



Environmental
Geotechnical
Specialists



COMPREHENSIVE GEOTECHNICAL & ENVIRONMENTAL ENGINEERING SERVICES
DELIVERED USING OUR OWN DRILLING RIGS / CREWS / SOILS LAB / ENGINEERS

OUR PEOPLE YOUR SITE INVESTIGATION: HOW IT WORKS

The Laboratory Team



Harry Letch
Laboratory Technical Manager

Val Letch
Laboratory Support

Toby Merry
Laboratory Quality Manager

Mark Tuck
Field & Laboratory Technician

Once the Fieldworks Team have **collected the samples** and returned them to our **in-house laboratory**, the spotlight falls on the Laboratory Team.

It's their job to **uncover the information that lies within each sample**, using a variety of tests and analytical tools. But the RGS family frequently works in partnership, and while the testing and analysis is primarily the realm of the Laboratory Team, this **highly interactive process** often brings together the various skills of every RGS team to **update, advise, instruct and support** wherever necessary.

RGS embraces the **highest quality** in all that we do and this is clearly seen in our laboratory. Our lab practices, management and protocols are all **UKAS accredited** and we maintain the highest standards of testing to UKAS and **British Standards**. Where we occasionally need a particular test that we don't run in-house, we can outsource to a trusted and **fully accredited testing partner**. Continuing professional development is a top priority for everyone at RGS and in addition, Laboratory Team members are assessed and tested at least twice a year. For you, this means **you'll always get the best and most secure information possible** about your site, so you can make **safe and profitable decisions** for its development.

A. INITIAL PROCESSING

1 Booking in the samples

Members of the Laboratory Team book in each individual sample retrieved from your site.

It's vital that the samples are kept in a consistently ambient temperature to preserve their integrity and nature.

Because some soil types are prone to drying out, we coat certain samples in wax to maintain their moisture content and allow accurate analysis.

2 Logging

The samples are logged (described) by members of the engineering team and borehole/trialpit records are produced.

Using their knowledge of your individual site, proposed development plans and the borehole/trialpit records, the engineers specify the geotechnical and environmental tests that the Laboratory Team need to carry out on your site samples. For efficiency, the logging and production of test schedules is all recorded online.

STAGE B > OVERLEAF

B. GEOTECHNICAL LABORATORY TESTING: CLASSIFICATION

The Laboratory Team categorises soils and rocks via classification tests which establish their basic properties. There are many such tests, but the following four tests are used most frequently:

- 1 Moisture content** - this fundamental property of soil dictates the strength of clays. Moisture content is estimated from the ratio of the mass of water it contains to the mass of dry soil. Saturation affects different soils in very different ways which may have significant implications for any construction project.
- 2 Particle size distribution** - shows the range of particle sizes within a soil. This varies from the finest clay particles of less than 0.002mm in diameter through silts of 0.002 to 0.06mm, sands of 0.06mm to 2.0mm and gravels of 2mm upwards.
- 3 Index properties** - this suite of tests helps to classify cohesive soils by assessing the liquid limit (the water content at the transition between plastic soil and a liquid) the plastic limit (where the soil changes from a plastic state to a semi solid state) and the plasticity index, which is the difference between the liquid and plastic limits. These tests are commonly used to assess the shrink or swell potential of the soil, which in turn helps to establish if heave or consolidation of the soil could occur due to tree roots growth.
- 4 Density tests** - there are numerous density tests, but all establish the mass per unit volume of a soil. Classification tests provide the engineers with the base parameters needed to plan the engineering.

C. GEOTECHNICAL LABORATORY TESTING: ENGINEERING

Our specialist team is fully trained and equipped to carry out a wide range of geotechnical tests in our own laboratory. However, the following three are good examples of commonly used tests whose results are critical in designing safe foundations for almost any build.

- 1 Shear strength test** - crucially important in construction, the shear strength of a soil mass can be seen as its ability to resist failure when forces act upon it: this strength arises from factors which include the bonding, friction and interlocking of its particles.
- 2 Consolidation tests** - determine how far a soil reduces in volume when placed under static loads. Whether you're placing a load (eg a crane pad) on a single spot, or across a wider area (eg a concrete platform), it's essential to know how far a soil will deform or compress and whether it can spring back as the safety of your finished building depends on it!
- 3 Compaction tests** - determine the optimal water content at which soil can reach its maximum dry density (ie with the fewest possible air voids). Compaction increases the density of a soil and influences its shear strength.
- 4 In situ tests** - sometimes, the Laboratory Team uses its expertise and testing techniques in the field. These in situ tests include plate load testing (often used to identify the ultimate load-bearing capacity of ground and the settlement under a specified load*) as well as California Bearing Ratio (CBR) tests and sand replacement density (SRD) tests, both used in road and pavement design.

D. ENVIRONMENTAL

Where land has previously been worked or built on, environmental testing is a high priority. In addition, if there are potential contamination sources in the local area (such as chemical works, warehousing, manufacturing units and landfill sites), it's possible that your site may have been polluted by water leaching underground.

In the past, buildings were better ventilated by airbricks (not to mention badly fitting windows and doors!) but today's double-glazed, and well-sealed homes and workplaces keep toxic fumes from ground contaminants circulating in the air we breathe! Environmental testing by our Laboratory Team ensures that your future build is safe and secure, both as a structure and as a human environment.

- 1 Chemical tests** - depending on the context of the site, we test for substances (eg chlorides, total soluble sulphates, nitrates, hydrocarbons, petrochemicals and metals) that may corrode or degrade concrete or steel foundations, or otherwise impact on the health of your construction team and end users.
- 2 Gas monitoring** - where a site's soils, geology, location or history suggest a gas risk, our Field and Lab Technicians in partnership with the Fieldworks Team can carry out specific tests for gases such as methane, which is potentially explosive, carbon dioxide, which is an asphyxiant and radon which is a carcinogen.
- 3 Groundwater monitoring** - is also carried out by our Field Technicians to establish the groundwater profile for the site.

WHEN THE TESTING IS **COMPLETE** ALL DATA IS PASSED TO **THE ENGINEERS** FOR THEIR ANALYSIS.

Your engineer(s) then write a **COMPREHENSIVE SITE INVESTIGATION REPORT** which enables you to

BUILD SAFELY + PROFITABLY.

Your report is the final outcome of **HIGHLY INTERACTIVE TEAMWORK** by RGS specialists who strive to give you

THE BEST POSSIBLE SERVICE, EVERY TIME.

*[Click here](#) to download our **PLATE LOAD TESTING** INFO SHEET written by our CONSULTANT, Steve Rogers.

TELEPHONE:

01484 **604354**

EMAIL:

enquiries@rogersgeotech.co.uk

FAX:

0843 51 599 30

