武汉某小区地下室基坑支护 B’C 段双排桩设计

摘要

目前，随着我国国民经济高速发展，城市人口数量急剧增加，为了缓解土地资源压力，城市的建筑物越建越高，建筑基坑也越来越深。这就使得基坑的支护工程不断面临新的技术挑战。基坑开挖的过程即是一个土压力卸载过程，在卸载后基坑侧壁在主、被动土压力的作用下可能会引起土体倾覆造成工程事故。基坑支护工程即是为保护地下主体结构的安全施工，降低对周围已有建筑的影响，对基坑侧壁和周围现场进行临时的支撑、加固以及对地下水的降排等措施。

本文以武汉市某小区地下室基坑项目为参考实例，对该基坑 B’C 段进行支护设计。通过勘察现场环境，对拟建项目的工程地质条件进行评价；通过查阅现行行业规范，比选支护方案，最终确定对该段采用双排桩支护形式。在设计过程中本文选用经典土力学中的朗肯土压力理论和布鲁姆法为计算模型，计算求得主动土压力、被动土压力、最大弯矩、嵌固深度等参数，并对支护桩结构进行设计，最后借助相关软件分析对桩身配筋基坑稳定性进行验算。

关键词： 基坑支护；双排桩；布鲁姆法；

ABSTRACT

At present, with the rapid development of China's national economy, the number of urban population has increased dramatically. In order to relieve the pressure of land resources, the building of the city is getting higher and higher, and the excavations are getting deeper and deeper. This makes the project for excavation-protection continue to face new technical challenges. The excavation process of the foundation pit is a process of unloading earth pressure. After unloading, the sidewall of the excavation may be overturned to cause a engineering accident under the action of active and passive earth pressure. Retaining and protection for excavation is to protect the safety of the underground main structure, reduce the impact on the surrounding buildings, and temporarily support and reinforce the groundwater and the surrounding site.

This paper takes the excavation of a community building basement in Wuhan as a reference example, and design the B'C section of the excavation. By surveying the surrounding around excavation, we evaluated the engineering geological conditions; by consulting the current industry norms and selecting the support plan, it is finally determined that the double-row-piles wall support form is adopted for the segment. This paper decide to choose the Rankine earth pressure theory and the Blum method in the classical soil mechanics as the calculation model, and calculates the parameters such as active earth pressure, passive earth pressure, maximum bending moment and embedded depth, and the supporting piles. The structure is designed, and finally the stability of the pile foundation reinforcement pit is checked by means of relevant software analysis.

Key words: retaining and protection for excavation; double row pile; Blum method

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