotonic** and **cyclic** loadings with sinusoidal or custom loading profile, including two with a capacity of 10 kN and one with 5 kN.

- High-speed closed-loop computer controlled loading
- Active constant volume control
- Controlling either the shear load or the shear strain
- Low-friction PTFE-coated stacked rings
- Frequency range up to 5 Hz
- Platens available with **pins** and **pins**

Resonant Column



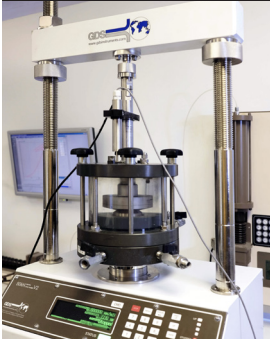
The state-of-the-art Hardin Type **Resonant Column** apparatus (H-RCA) allows for the determination of shear modulus and damping ratio over a range of small strains, which can be linked with advanced triaxial tests to give a broad picture of the material's **stiffness characteristics**.

- Defines the early stiffness decay curve
- 70 mm specimen diameter
- Measurement of volumetric strain with a precision of 1mm³
- Excitation frequency at every strain
- Torsional or flexural induced vibrations



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CRS Consolidation



2 closed-loop controlled **Constant Rate of Strain (CRS)** oedometers measure permeability and allow consolidation parameters and permeability to be calculated **seamlessly** over the **whole testing stress range**.

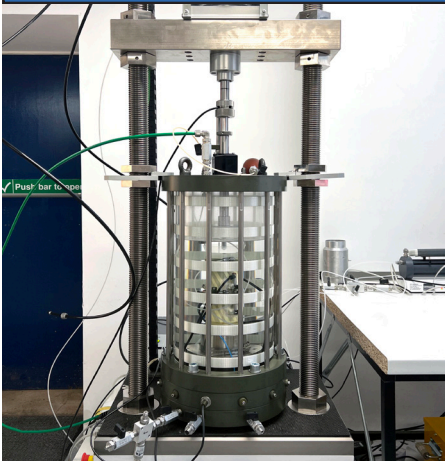
- 38mm, 50mm, and 66mm diameter samples
- Maximum load capacity of 50 kN
- Pre-consolidation pressure based on continuous curve
- Continuous curve of void ratio (e) vs $\log p'$
- Continuous c_v
- Continuous m_v
- Continuous k (calculated)

Imperial Suction Probe



Imperial College type **suction probe** test measures the **matric suction** of arriving soil samples to the laboratory.

Piezoelectric bender elements are also employed to measure the shear wave velocity through the soil sample in vertical (S_{vh}) and horizontal directions with both polarizations (S_{hv} & S_{hh}).



Cyclic Triaxial



Lubricated Ends Triaxial Tailing Specimen



Advanced Triaxial

