

论文

高水压下基岩冻结壁设计方法

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摘要:

首先提出了高水压基岩冻结在冻结壁和井壁设计方面存在的问题; 其次回顾了冻结法凿井中冻结壁厚度设计理论的发展, 客观地揭示了井筒井壁内外分层的力学原因, 以及基岩冻结壁设计方面所需考虑的基本问题; 第三, 探讨了包神公式设计冻结壁的载荷性质, 及与冻结壁外缘载荷的关系, 剖析了冻结壁与井筒的几何尺寸、刚度等因素对冻结壁外缘载荷的影响; 第四, 深入研究了采用拉麦和包神公式进行冻结壁弹性设计的力学条件; 第五, 定量分析了井筒冻结壁弹性设计的深度范围; 最后探讨了冻结基岩许用强度、剪切模量之比等参数对设计冻结壁厚度的影响。

关键词: 高水压 冻结壁设计 冻结法凿井 含水基岩 冻结压力

Design method of freezing rock wall under high water pressure

Abstract:

Firstly put forward the problems existing in the thickness designation of freezing wall and shaft lining related to high water pressure of porous rock of shaft sinking with Artificial Ground Freezing Method(SS AGF); Then, reviewed the theory development of thickness designing of freezing wall, accordingly, the reasons of two layers of the shaft lining were revealed in mechanical principal and the basic problems concerned necessary were presented; Third, the character of loader in "Baoshen" formula were studied and its complicated relationship with the outer loader of freezing wall, further the factors such as the dimension and rigidity of freezing wall and lining influencing the direct loader on freezing wall were analyzed, etc.; Fourth, the conditions of the elastic design of freezing wall using "Lame" and "Baoshen" formula were thoroughly discussed; Fifth, the shaft depth limits of elastic design for freezing wall were quantificationally studied; Finally, the allowance compressive strengths, the ratio of shear modulus of freezing wall and enclosure rock related to the thickness designing of freezing wall were discussed.

Keywords: high water pressure; frozen wall design; ground freezing methods of shaft sinking; water bearing rock; frozen wall pressure

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