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Geotechnical Engineering and Environmental Services across the UK.

SITE INVESTIGATION METHODS

1. WINDOWLESS SAMPLER BOREHOLE RIG
2. RESTRICTED ACCESS WINDOWLESS SAMPLING
 - A. CUT DOWN RIG
 - B. HAND HELD
3. RESTRICTED ACCESS (CABLE PERCUSSIVE)
4. CABLE PERCUSSIVE BOREHOLE RIG
5. TRIAL PITTING
6. ROTARY DRILLING



1. WINDOWLESS SAMPLER BOREHOLE RIG

- SUITABLE FOR RESTRICTED ACCESS DRILLING
- TRACKED SELF-PROPELLED VEHICLE
- ALLOWS IN-SITU GEOTECHNICAL TESTING
- ALLOWS INSTALLATION OF GAS AND GROUNDWATER MONITORING WELLS

Windowless sampler rigs consist of a tracked self-propelled vehicle operated by a crew of two. These rigs are suited to restricted access sites, typically utilised for contamination investigations. The rigs are operated with a 63.5kg drop-weight with an internal winch providing the drilling force, the rig is typically delivered to site in the back of a van, or on a small trailer. Capable of providing in-situ geotechnical testing including both standard penetration testing and dynamic probing.



Once mobilised, a windowless sampler rig stands approximately 2.0m high with an extra 1.0m required during operation. A working area of about 2m by 1m is also required. Maximum drill depth in ideal conditions is 12mbgl, although 5-6m depth is commonly targeted. The operating noise of the Window Sample Rig is 87-96dBA.

Soil samples are retrieved in seamless plastic tubes; once recovered these arisings are logged and photographed at the surface. Following the completion of boreholes gas and groundwater monitoring wells can be installed. Where no monitoring wells are installed, exploratory holes are backfilled with arisings and the surface is reinstated as appropriate.



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2. RESTRICTED ACCESS WINDOWLESS SAMPLING

- SUITABLE FOR VERY RESTRICTED ACCESS DRILLING
- HAND HELD PORTABLE EQUIPMENT
- ALLOWS INSTALLATION OF GAS AND
- ALLOWS GROUNDWATER MONITORING WELLS

Windowless sampling rigs are commonly utilised on sites with specific access constraints due to their relatively small size and working area. However, when standard rig access is not possible, alternative cut down modular rigs or hand held rigs are available.

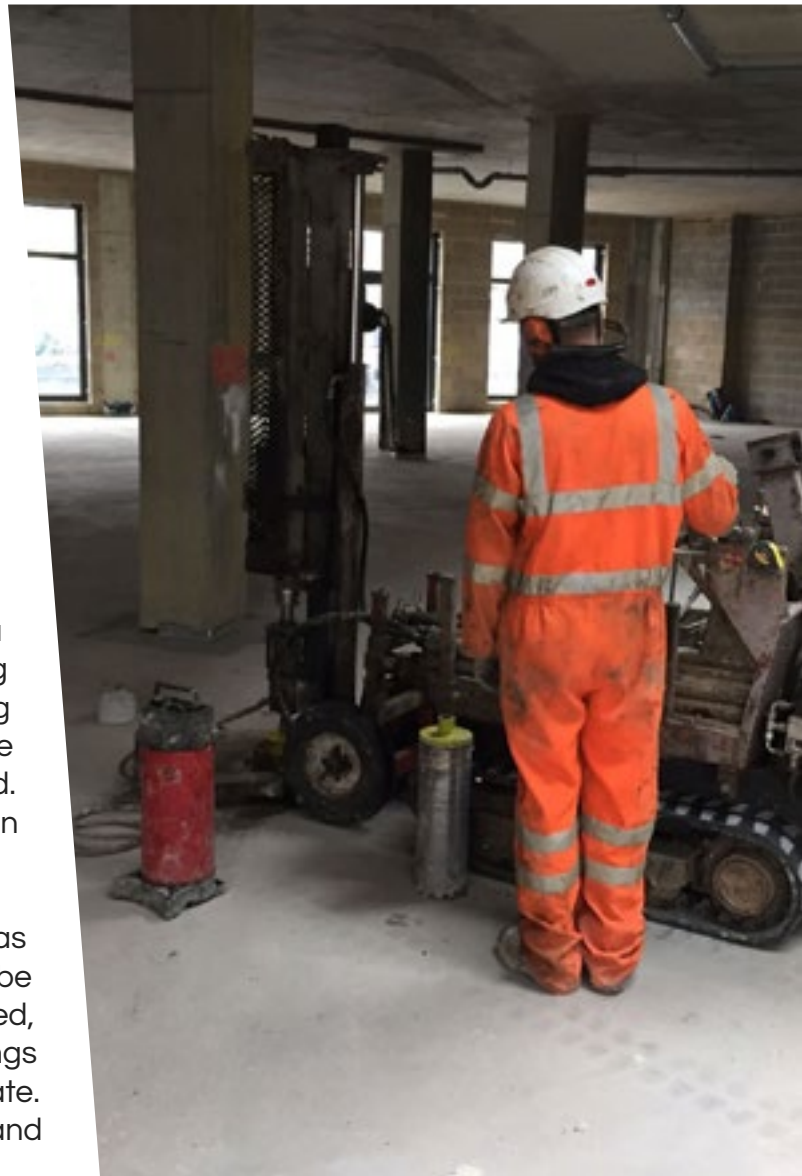
2A. CUT DOWN RIG

Cut down windowless sampling equipment is significantly smaller and more versatile when compared to both standard windowless sampler and cable percussion apparatus. Where no monitoring wells are installed, exploratory holes are backfilled with arisings and the surface is reinstated as appropriate. Cut down windowless sampler rigs are compatible with in-situ geotechnical testing methods including both standard penetration testing and dynamic probing.

