

Parameters Identification of Granular Soils around PMT Test by Inverse Analysis

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Abstract : The successful application of in-situ testing of soils heavily depends on development of interpretation methods of tests. The pressuremeter test simulates the expansion of a cylindrical cavity and because it has well defined boundary conditions, it is more unable to rigorous theoretical analysis (i. e. cavity expansion theory) than most other in-situ tests. In this article, and in order to make the identification process more convenient, we propose a relatively simple procedure which involves the numerical identification of some mechanical parameters of a granular soil, especially, the elastic modulus and the friction angle from a pressuremeter curve. The procedure, applied here to identify the parameters of generalised prager model associated to the Drucker & Prager criterion from a pressuremeter curve, is based on an inverse analysis approach, which consists of minimizing the function representing the difference between the experimental curve and the curve obtained by integrating the model along the loading path in in-situ testing. The numerical process implemented here is based on the established finite element program. We present a validation of the proposed approach by a database of tests on expansion of cylindrical cavity. This database consists of four types of tests; thick cylinder tests carried out on the Hostun RF sand, pressuremeter tests carried out on the Hostun sand, in-situ pressuremeter tests carried out at the site of Fos with marine self-boring pressuremeter and in-situ pressuremeter tests realized on the site of Labenne with Menard pressuremeter.

Keywords : granular soils, cavity expansion, pressuremeter test, finite element method, identification procedure

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