

TERRATEC SECURES ALL MACHINES FOR SURAT METRO RAIL PROJECT

TERRATEC is pleased to announce the delivery of another EPB TBM for Surat. This unit is a new 6.61m diameter Earth Pressure Balance Tunnel Boring Machine (EPBM) that will be used on Phase I of Surat Metro Rail Project in India following successful factory acceptance earlier this month. This indicates all the machines for Phase 1 of Surat Metro Rail project will be from TERRATEC.

TERRATEC has secured all machine orders for this project: A combination of both brand new and refurbished EPBMs will be used. For Package UG-01,

Gulermak will use a brand new EPBM and a refurbished TBM and for Package UG-02, JKumar will use two refurbished TBMs. TERRATEC provides all spare parts, onsite technical assistance and a key field service engineer for the whole refabrication. TERRATEC is proud to be the sole provider of all the TBMs for the project.

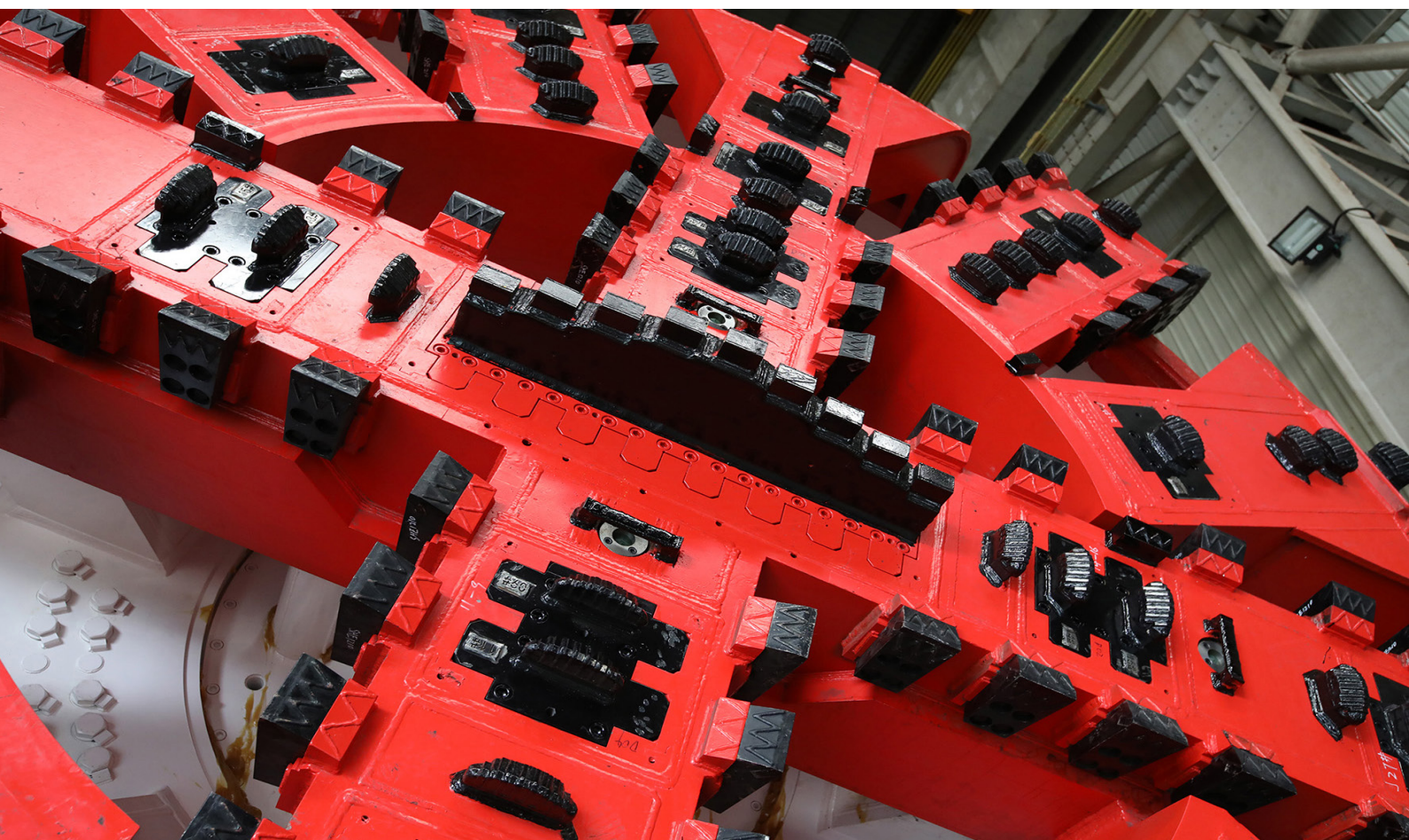
The Surat Metro is an under-construction rapid transit rail system for Surat in Gujarat state of India. Two corridors with a combined length of 40.35 kilometers are under construction since January 2021. The project is expected to be completed by

