

单洞双层地铁隧道施工力学行为

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摘要 地铁隧道为避开沿线高大建筑物密布的桩基, 部分段落需要采用暗挖法施工的单洞双层隧道通过, 而此时地铁隧道穿越的地层条件复杂, 围岩极其软弱, 地下水位高, 且隧道埋深较浅, 其力学行为将和单个隧道大不相同。通过建立有限元模型, 对软弱地质条件下单洞双层地铁隧道无临时横联和有临时横联的施工过程进行数值模拟, 研究隧道各施工阶段的稳定性及支护结构的安全性, 并对隧道洞周位移的计算值与实测值进行比较。结果表明, 只有增加临时横联才能保证单洞双层地铁隧道的施工安全, 且下洞施工和拆除临时横联是施工的关键工序。

关键词 [隧道工程; 单洞双层; 地铁隧道; 临时横联; 有限元; 施工力学](#)

分类号

CONSTRUCTION MECHANICAL BEHAVIOR OF METRO TUNNEL WITH SINGLE CAVERN AND DOUBLE-LAYER

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Abstract

In order to avoid the dense pile foundations of line-plot tall buildings, parts of metro tunnel need to be constructed by single cavern and double-layer. When the stratum condition is complex, surrounding rock is weak, groundwater level is high and embedded depth of the metro is shallow, and the metro's mechanical behavior will be entirely different from that of a single tunnel. The construction process of metro tunnel with single cavern and double-layer with and without temporary cross-link have been simulated numerically by constructing finite element model under weak geological conditions; and the stability and security of support structure in construction process have been studied. The comparison between the calculated displacement of tunnel and the actual measured one has been conducted. The result indicates that it is necessary to increase two-track temporary support in order to assure construction security of the metro tunnel with single cavern and double-layer; and the construction of the below cavern and the removal of temporary cross-link are the key procedures during construction of tunnel.

Key words [tunnelling engineering; single cavern and double-layer; metro tunnel; temporary cross-link; finite element; construction mechanics](#)

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