2B. HAND HELD

This portable sampling system allows access to the most restricted areas from alleyways to small internal rooms. The drilling system comprises a hydraulic breaker hammer with an adaptor allowing for use with the standard windowless sampling barrels. A power pack and set of hydraulic arms are used to retrieve sample barrels from the ground. The maximum depth achievable is dependent upon ground conditions.

Following the completion of boreholes gas and groundwater monitoring wells can be installed. Where no monitoring wells are installed, exploratory holes are backfilled with arisings and the surface is reinstated as appropriate. In-situ geotechnical testing is not possible with hand held windowless sampling.



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3. RESTRICTED ACCESS CABLE PERCUSSIVE

- DEEP BOREHOLE DRILLING WITH LIMITED ACCESS
- ALLOWS IN-SITU GEOTECHNICAL TESTING
- ALLOWS GAS AND GROUNDWATER
- MONITORING WELLS

Also referred to as a 'narrow access' or 'cut down' rigs; restricted access cable percussive borehole rigs are built in portable sections. These sections (casing/tools/SPT rods) are shorter in size to accommodate restricted access areas. This equipment is typically transported to site using a transit type van and trailer.

The ideal working area required for restricted access borehole drilling is 3.0m x 6.0m and height restrictions vary between 2.5m and 4.5m, dependant on site constraints. The winch unit is 0.75m wide and 1.80m long and can typically navigate most doorways.

The maximum casing depth achievable by this style of cable drilling is 20.0mbgl. Restricted access



cable percussive rigs allow in-situ geotechnical testing by standard penetration tests.

Following the completion of boreholes gas and groundwater monitoring wells can be installed. Where no monitoring wells are installed, exploratory holes are backfilled with arisings and the surface is reinstated as appropriate.

4. CABLE PERCUSSIVE BOREHOLE RIG

- DEEP BOREHOLE DRILLING
- STEEL TRIPOD 'A' FRAME
- ALLOWS IN-SITU GEOTECHNICAL TESTING
- ALLOWS GAS AND GROUNDWATER MONITORING WELLS

Cable percussive boreholes are one of the more common ground exploration techniques used in the UK. These demountable percussive rigs are typically towed to site by a 4x4 vehicle, and operated by a crew of two. This type of exploration is favoured on sites with few or no access restrictions.

The rig consists of a steel tripod 'A' frame with a diesel-powered winch. Once mobilised, the rig stands approximately 6.0m tall and due to its branching



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legs, a typical floor working area of 6.0m² is required. Cable percussive drilling is favoured for the greater depths it can achieve compared to windowless sampler drilling with maximum depths of 40.0m below ground level achievable in ideal ground conditions. Cable percussive rigs also allow in-situ geotechnical testing including standard penetration tests.

Following the completion of boreholes gas and groundwater monitoring wells can be installed. Where no monitoring wells are installed, exploratory holes are backfilled with arisings and the surface is reinstated as appropriate. During operation cable percussive drilling is powered by a diesel engine; due to the nature of this exploration technique intermittent noise is produced, typically at levels between 53 – 115 db.

5. TRIAL PITTING

- SUITABLE FOR SHALLOW SUB-SURFACE EXPLORATION
- MECHANICALLY EXCAPATED TO AID GEOTECHNICAL DESIGN
- IN-SITU HYDROGEOLOGY TESTING
- REMEDIAL EXCAVATIONS
- LANDSCAPING

This form of ground investigation is commonly used to examine shallow sub-surface ground conditions (i.e., geology, hydrogeology, visible/olfactory observations). Pits are completed by a JCB 3CX or tracked excavators. Excavation can also be utilised for soakage testing to inform drainage conditions or as part of remedial work as required.

Minimum access requirements for a typical JCB 3CX is 2.50m width and 3.80m height. The maximum achievable depth for excavators is dependant on ground conditions; typically excavations can extend to approximately 4.0m below ground level.

Following completion, trial pits are backfilled and reinstated by the excavator. Pits are left mounded to account for settling.



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6. ROTARY DRILLING

- DEEP BOREHOLE DRILLING
- ALLOWS IN-SITU GEOTECHNICAL TESTING
- ALLOWS GAS AND GROUNDWATER MONITORING WELLS

The Comacchio GEO602 is a compact, yet very powerful and hugely capable rotary rig capable of forming geotechnical, rotary cored or rotary open boreholes to depths in excess of 250m.

Add 200-300mm to mast height, to allow driller some movement whilst drilling, and to allow for mast positioning in order to accommodate casing height.

The GEO602 rotary drilling rig is transported to site with our in-house 26t beavertail plant truck, this truck also carries all in-hole equipment as well as auxiliary equipment such as compressors and mud recycling equipment.

The rig is supported by an Iveco 7t van and operates many systems, the capabilities of which are outlined below.

The rig can provide continuous cored sample recovery via dynamic sampling and rotary coring either conventionally with T6-116 or T6-146, or with wire-line in the form of Geobor-S.

It can also efficiently drill rotary open holes with the use of PCD and tri-cone NC bits. All systems are supported by either the on-board clean water mist pump, or the triplex 300L/min mud pump.



CONTACT US FOR A QUOTE

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