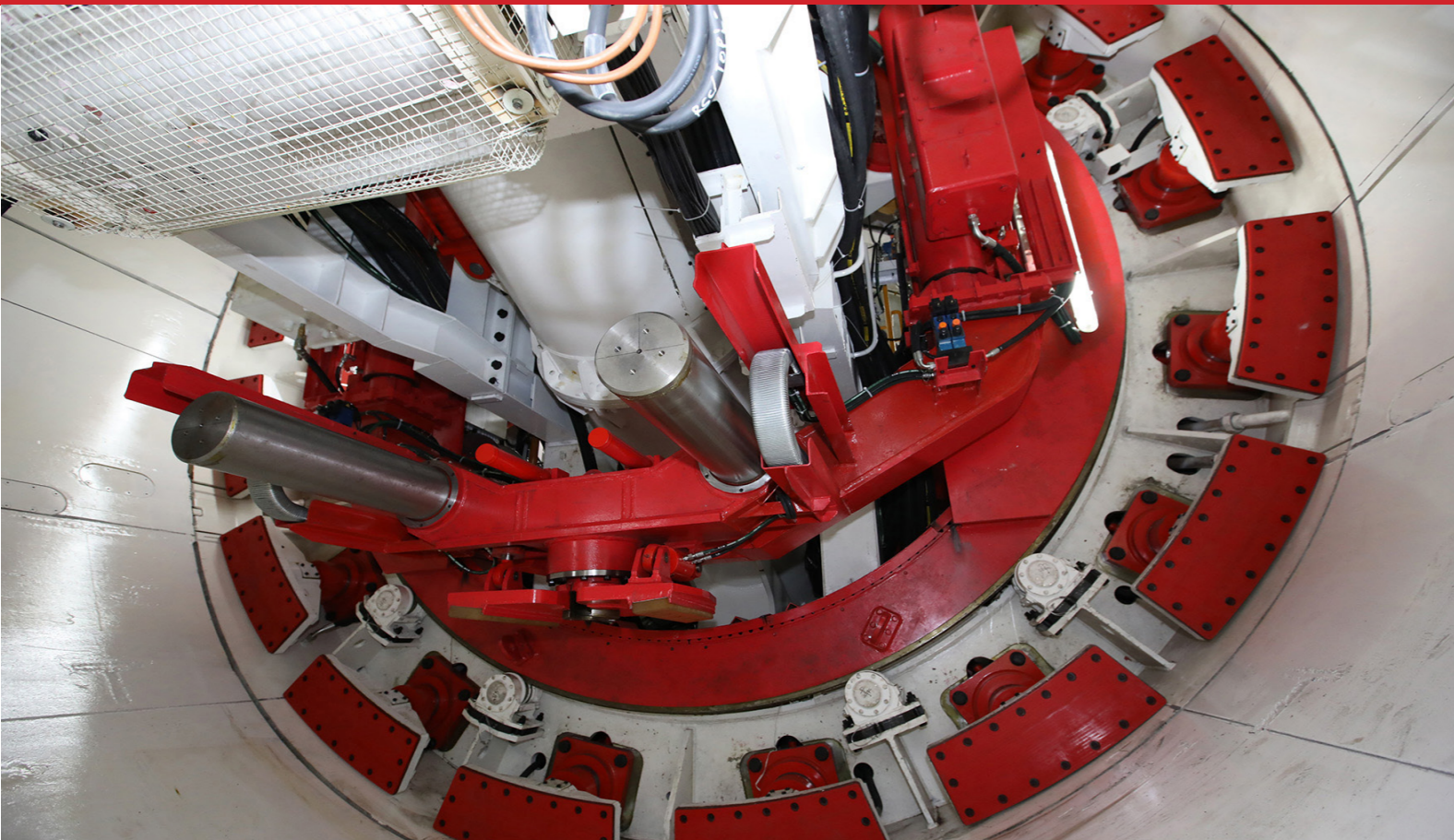
December 2023. The new TBM will now be transported to India. Then reassembled on-site with the help of TERRATEC field service team.

