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重大工程实践

福州轨道交通建设中的岩土工程问题

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摘要:

由于福州盆地工程地质条件的复杂性以及隧道工程的特殊性,在福州轨道交通建设过程中将遇到大量环境岩土工程问题。主要的环境岩土工程问题有:(1)隧道掘进范围内的承压含水层。承压含水层富水性、透水性强,由于开挖深度大,必须考虑下部承压水的影响,避免产生基坑突涌问题。砂砾卵石层直接覆盖于基岩裂隙热水上,受热水构造带高温热水的直接补给以及热传导,地下轨道交通建设对地热场是否存在影响以及地热对轨道交通的影响需要深入研究。(2)软土的大变形与低强度。导致地基失稳与土体结构强度破坏。(3)深大基坑开挖施工引发的可能灾变。基坑开挖易产生滑塌、流泥、突水(涌)、地表沉陷等问题,必须采取有效的支护措施,避免基坑失稳而影响工程安全及周边环境。对这些环境岩土工程问题,应加强勘察新技术的应用,查明建设场地岩土工程地质条件;采用人工地层冻结法、桩基托换技术进行施工;开发和利用适合本地区岩土条件的新技术、新工艺,如新型桩、新的止水、降水措施等基坑支护新技术,以及采用信息化施工新技术。

关键词: 福州轨道交通 工程地质条件 岩土工程问题

GEOTECHNICAL ENGINEERING PROBLEMS IN FUZHOU SUBWAY CONSTRUCTION

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Abstract:

Due to the complexity of engineering geological conditions and particularity of tunnel projects in Fuzhou Basin, the corresponding environmental geotechnical problems are emerged in the process of construction for Fuzhou rail transit. The main environmental geotechnical engineering problems are: (1) the confined aquifer within the scope of tunneling boring: The water-bearing capacity and hydraulic conductivity of confined aquifer are strong. As the excavation is deep, the influences on lower confined water must be considered, so that inrush of foundation pit may be avoided. The gravel pebble bed is directly covered on the hot water of bedrock fissure, and it is directly supplied and conducted by high-temperature hot water at the hot water structural belt. The issues, whether the construction of underground rail transit brings impact on geothermal field and what influence does geothermy bring to rail transit, need to be further studied. (2) Large deformation and low intensity of soft soils lead to instability of foundation and damage of the soil structure strength. (3) Deep and large excavation for foundation pit may cause the disasters. The excavation for foundation pit is easy to bring the problems, such as slump, mudflow, water inrush, surface subsidence, etc., so the effective preventive measures should be adopted to avoid the impact on engineering safety and surrounding environment. For these environmental geotechnical problems, new technologies for investigation shall be strengthened to find out geological conditions of the geotechnical engineering at building site; the ground freezing method and technology of pile underpinning shall be introduced for the construction; the new technologies, which are suitable for geotechnical conditions in the region, shall be developed and adopted, such as new piles, new water-seal, ground-water lowering measures and other foundation pit support

technologies as well as new technology for information construction.

Keywords: Fuzhou rail transit Engineering geological conditions Geotechnical engineering problems

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