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Abstract

Geotechnical Site Characterization Based on SPT

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For the construction of heavy structures in a site, site characterization is a must. One of the usual problems faced by a geotechnical engineer is to plan properly the site investigation to obtain the site characteristics needed for satisfactory designing the foundations for structures. Subsurface exploration, an essential component of site characterization, is a process of diagnosis that is required to evaluate what constitutes the ground for a particular site and its engineering characteristics. Unfortunately, in some instances, exploration is inadequate and there are difficulties in the interpretation of observations and measurements. These may be attributed to the lack of proper accounting for the determination of the extent and amount of the work such as the vertical sampling distance along a borehole, the spacing of boreholes and the minimum number of tests and boreholes required for designing economic, safe and reliable foundations. In the light of this fact, it requires proper accounting for the inherent natural variability of soils, the uncertainty of measurement with improper control of equipment and operating procedures. In practice, results of widely used in-situ soil tests are commonly interpreted in an empirical way and this leads to an additional complication in interpretation owing to the uncertainty associated with the conversion of test measurements to design soil parameters.

In view of these facts, it is necessary to complement the soil exploration process with a procedure that considers the uncertainties and variabilities involved in geotechnical information. Probabilistic methods provide a formal basis for the

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incorporation of uncertainties in making decisions. In this study, a quantitative approach on the basis of probabilistic methods had been developed based on large number of standard penetration tests (SPT), carried out at 12 sites of Macau. Proposals were made for determining the extent and amount of work, the statistical parameters of soil properties, for identifying and quantifying the main uncertainties involved in the estimation of design soil properties. It had been concluded from this investigation that probabilistic methods are useful to formally account for different kinds of uncertainties and variabilities in soil exploration for planning an effective soil exploration programme and characterizing soil properties.	11
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