



GROUND TECHNOLOGY



Cone Penetrometer Testing

Cone Penetration Testing (CPT) is an advanced method of obtaining geotechnical engineering properties of the soil by directly measuring the penetration resistance of the ground, local sleeve friction and pore pressures using electronically instrumented cones. The tests are able to rapidly determine the soil type and layering, allowing an accurate interpretation of the materials encountered. In good conditions on accessible sites it is possible to test between 100m and 150m in a single day. The results obtained can be directly correlated to a number of geotechnical parameters however; soil samples cannot be obtained while measuring penetration resistance. Other methods are therefore required if sampling and direct description of the soil profile is necessary. Samples can be obtained using pushed sampler barrels, but these need to be pushed in discreetly at selected layers.

The testing process involves “pushing” a cone vertically into the ground using hydraulic rams mounted on wheeled drive trucks or track mounted rigs. The cone is pushed into the ground at a constant rate of penetration (20mm per second). An electrical current is utilised to make measurements of resistance at the cone tip and friction behind the cone on the sleeve. Commonly pore pressure (piezocone or CPTu) is also recorded during this process, which allows better interpretation of the data. The measurements are then used to produce a graphical representation of the underlying soils. Pore pressure dissipation tests can be carried out using the piezocone allowing the calculation of soil permeability.

More advanced cones have recently become available which allow a wider range of soil properties and characteristics to be observed and estimated. We are able to provide a range of cone testing services through an approved specialist contractor.