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孔隙水压力测试和分析中存在的问题及对策

张功新1，2，莫海鸿1，董志良2

(1. 华南理工大学 土木工程系，广东 广州 510640；2. 广州四航工程技术研究院，广东 广州 510230)

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摘要　针对目前几种常用的孔压计封孔方法存在的问题，提出一种新的孔压计封孔技术，并在广州南沙一真空预压加固软基工程中进行对比试验。实测结果表明，采用传统塌孔方式封孔埋设孔压计难于封堵，上下孔压计容易连通，不同深度的孔压差几乎一致，测试结果误差较大；采用新的封孔装置可有效地防止孔压计上下连通，不同深度的孔压差变化呈现明显的差异性，测试结果较为准确，且施工方便，孔压计定位准确。同时，还分析土体压缩和地下水位的变化对孔隙水压力的影响：土体压缩和地下水位变化越大，对孔隙水压力的影响就越大。土体压缩和地下水位变化对孔隙水压力的影响可达20 kPa，因此在研究孔隙水压力消散规律或超静孔隙水压力分布模式时，须扣除因土体压缩和地下水位的变化而引起的孔隙水压力变化值。

关键词　土力学；真空预压；孔隙水压力；封孔装置；孔压计

分类号

ISSUES AND CONTERMEASURES FOR MEASUREMENT AND ANALYSIS OF PORE WATER PRESSURE

ZHANG Gongxin1，2，MO Haihong1，DONG Zhiliang2

(1. Department of Civil Engineering，South China University of Technology，Guangzhou，Guangdong 510640，China；2. Guangzhou Sihang Institute of Engineering Technology，Guangzhou，Guangdong 510230，China)

Abstract

Based on several traditional plugging methods in pore water pressure measurement with technical difficulties，a new plugging technique is presented，and some in-situ contrast tests in a soft soil engineering consolidated by vacuum preloading in Guangzhou Nansha was performed. Test results show that it is difficult to plug the hole among the piezometers using the traditional hole-breakdown method because the piezometers will not be separated and differences of the pore water pressure in different depths will be the same，which will cause great measure errors. The newly employed plugging device can effectively be separated，and the differences of the pore water pressure in the different depths will not be same. So the test results with more accuracy can be obtained，and it is convenient for construction and the positions of piezometers can be accurately controlled. The influences of variations of the settlement and groundwater level to pore water pressure are analyzed. The greater variations of the settlement and groundwater level are，the greater variation values of pore water pressure are. Test results also show that the variable values of pore water pressure caused by the variations of settlement and groundwater level can reach to 20 kPa，which should be deducted when analyzing the dissipation of the pore water pressure or the distribution mode of excess pore water pressure.

Key words soil mechanics；vacuum preloading；pore water pressure；plugging device；piezometer

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