# Key Technical Measures for Ultra-Large Diameter Slurry Shield Tunneling Through Stations: Postprint

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## Abstract

With the development of urban transportation in major Chinese cities, the proportion of large-scale highway tunnel construction within urban underground rail transit infrastructure systems has gradually increased. Large-diameter shield-driven highway tunnels feature multiple critical challenges, extended construction periods, high costs, and substantial risks. Conventionally, when large-diameter shield machines require reception and re-launching within a working shaft, the shield machine is dismantled and the frame is disassembled for station passage, which is both time-consuming and labor-intensive. This paper, taking the successful passage of a shield machine through the Yangshupu Port working shaft in Section V of the Shanghai North Passage New Construction Project highway tunnel as a case study, introduces a novel approach that integrates permanent and temporary structures with the secondary structure construction of the working shaft, enabling the shield machine and its frame to be integrally pushed through the working shaft as a complete unit. The related technologies involved in shield passage through the station and construction period aspects are presented, aiming to provide valuable reference for similar projects.

## Full Text

## Preamble

**Title**: Key Technical Measures for Super Large-Diameter Slurry Shield Tunneling through Stations

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## Abstract

With the development of urban transportation systems across major Chinese cities, large-diameter highway tunnels constitute an increasing proportion of urban underground rail transit infrastructure. Large-diameter shield tunneling for highway tunnels entails numerous technical challenges, long construction cycles, high costs, and significant risks. Conventionally, when a large-diameter shield is received in a working shaft and must be re-launched, the standard practice involves dismantling the shield and disassembling the gantry to pass through the station—a process that is both time-consuming and labor-intensive. This paper presents a case study of the successful passage of a highway tunnel shield through the Yangshupu Port working shaft in Section VIII of Shanghai's North Cross Passage New Construction Project. By integrating secondary structural construction of the working shaft and adopting a novel permanent-temporary combination approach, the shield machine and gantry were pushed through the working shaft as an integral unit. The paper details the relevant construction processes and schedules, offering valuable insights for similar projects.

**Keywords**: integral push-through, permanent-temporary combination, construction measures

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