Study on Seepage Control for the Foundation Pit of Shield Tunnel No. 2 Transition Section in Shanghai Metro Chongming Line Postprint

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Abstract

With the rapid development of urban rail transit construction, the utilization and development of underground space is increasing. Water leakage in underground structures not only affects the normal operation of buildings and reduces the surface aesthetic quality, but long-term leakage can also lead to corrosion of structural reinforcement, compromising structural safety. Therefore, controlling water leakage during structural construction is of paramount importance. This paper presents the No. 2 shield tunnel conversion section of Shanghai Rail Transit Chongming Line as a case study, describing measures including non-destructive leakage detection of diaphragm walls, optimization of structural backfilling procedures, and installation of through-wall embedded parts for drainage in the inner lining wall. These measures significantly reduce the risk of structural water leakage, ensure project quality, and provide a reference for similar underground structure water leakage control in the future.

Full Text

Preamble

Study on Seepage and Leakage Water Control of the Foundation Pit at the Shield Transition Section of Line 2, Chongming Line, Shanghai Metro

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Abstract

With the rapid development of urban rail transit construction, the exploitation and utilization of underground space has become increasingly extensive.

Seepage and leakage in underground structures not only impair normal operation and degrade surface aesthetic quality, but also cause steel reinforcement corrosion over time, compromising structural safety. Consequently, controlling seepage and leakage during construction is of paramount importance. This paper presents a case study of the shield transition section of Line 2, Chongming Line, Shanghai Metro, describing measures including non-destructive leakage detection of diaphragm walls, optimization of structural backfilling procedures, and installation of embedded penetration fittings in the inner lining wall for drainage. These measures significantly reduce seepage risks, ensure project quality, and provide valuable reference for leakage control in similar underground structures.

Keywords: seepage and leakage; diaphragm wall; embedded penetration fitting; quality control

Note: Figure translations are in progress. See original paper for figures.