



Press Release

HERRENKNECHT

Tunnel boring machine delivered for Elbe River crossing of SuedLink

July 25, 2024

Schwanau, Germany

The grid expansion project SuedLink of the two transmission system operators TenneT and TransnetBW will transport electricity over 700 kilometers from Brunsbüttel in Schleswig-Holstein, northern Germany, to Großgartach in Baden-Württemberg, southern Germany, once completed. This will also involve crossing under the Elbe River with a tunnel around 5.2 kilometers long. The machine technology for the ElbX section comes from Herrenknecht and was handed over to the construction company and network operator on July 19, 2024.

_____ SuedLink is one of several extra-high-voltage direct current (HVDC) transmission lines planned in Germany. The “electricity highway” is intended to connect the wind power regions of northern Germany with the industrial locations of Bavaria and Baden-Württemberg in southern Germany. For this to succeed, the first step is to cross under the Elbe River. This section is considered a key project for the underground cable line. A consortium, ARGE Tunnel ElbX, is building an approximately 5.2 kilometers long tunnel from Wewelsfleth (Schleswig-Holstein) to Wischhafen (Lower Saxony) on behalf of the transmission system operator TenneT. The tunnel will accommodate six 525 kV underground cables and the associated building, safety, control and monitoring technology as well as rails for the tunnel vehicles required for maintenance and repairs.

Herrenknecht AG has received an order from ARGE Tunnel ElbX, consisting of PORR GmbH & Co. KGaA and Wayss & Freytag Ingenieurbau AG, for a tunnel boring machine (TBM) specially designed to meet the project requirements. On its way under the Elbe River, it will encounter varied geology consisting of clay, peat, sand, gravel as well as stones and boulders. The TBM of the Mixshield type has a diameter of 4,900 millimeters, is 190 meters long and weighs a total of 700 tons. Johannes Faißt, Project Manager at Herrenknecht, explains: “The ElbX tunnel with its heterogeneous subsoil, high

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water permeability and the water pressure under the Elbe is a special challenge that spurs us and our technologies on.”

The highly complex Mixshield, a Herrenknecht development, is sealed against the water pressure 20 meters below the Elbe with a multiple sealing system. The TBM is not only digging the tunnel but is also lining it at the same time with prefabricated concrete segments. The tunnel will have an inner diameter of 4 meters and an outer diameter of 4.60 meters. Already at the end of 1990s, Herrenknecht set new technological standards in tunnel construction in Hamburg with the Mixshield for the fourth tube of the Elbe River highway tunnel. Other worldwide reference projects such as the Tuen Mun - Chek Lap Kok Link in Hong Kong or the road tunnel between the Asian and European parts of Istanbul under the Bosphorus were built with this type of machine.

After factory acceptance, the machine will be dismantled, transported to Schleswig-Holstein, lifted into the shaft excavation pit in individual parts and assembled. The TBM is due to start work towards the end of the year.

Eric Fourchault, Head of Project Management at Herrenknecht, emphasized the role of mechanized tunnelling technology for the construction of energy infrastructure during the TBM acceptance: “ElbX is an outstanding example of how Herrenknecht technology supports the expansion of the power grid to implement the energy transition. Cable tunnels for high-voltage grids are also being built with our machines in major cities such as Berlin and London.” The numerous grid expansion projects in Germany alone involve around 4,500 crossings. Here, the new lines such as SuedLink encounter existing infrastructure and geographical obstacles that have to be overcome with underground cables. In addition to tunnel solutions, Herrenknecht offers various drilling and laying technologies for protective conduit and line construction as well as for gas and hydrogen pipelines.

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PROJECT DATA SuedLink ElbX

- › Client: TenneT TSO GmbH
 - › Contractors: ARGE Tunnel ElbX PORR GmbH & Co. KGaA und Wayss & Freytag Ingenieurbau AG
 - › Application: Tunnel for high-voltage underground cables
 - › Drive length: 5,224 m
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MACHINE DATA

- › Machine type: Mixshield
 - › Diameter: 4,900 mm
 - › Cutterhead drive power: 720 kW
 - › Torque: 2,369 kNm
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Photos

**Picture 1**

Factory acceptance of the tunnel boring machine with representatives of ARGE Tunnel ElbX (PORR GmbH & Co. KGaA and Wayss & Freytag Ingenieurbau AG), the grid operator TenneT TSO GmbH and Herrenknecht AG.

**Picture 2**

Mixshield for the Elbe crossing of SuedLink, client ARGE Tunnel ElbX (PORR GmbH & Co. KGaA and Wayss & Freytag Ingenieurbau AG).

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For further information: Please contact us.

Herrenknecht AG

Herrenknecht AG is the only company worldwide to deliver tunnel boring machines for all geologies and in all diameters – ranging from 0.10 to 19 meters. The product range comprises tailor-made machines for traffic, supply and disposal tunnels, technologies for pipeline installation as well as additional equipment and service packages. Herrenknecht also manufactures drilling equipment for vertical and inclined shafts as well as deep drilling rigs.

In 2023 the Herrenknecht Group achieved total output of 1,296 million euros. The independent family business employs about 5,000 people worldwide, including approximately 200 apprentices and trainees. With more than 60 domestic and overseas subsidiaries and associated companies working in related fields, Herrenknecht provides comprehensive, fast and targeted services close to each project and contractor.

› <http://www.herrenknecht.com/en/references>

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