



STANDARD METHOD STATEMENT - CABLE PERCUSSIVE DRILLING

General – The light cable percussion rig (shell and auger) consists of an engine powered winch and tripod frame, which is towed behind a suitable vehicle, such as a Land Rover. The rig motor is normally of about 9kW, giving a winch pull of up to 2 tonnes. In difficult locations it can be winched into position, and in restricted spaces it can be partially dismantled.

Method

The rig is towed into position and set up using its own winching system. A level working space of at least 3m x 10m is required and a clear height of 6.5m.

The location of the borehole is checked to make sure that it is not situated near to unacceptable services, and a CAT scan will be undertaken along with a hand dug trial pit to a minimum depth of 1.2m.

Boreholes are advanced in soil by the percussive action of the cable tool. The force of the cylindrical tool as it is dropped cuts a plug of cohesive soil. In non-cohesive soils, the hole is advanced by a 'shell' (bailer) which incorporates a clack valve which retains the material. The use of casing is always used in granular soil so that the material is drawn from the base rather than the borehole sides. Obstructions to boring are overcome by fitting a serrated chiselling ring to the base of the percussion tool.

Disturbed samples are taken in plastic bags or pots which are sealed against air or water loss.

Undisturbed samples are taken in cohesive soil usually at 1.0m intervals to 5.0m depth, and then at 1.5m intervals to the full depth of the borehole. The open tube sampler is suitable for firm to stiff clays and weak rock and consists of a 100mm diameter tube (U100), which is capable of taking samples up to 450mm in length, driven by a sliding hammer. The samples are sealed at each end using micro crystalline wax to prevent drying.

Standard penetration tests (SPT's) are generally carried out in non-cohesive soils at similar frequencies to that of undisturbed sampling. A disturbed sample can be recovered by the split barrel or in the case of gravels, the drive shoe replaced by a solid 60 degree cone (CPT).

The basis of the SPT/CPT test consists of dropping a free fall hammer of mass 63.5kg onto a drive head from a height of 760mm. The number of such blows (N) necessary to achieve a penetration of 300mm (after a 150mm seating drive), is regarded as the penetration resistance (N). All strata changes, sampling and testing and any groundwater encountered, are recorded by the driller and submitted to the Engineer.