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Causes Analysis of Vacuum Consolidation Failure to Soft Foundation Filled by Newly Dredged Mud

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Abstract : For soft foundation filled by newly dredged mud, after improved by Vacuum Preloading Technology (VPT), the soil strength was increased only a little, the effective improved depth was small, and the ground bearing capacity is still low. To analyze the causes in depth, it was conducted in laboratory of several comparative single well model experiments of VPT. It was concluded: (1) it mainly caused serious clogging problem and poor drainage performance in vertical drains of high content of fine soil particles and strong hydrophilic minerals in dredged mud, too fast loading rate at the early stage of vacuum preloading (namely rapidly reaching-80kPa) and too small characteristic opening size of the filter of the existed vertical drains; (2) it commonly reduced the drainage efficiency of drainage system, in turn weaken vacuum pressure in soils and soil improvement effect of the greater partial loss and friction loss of vacuum pressure caused by larger curvature of vertical drains and larger transfer resistance of vacuum pressure in horizontal drain.

Keywords : newly dredged mud, single well model experiments of vacuum preloading technology, poor drainage performance of vertical drains, poor soil improvement effect, causes analysis
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