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隧道地下水处治的设计理论及方法研究

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RESEARCH ON DESIGN THEORY AND METHODOLOGY FOR TUNNEL GROUNDWATER TREATMENT

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全文: PDF (3028 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 隧道施工地下水的处治问题一直困扰着隧道工程界,对地下水作用的认识仍未达成共识,为此需要从概念上和方法上对本问题进行深入研究。本文在国内外研究现状分析基础上,开展了隧道施工对地下水渗流变化的影响分析、隧道水压力物理模型试验研究、隧道衬砌水荷载及其相关问题的数值分析,提出针对不同防排水模式的水荷载计算模式、隧道地下水处治的理念和方式。主要创新点如下:明确提出高水压的概念,建立隧道衬砌水压力计算的概念模型,提出针对隧道不同埋深段及地下水发育状况采取不同处理策略的隧道防排水原则,研究成果为高压富水隧道设计提供了理论依据。

关键词: 隧道 施工 地下水压力 处治 防排水

Abstract: The problem of underground water treatment in tunnel construction had plagued tunnel engineering community for a long time. The understanding of underground water action mechanism had not reached a consensus. So it needs to deep study on this issue from concept to methodology. This paper is based on the analysis of the research status. The impact analysis of tunnel construction on the changes in groundwater seepage is carried out. The physical model tests of the tunnel water pressure is done. Numerical analysis of tunnel lining water load and its associated problems are carried out. Then, the tunnel water load calculation model is proposed under different anti-drain modes, with tunnel groundwater treatment concepts and methods. The main innovation are as follows: a) the concept of high water pressure is clearly put forward, b)the conceptual model of the tunnel lining water pressure calculation, c)the tunnel waterproofing and drainage principles to adopt different processing strategies for different tunnel depth segments and groundwater development status. The research result provides a theoretical basis for design of high pressure water tunnel.

Key words: Tunnel Construction External water pressure Treatment Waterproofing and drainage

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