The geological conditions along the tunnel alignments will be sand, clay, gravel and silt. A twin bored underground tunnel will be built between the Northern ramp and Surat Railway Metro station, using all cut and cover method across 6 underground stations.

For Package UG-01, it covers Kapodra, Labheshwar Chowk and Central Warehouse stations. For Package UG-02, it covers Chowk Bazar, Maskati Hospital and Surat

TERRATEC delivers another EPB TBM that will be used by Gulermak-Sam India JV for the underground works on Phase I of Surat Metro Rail Project in India thus securing all the machines for Phase 1 of Surat Metro Rail project.





TERRATEC EPBM READY FOR SOUTH BANGKOK CABLE TUNNEL PROJECT

TERRATEC is pleased to announce the delivery of a 4.27m EPB TBM for the South Bangkok Cable Tunnel Project by the Metropolitan Electricity Authority (MEA) in Thailand. Following the successful Factory Acceptance Test (FAT), the machine is now ready to be shipped to the site where contractor Nawarat Patanakarn PCL will build a cable tunnel to supply the electricity from South Bangkok electrical substation to Samuth Prakan Province.

features a classic soil configuration with a spoke-style cutterhead and a 70% opening ratio. TERRATEC designed a robust high flow cutter head specifically for the expected ground conditions.

Designed to accommodate a new high-voltage cable system, the South Bangkok Cable Tunnel Project is one of a series of planned tunneling projects by the MEA that are being built to meet increased power demands and ensure reliable supply in the Thai capital. The project

includes the construction of underground power transmission tunnels under the Chao Phraya River from the Southern Bangkok electrical substation to Suksawat Road. TERRATEC EPB TBM will be deployed by contractor Nawarat Patanakarn PCL to cross Chao Phraya River which is 500m wide and approximately 30m deep. The cable tunnel will be 950m long. This new electricity tunnel will increase the capacity of the existing horizontal directional drilling (HDD) electrical cable nearby.

The 4.27m EPB TBM machine

TERRATEC delivers the new 4.27m dia. EPB TBM that will be used by Contractor Nawarat Patanakarn PCL to supply the electricity in Bangkok, Thailand.

Railway stations.

This latest new TBM will be used by Gulermak-Sam India JV for Gujarat Metro Rail Corporation Limited to complete the tunnelling works for Phase-I of Surat Metro Rail Project. Package UG-01 and Package UG-02 consist of a 7km underground tunnel and six underground stations.

The versatile TERRATEC EPBM units have robust mixed-face dome-style cutterheads designed to work effectively in the soil composed of sand, clay, gravel and silt. As the TBMs progress, they will install 1,500mm wide by 275mm thick pre-cast concrete lining rings, which consist of five segments plus a key.

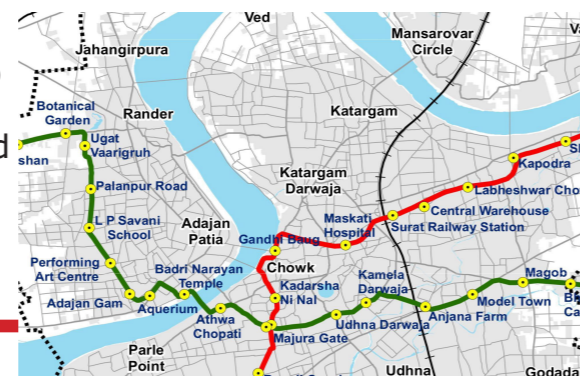
For added versatility, TERRATEC has designed the CutterHead to allow the cutting tools to be

