SPT CALIBRATIONS

Introduction

Equipe, using its state of the art SPT Analyzer+, provides calibrations and certification compliant to the requirements of the British Standards; BS EN ISO 22476-3 for Standard Penetration Tests and BS EN ISO 22476-2 for Dynamic Probing.

The SPT Calibration can be carried out using our in-house test hole, or can be easily carried out on site. Equipe's experienced engineers will then set up the equipment and provide instant analysis to the site staff. Tests can be performed in holes as shallow as 6m and are carried out typically using 10 blows.

The Standard Penetration Test (SPT) is a widely used soil exploration method for obtaining a relative indicator of cohesive soil strength or density of granular soil. SPT sampling in cohesive soils involves driving a split barrel (spoon) sampler on the bottom of a drill string to recover a disturbed sample whilst in granular soil a solid cone replaces the split spoon. The sampler is driven into the soil by a standard 63.5kg hammer/drop weight falling a distance of 760mm. It is advanced in six 75mm increments and the sum of the blows required to penetrate the last four increments are used to calculate the 'N value'.

It has been demonstrated that the type and operational characteristics of the SPT hammer can have a significant influence on the resulting SPT 'N values'. BS EN ISO 22476-3 requires the energy ratio (Er) (energy imparted by the SPT hammer to the rods compared to the theoretical energy of the hammer) to be recorded and a certificate of calibration provided.

The Energy Ratio (Er)

The influence of different types of equipment on measured SPT N values is well known. The main reasons, as noted in BS EN ISO 22476-3, are that energy losses occur due to friction of the hammer compared to free fall, and during impact between the hammer and the anvil. Clayton (1995) reported energy ratios of between 43% and 85% for tests from eight different countries with a measured value for a UK automatic trip hammer of 73%. BS EN ISO 22476-3 states that the energy ratio of the equipment used has to be known "if the N values are to be used for quantitative evaluation of foundations or comparisons of results".

Calibration Intervals

The British Standards provide a recommended method for measuring the actual energy, calculating the energy ratio and also provides a specification. Measurements are required on an annual basis unless the equipment has been modified, damaged or as requested by the client. Designers may specify more frequent calibrations and, in addition, calibrations at the commencement of large contracts where multiple rigs and SPT equipment are to be utilised would be recommended.

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AGS Association of Geotechnical & Geoenvironmental Specialists