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支撑位置对基坑整体稳定性的影响

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摘要 摘要: 基坑稳定性是岩土工程中的主要研究内容之一, 随着高层建筑的增多及城市地铁的不断兴建, 对基坑工程的要求越来越高。在基坑施工中由于环境条件或施工等因素的影响, 需要调整支撑的位置, 以深基坑工程为研究对象, 借助弹塑性有限元分析软件, 重点研究支撑位置的变化对整个支护体系内力和变形的影响规律, 具体分析支撑位置的选取与支护体系内力和变形的关系。

关键词 [关键词: 土力学](#) [深基坑](#) [支撑](#) [支护体系](#) [变形](#)

分类号

STABILITY ANALYSIS OF FOUNDATION PIT WITH POSITION

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Abstract

Abstract: The retaining system of a foundation pit is a temporary structure. Retaining piles and continuous concrete walls have been widely used for simpler bearing mechanism with higher excavation efficiency and lower cost. Especially, they have been used for spacious foundation pit with complicated shapes. However, it is reported that 43.86 percent of the foundation pit were caused by improper design method, unstable bracing system and ignoring stability analysis of foundation pits. Accordingly, optimum design of a foundation pit and the bracing system is an efficient method to avoid the pit failure and reduce project cost. As an example, a deep foundation pit has been analyzed by means of elastoplastic finite element method. Stability analysis of the pit is performed with changing the positions of the braces. More attentions have been paid to the deformation and stress of the retaining structure and strength in the braces. Analytical results show that the bracing position change may bring little effect on stress ratio in soils, but great effect on the position and value of the maximum displacement in the retaining wall. The maximum bending moment in the retaining wall will change with the bracing position. The axial force in the brace is sensitive to the bracing position. When the second brace is moved upwards, the axial force in the first layer decreases and the force in the third layer increases with a ratio of 11%/m. While the second brace is moved upwards, the axial force in both the second brace and the third brace decreases slowly with a ratio of 4%/m and 5%/m, respectively; and the axial force in the first brace is keeping increasing by a ratio of 30%/m.

Key words [Key words: soil mechanics](#) [deep foundation pit](#) [bracing](#) [retaining structure](#) [deformation](#)

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