Research on Construction Technology of Small-Angle Grinding Through Row Piles by EPB Shield Machine in Soft Soil (Post-print)

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Abstract

With the development of rail transit technology, shield tunneling machines grinding piles and passing underneath existing structures have become increasingly commonplace. Improper parameter selection can not only result in equipment damage to the shield machine, but more critically, may induce secondary disasters such as ground collapse and damage to existing structures. To enrich domestic construction experience in the field of shield machine pile grinding, this study systematically organizes and summarizes the construction technology of shield machines passing through row piles in small-angle mode with soft soil cutters, based on actual construction cases. It provides detailed descriptions of key information including problems encountered during construction, treatment measures, and tunneling parameters, aiming to provide robust technical support for the industry to accumulate pile grinding experience and to serve as a practical case reference for similar projects.

Full Text

Preamble

Research on the Construction Technology of Small-Angle Row Pile Grinding with Soft Soil Cutters in EPB Shield Machines

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Abstract

With the continuous development of rail transit technology, shield machines grinding through piles beneath existing structures have become increasingly commonplace. However, improper selection of operational parameters not only

risks damaging the shield machine itself but may also trigger secondary disasters including ground collapse and damage to existing structures. To enrich domestic construction experience in the field of shield machine pile grinding, this study systematically reviews and summarizes the construction technology for EPB shield machines penetrating row piles in small-angle mode using soft soil cutters, drawing upon actual construction cases. It elaborates on critical information such as problems encountered during construction, remedial measures, and key tunneling parameters, aiming to provide robust technical support for accumulating pile grinding expertise within the industry and to serve as a practical case reference for similar engineering projects.

Keywords: pile grinding; angle; soft soil cutter; row piles

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