

Function of temporary bridges in tunnel boring machines

Article Overview

Temporary bridges in TBMs serve as structural supports that stabilize the tunnel face and facilitate safe assembly, alignment, and material handling during excavation.

Role and Purpose

Temporary bridges, often referred to as shoring systems or temporary supports, are critical in TBM operations for several reasons:

- o **Stabilization of Excavation:** As the TBM advances, the surrounding soil or rock may be unstable. Temporary bridges provide immediate support to the tunnel walls and roof, preventing collapses and ensuring the safety of workers and equipment inside the tunnel (Ferrovial) .
- o **Support for Shield and Cutterhead:** In soft or mixed ground conditions, TBMs use shields that temporarily hold the ground. Temporary bridges help distribute loads from the shield and maintain the correct alignment of the cutterhead, ensuring precise excavation (Ferrovial) .
- o **Facilitation of Assembly and Maintenance:** TBMs are transported in modular components and often partially assembled within the launch shaft. Temporary bridges provide platforms for workers to access different sections of the machine safely during assembly, installation, and maintenance (Enerpac) .
- o **Material Handling and Transport:** Excavated material (muck) is transported via conveyor systems. Temporary bridges can support these conveyors and other equipment, allowing smooth removal of debris and continuous TBM operation (Encardio) .
- o **Safety and Operational Efficiency:** By providing a stable working platform, temporary bridges reduce the risk of accidents and allow precise positioning of TBM components, which is essential for maintaining the tunnel's planned trajectory and structural integrity (Ferrovial) .

Integration with TBM Components

Temporary bridges work in conjunction with other TBM systems:

- o **Shields:** The outer metal chassis of shields temporarily holds the ground while the permanent lining is installed. Temporary bridges complement this by providing additional support and access (Ferrovial) .
- o **Hydraulic Jacks and Perimeter Supports:** TBMs use jacks to push against the tunnel walls. Temporary bridges help distribute these forces evenly, preventing localized stress and deformation (Ferrovial) .
- o **Double-Shield TBMs:** In machines that operate in both soil and rock, temporary bridges allow safe transition between excavation modes and support the assembly of the secondary shield (Ferrovial) .

Summary

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Temporary bridges in TBMs are essential for structural support, worker safety, and operational efficiency. They stabilize the tunnel face, support the shield and cutterhead, facilitate assembly and maintenance, and ensure smooth material handling. Without these temporary structures, TBM operations in soft, mixed, or unstable ground would be significantly more hazardous and less precise.

The document provides detailed technical specifications for TBM components and processes to help ensure the machines can safely

This document specifies requirements for tunnel boring machines (TBMs) to be used for a tunneling project. It defines various TBM

A tunnel boring machine is a self-contained environment for the workers. It has facilities like offices, a kitchen and

A tunnel-boring machine (TBM) is a machine that can dig full-face tunnels underground; this means it is done in a single mechanical

For more than 65 years, Line 5 has safely and reliably operated in Michigan. Enbridge has entered into an agreement

These machines are equipped with a closed chamber that balances earth pressure to prevent settlement and are particularly

Article Snapshot A TBM boring machine is a large-diameter rotating excavation system that cuts through rock or soil to form tunnels

Tunnel Boring Machines A Tunnel Boring Machine (TBM) is a machine used to excavate tunnels with a circular cross section through

Tunnelling machine: Designed to excavate hard or semi-hard rocks without the need for a support system. Its pushing force is

From small bores to very large bores, long distance and deep underground excavations, or even tunnels with a highly specific cross

Tunnel Boring Machines are mechanical excavators that bore circular tunnels by cutting through the earth with a

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Modern tunnelling machines (TBMs) look very different to Marc Brunel's miner's cage but their function is similar. The TBMs dig out

Abstract: Tunnel construction is a complex engineering task due to difficulties and logistics involved in boring and digging over the

Advances in tunnel boring machines (TBM) have leveraged applied artificial intelligence to promote sustainable and

Tunnel Boring Machines (TBMs) are transforming underground construction. Learn how these machines are revolutionising tunnel

As the tunnel is excavated, temporary supports--such as steel sets, timber, or specialized shields--are installed to

Web: <https://www.kremgroup.co.za>

