

砂土液化势剪切波速简化判别法的改进

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摘要 结合压电陶瓷弯曲元波速测试技术开展了饱和标准砂的不排水循环三轴试验, 并根据试验结果改进了以往提出的利用剪切波速进行砂土液化势判别的简化方法。这种方法本质上基于砂土抗液化剪切强度与弹性剪切模量之间良好的相关性。用改进后的方法全面评价了26次地震、70多个液化场地的液化势, 并与国内外其他液化势简化判别法的判别结果作了比较。分析结果表明, 改进后的简化方法的评价结果与现场震害调查数据更趋一致。最后, 通过一个实例分析演示了利用该改进方法进行土层液化势判别的一般步骤。该改进方法仍有待于深入研究, 尤其是对密实砂土地地在强震下的液化评价, 需要进一步的试验和现场数据加以佐证。

关键词 [土力学](#); [液化](#); [砂土](#); [剪切波速](#); [循环三轴试验](#); [简化方法](#); [弯曲元](#)

分类号

IMPROVEMENT OF SIMPLIFIED PROCEDURE FOR LIQUEFACTION POTENTIAL EVALUATION OF SANDS BY SHEAR WAVE VELOCITY

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Abstract

Evaluation of soil liquefaction potential is an important aspect of geotechnical engineering practice; and several types of evaluating procedures have evolved over the past 30 years. In the current study, the simplified procedure using shear wave velocity measurements for liquefaction potential assessment was improved from the experimental results of undrained cyclic triaxial tests on saturated sands with shear wave velocity measured by bender elements. This improved simplified procedure establishes its correctness and feasibility essentially upon the warranted correlation between liquefaction resistance and elastic shear modulus of sandy soils, which is almost irrespective of soil types and confining pressures. Intensive evaluation of 26 earthquakes and more than 70 measurement sites shows that, the evaluation results using this improved simplified procedure are more consistent with the case history data than those from other evaluation methods within certain ranges of shear wave velocity. A case study is provided to illustrate application of the improved procedure. Additional studies are needed, especially for evaluating the liquefaction resistance of dense soil deposits shaken by stronger ground motions so as to further validate this improved simplified procedure.

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