■ 论文摘要

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碎石桩复合地基复合模量极限值分析

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摘　要：针对复合地基的复合模量是计算复合地基沉降的关键参数，但求解出完全符合实际的精确解较困难的情况，在分析碎石桩复合地基复合模量现有计算方法及计算中存在的问题基础上，将复合地基看成由桩和土组成的复合材料，从整体上考虑，避免了桩与土之间复杂的相互作用机理分析，并采用弹性理论中最小势能原理和最小余能原理计算复合模量，推求出复合模量上、下限值计算公式。此外，对影响复合模量上、下限值的几个主要参数如桩土压缩模量、土体泊松比和置换率等进行分析。研究结果表明：碎石桩复合地基复合模量极限值随着土体模量和置换率的增大而增大，并且上限值是下限值的1.1~1.4倍，工程实例验证了所求极限值范围的合理性。

关键字：碎石桩复合地基；复合模量；能量原理；扩大系数

Limit value of composite modulus of gravel pile composite foundation

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Abstract: Based on the fact that the composite modulus of composite foundation is a key parameter in settlement calculations, and that it is hard to obtain precise solutions that are completely conformed to reality, the composite modulus of gravel pile composite foundation and its disadvantages were calculated based on the discussion of the existing method, the calculation formula of the limit value of the composite modulus was obtained, the minimum potential energy principle and the principle of minimum complementary energy were applied, and the gravel pile composite foundation was treated as a composite material composed of pile and soil in this process to avoid the analysis of complex interaction between piles and soil. Moreover, several factors which affect the limit value of the composite modulus such as compression modulus of pile and soil, Poisons's ratio of soil, replacement ratio were analyzed. The results show that the limit value increases with the increase of soil modulus and replacement ratio, and the upper value is 1.1 to 1.4 times of the lower value. The reasonableness of the limit value calculated is verified by practical engineering projects.

Key words:gravel pile composite foundation; composite modulus; energy principle; expanded coefficient