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ENVIRONMENTAL

DATA SHEET IN-SITU TESTING

A number of tests can be carried out on site to test soil parameters in situ.

California Bearing Ratio (CBR)

The CBR is a penetration test for evaluation of the mechanical strength of road subgrades. It consists of causing a plunger of standard area to penetrate a soil sample in order to determine the resistance to deformation under load. As the load is increased, regular readings are taken of load applied against penetration of the plunger. The results give the CBR value for the soil and allow the road pavement to be designed. Considerable cost savings can be made if the results are high.

The equipment is portable and fixed to a JCB or 4 x 4 type vehicle.

Plate Bearing Testing (PBT)

The Plate Bearing Test is most commonly used to measure the short term settlement of road subgrade or building footings under their proposed design load. It consists of a steel plate of known diameter placed on the ground and a load applied by means of a jacking system. A 360 excavator or similar item of heavy plant is used to provide the load to jack up against. Each test might last for a few hours and this method is an economical way to establish useful soil characteristics.

Results are plotted as settlement against load and the following soil parameters can be calculated:

- Modulus of subgrade reaction
- Permanent deformation characteristics
- Shear strength of the soil

The results are checked against the design load settlement criteria for the future land use, and it is possible to make savings in foundation design if the values are consistently high.

On site the set up is very similar to that of the CBR test. A jack and load cell are used in place of the CBR equipment and heavier plant is required to jack up against.

Nuclear Density Testing (NDG)

This test is used to establish the:

- wet density
- dry density
- moisture content

of soils and granular construction materials. Measurement of soil density in situ is most commonly used to assess whether material used as backfill, lining or capping (road and landfill construction for instance) has been adequately compacted.

The site operation is very straightforward, non-destructive with results immediately available, meaning minimal downtime for the contractor.
As this method makes use of low level radiation, site personnel are fully trained and procedures strictly adhered to.

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