

黏土与EPS颗粒混合轻质土的动强度特性 试验研究

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摘要 通过一系列的室内动三轴试验研究黏土与EPS颗粒混合轻质土(LCES)的动强度特性。首先确定压应变达到5%是适合LCES的动力破坏标准, 然后着重研究围压、水泥含量和EPS掺入比对LCES动强度特性的影响。试验结果表明, 随着围压和水泥含量的增大, LCES的动强度增大, 但围压对LCES动强度的影响程度随着水泥含量的增大而逐渐减小; 随着EPS掺入比的增大, LCES的动强度先增大后减小, 所以对于LCES的动强度来说, 可能存在一个最佳EPS掺入比。水泥和EPS颗粒的掺入对LCES的动强度指标 c_d 的提高贡献相当大, 而对 j_d 的提高作用相对较小。LCES动强度曲线 t_d-N_f 符合乘幂函数关系, 在综合考虑围压、水泥含量和EPS掺入比的基础上, 将LCES的动强度曲线进行较好的归一化, 并得到LCES的动强度公式。

关键词 [土力学](#); [黏土与EPS颗粒混合轻质土](#); [动三轴试验](#); [破坏标准](#); [动强度](#)

分类号

EXPERIMENTAL STUDY ON DYNAMIC STRENGTH PROPERTIES OF LIGHTWEIGHT CLAY MIXED WITH EPS BEADS SOIL

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Abstract

A series of laboratory dynamic triaxial tests are carried out to study the dynamic strength properties of lightweight clay mixed with expanded polystyrene beads soil (LCES). Firstly, the material will be in failure when the compressive strain reaches 5%, which can be considered to be a suitable dynamic failure criterion of LCES, and then the effort is focused on the confining pressure, cement content and EPS content effect on the dynamic strength properties of LCES. The test results indicate that the dynamic strength of LCES increases with the increasing confining pressure and cement content, however, the effect of confining pressure on the dynamic strength declines when the cement content increases. The dynamic strength of LCES initially increases and then decreases with the increase of EPS content, so LCES may have an optimal EPS content for the dynamic strength.

Cement and EPS have considerable effects on the increase of the dynamic strength parameter of LCES, but they have few effects on the increase of the parameter j_d . The relationship of dynamic shear strength and cyclic number(t_d-N_f) can be simulated by the power function properly. By considering synthetically the influences of confining pressure, cement content and EPS content, dynamic shear

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strength curves of LCES are normalized, and the dynamic strength formula is obtained.

Key words [soil mechanics](#); [lightweight clay mixed with EPS beads soil](#); [dynamic triaxial test](#); [failure criterion](#); [dynamic strength](#)

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