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土石混合料干密度和粒度的强度效应研究

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收稿日期 2007-6-5 修回日期 2007-6-23 网络版发布日期 2008-1-23 接受日期 2007-7-15

摘要 将密度、砾石含量和最大粒径这3个指标作为高速公路路堤室内试验的控制条件和计算分析的基础, 进行一系列大型三轴试验研究及控制试验条件与抗剪强度关系的计算分析。试验和计算结果表明: 土石混合料的骨架作用明显, 抗剪强度主要受粗颗粒、细颗粒和粗细颗粒的共同作用影响; 土石混合料的抗剪强度随试验干密度的增加有所提高, 咬合力随砾石含量p5值的增加和最大粒径的增大而降低, 当p5 为50%~60%时抗剪强度最低, p5值的最佳范围为65%~70%; 最大粒径最佳范围为40~50 mm, 考虑剔除粒径大于50 mm的颗粒会给实际工程施工造成困难, 故工程应用中应严格控制压实度。

关键词 [土力学](#); [土石混合料](#); [干密度](#); [砾石含量](#); [最大粒径](#)

分类号

STUDY ON STRENGTH EFFECTS OF DRY DENSITY AND GRANULARITY ON EARTH AND ROCK MIXTURES

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Abstract

As the control conditions of laboratory test and the basis of numerical analysis for the three indexes, i.e. the density, the gravel content and the maximum grain, the laboratory tests on series large-scale triaxial test are carried out. The results are as follows: (1) the framework action is prominent and the shear strength is mostly influenced by coarse grain, fine grain and the actions of coarse grain and fine grain on earth and rock mixtures; (2) the shear strength of earth and rock mixtures is enhanced with the test dry density increasing, but the interlocking force decreases with the p5 increasing and the maximum grain increasing; (3) because the shear strength value is the minimum when the p5 varies from 50% to 60%, it is advised to control the p5 value varying from 65% to 70% in filling compound embankment which is the optimum range for the p5 value; and (4) because of the shear strength value is maximum when the maximum grain is in the range of 40 mm to 50mm, it is better to control the maximum grain size in this range. Therefore, the condition that the maximum size is over 50 mm should be noted, especially the compaction degree should be strictly controlled.

Key words [soil mechanics](#); [earth and rock mixtures](#); [dry density](#); [gravel content](#); [maximum grain](#)

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