

# ***Metrosur***

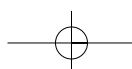
Second Edition

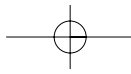
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## **Commuting in the 21st Century**

**a tunnelbuilder reference edition**





PROJECT METRO SUR MADRID

# High Pressure for the Metro Sur.

Madrid is extending its underground railway system. A Herrenknecht EPB machine (Ø 9.33m) was advancing a 6.45km long tunnel in soil with a high plaster content, as well as clay and siltstone. In order to master the compact geological conditions optimally, the EPB-Shield has been equipped with special performance features. 12 high pressure nozzles on the cutting wheel inject water at 300bar into the tunnel face. Torque of 20,236kNm provides the power to effectively excavate the soil. Best weekly performances of up to 187.5m are evidence of the efficiency of this design. In this project Herrenknecht had a total of three machines in deployment.

## Herrenknecht. Drilling for progress.



View of the screw conveyor



Cutterhead with installed performance of 2,800kW

**Contractor:**  
Ferrovial-Agroman S.A.

**Machine data:**  
EPB-Shield, Ø 9,33m  
Cutterhead power 2,800kW  
Tunnel length: 6,840m

**Geological conditions:**  
crystallised plaster with clay and siltstone

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