

## 非饱和土强度随含水量的变化

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**摘要** 吸力的量测和计算比较困难, 而含水量的分布在工程中却容易确定, 在非饱和土强度的研究中, 选择含水量代替吸力, 研究非饱和土强度随含水量的变化, 具有重要的实用价值。首先, 在改进的普通三轴仪上进行非饱和土的强度试验。试验中控制含水量不变, 同时保证气压消散, 以模拟工程施工期间气压消散快、水压消散慢的工程实际特点。其次, 根据试验结果分析含水量对非饱和土强度的影响, 建立非饱和土的实用强度公式。试验结果表明: 随着含水量的增大, 强度明显减小, 表明含水量对强度的影响较大; 且在一定含水量范围内, 强度指标随含水量的增大线性减小, 并在此基础上建立了引入含水量的非饱和土实用总应力强度公式。公式运用时由土层含水量的分布确定强度, 避免吸力的量测和计算的困难, 简单实用。

**关键词** [土力学](#); [强度](#); [含水量](#); [非饱和土](#); [三轴试验](#)

分类号

## VARIATION OF UNSATURATED SOIL STRENGTH WITH WATER CONTENTS

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### Abstract

The variation of the strength of unsaturated soil with water contents is studied; and the practical strength formula is developed. To study the relationship between the strength and the water content, it is necessary to keep the water content constant in the test. The pore air pressure dissipates quickly and the pore water pressure does not have such behavior. To study the problem, it is necessary to guarantee that the pore air pressure has dissipated completely in the test, and to adjust the general triaxial test apparatus to strength tests of unsaturated soil. The test procedure and control measures to realize the above two test aims are put forward. Secondly, based on the test results, the influences of water contents on strength are analyzed. It can be easily found that the cohesion and the angle of internal friction of unsaturated soil decrease linearly with the increase of water content. Then, the total stress strength formula of unsaturated soil is established. If the water content distribution of soil strata is known, the strength can be easily obtained by the presented formula, i.e. the difficulty of measuring and calculating suction pressure can be avoided. For the water content can be easily obtained, the presented formula is convenient and practical.

**Key words** [soil mechanics](#); [strength](#); [water content](#); [unsaturated soil](#); [triaxial test](#)

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