岩石力学与工程学报 2005 24 (2005-S2): 5835 ISSN: 1000-6915 CN: 42-1397/O3

软土基坑复合土钉支护性状分析

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收稿日期 2004-10-26 修回日期 2005-1-26 网络版发布日期 2008-3-21 接受日期 2004-10-26

摘要 在阐述福州市区地层分布特点及类型的基础上，提出软土地基进行复合土钉支护必须考虑地层结构的影响，并借助有限元对其工作性状进行数值模拟。通过参数敏感性分析，研究和比较不同软土结构对于不同支护条件的位移响应，得出双层基坑采用水泥搅拌桩、三层基坑采用木桩进行复合支护等有实际意义的结论，并对软土基坑的工作机理和参数取值加以探讨，最后对2个工程实例进行优化设计，获得满意结果。

关键词 基坑工程；地层结构；软土基坑；复合土钉支护；前置桩

分类号

ANALYSIS OF BEHAVIOR FOR COMPOSITE SOIL NAILING SUPPORT IN SOFT CLAY PIT

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Abstract

Based on the analysis of the stratum¢s location and composition in Fuzhou city，it is found that stratum structure is important and can be divided into two types. In order to get a further acquaintanceship about the pit¢s working behavior in soft clay，a planar strain finite element programme is employed for numerical analysis. Mohr-Coulomb model is used to simulate the soil¢s stress and strain relation. A series of calculations via FEM are executed for the displacement response of foundation pits when the type of stratum structure，length or obliquity of soil nailing are changed. Compared with the pit¢s parietal movement under different conditions，some significant conclusions are obtained that the prepositive pile is the most important affecting factor for composite soil nailing. The cement mixed pile should be chosen for the prepositive pile of double stratum，and timber pile for three stratum. Because of the clay¢s weaker properties and wider sliding route than those of the others，the length of the soil nailing should be added to two times of the pit¢s depth which is different from that of those located in favorable soil. Finally，two cases are optimized based on above analysis，indicating a good identicalness between the results of calculation and measurement.

Key words pit engineering；stratum structure；soft clay pit；composite soil-nailed support；prepositive pile

DOI:

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