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浅层地能开采中土体的热湿迁移机制及力学性状研究综述与展望

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REVIEW AND PROSPECT OF HEAT AND MOISTURE MIGRATION MECHANISM AND MECHANICAL BEHAVIOR OF SOIL IN SHALLOW GEOTHERMAL ENERGY EXPLOITATION

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- 摘要
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全文: PDF (499 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 浅层地能的开采是与岩土介质相关的能量交换过程。本文从岩土工程应用的角度,简述了浅层地能开采中与岩土体相关问题的国内外研究现状,指出了目前存在的问题并进行了分析和展望; 在此基础上,凝练出了3个主要的科学问题,即换热过程岩土体热湿迁移机理、岩土层地质构造对热交换的影响以及热交换对岩土力学性质的影响,并对它们的具体研究内容进行了详细的分析。论文的分析成果对于掌握浅层地能开采对土体力学性状的影响,合理开发利用浅层地能,实现能源的可持续发展具有重要的理论和现实意义。

关键词: 浅层地能 热湿迁移 力学性状 岩土介质

Abstract: The exploitation of shallow geothermal energy is the energy exchange process relating to the geotechnical medium. In the view of geotechnical engineering application, this paper briefly elaborates the present domestic and international research about geotechnical-related issues during shallow geothermal energy exploitation. It points out the existing problems and the development orientation. Furthermore, it presents three key scientific issues. They are heat and moisture migration mechanism of soil in heat transfer process, effect of geological structure on heat transfer and effect of heat transfer on mechanical properties of soil. The paper also analyzes their detailed research contents. It points out the great theoretical and practical significance for understanding effect of shallow geothermal energy exploitation on mechanical behavior, rational development and utilization of shallow geothermal energy, and the energy sustainable development.

Key words: Shallow geothermal energy Heat and moisture migration Mechanical behavior Geotechnical medium

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