Resource and Environmental Consultants Ltd

Ground Investigation

Why Undertake Ground Investigation?

Ground investigation is undertaken at the start of a project to assess the condition of the soil, the underlying groundwater and the geological conditions of a site.

By its very nature, ground investigation only samples a very small amount of the soil, or water on any site. Thus it is possible that pockets of contamination and changes in ground conditions lie between the points tested. This is where the skill of experienced consultants is needed in order to minimise the risk as much as possible.

REC uses a wide range of sampling and analysis techniques in its ground investigation work.

Borehole Development

A borehole is an exploratory hole drilled into the soil and rock to gather physical data. Both water samples and gas samples can be taken out of boreholes. Often boreholes are left in place after construction in order to allow continued gas/groundwater sampling.

Shell and Auger Boring

This technique involves using a cable percussion driven tool to collect samples. The technique is especially useful where space is an issue and is generally used in the investigation of softer ground. The technique is particularly useful because it allows the maximum amount of information to be obtained from the soil sample.

Rotary Auger Boring

In this type of borehole a rotary auger collects the sample with a central core for sample collection built in to the drill. This type of boring is particularly useful when hard ground conditions are encountered.

Rotary Coring

When an assessment of the strength of the rock or when assessing the distribution of lithologies it is necessary to retrieve samples of rock. Rock mechanics requires the retrieval of undisturbed samples for physical laboratory testing. Therefore REC is acutely aware of the need for high quality data.

Trial Pitting

This is a rapid and inexpensive method of examining the soil on a site. The process usually involves digging a trench with an excavator in order to allow sampling of the revealed soil. Trial pitting has its limitations in that soil can only be sampled to the reach of the excavator and the soil obtained is highly disturbed.

Window Sampling

Window sampling is a cost effective technique that is routinely used to provide an assessment of ground conditions within superficial materials. Window sampling allows for the drilling of boreholes to a shallow depth (normally <10mbgl), retrieval of samples (undisturbed and disturbed) and the installation of groundwater/ ground-gas pipe work and infrastructure.

Soil Vapour Surveys

Soil vapour surveys are used to investigate whether vapours such as landfill gas, petroleum hydrocarbons and solvents are being generated by the soil. These types of surveys are usually carried out on site using direct reading instrumentation, however REC can, through its UKAS accredited sister laboratory company, also obtain speciated analyses of vapours from the soil.

Soil and Groundwater Collection

REC collects soil samples for chemical analysis to determine the presence of any contamination. The method of soil sampling varies depending on the soil type, and the contaminants being tested. Most chemicals can be sampled from disturbed soil, as would be the case in trial pitting. When undisturbed samples are required, sampling tubes can be used to keep the soil in its original condition.

Water samples are often collected from boreholes and surface water for chemical analysis. These samples are analysed for possible contaminants, using knowledge gained about the site's historic use.

Analysis and Interpretation

The data obtained from the sampling and analysis is used for comparison with published values such as the CLEA guidelines. Expert interpretation of the data then provides an accurate picture of the ground conditions.

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