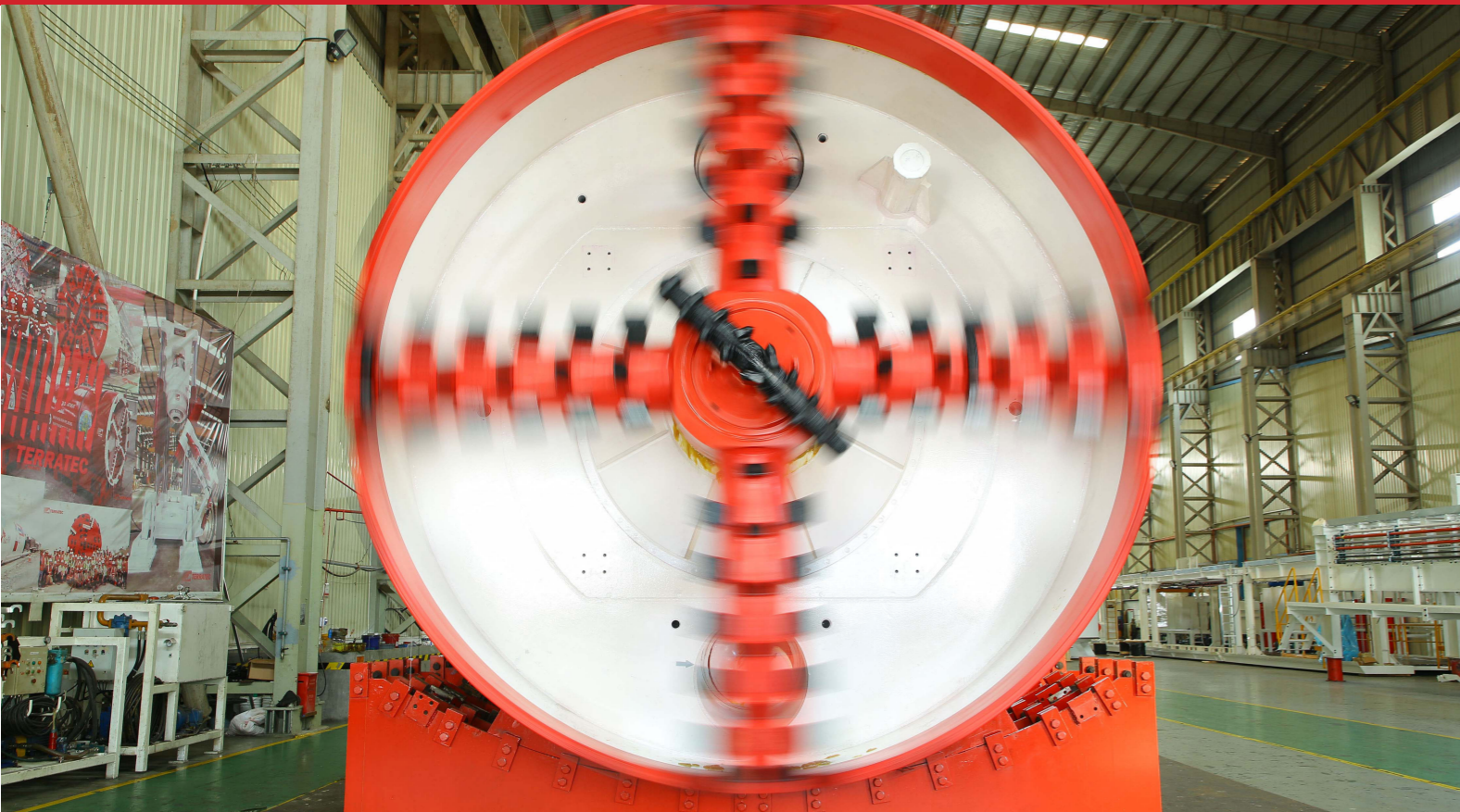
exchangeable for 17" disc cutters, allowing the TBM to be able to bore through the D-walls and cope with the presence of any unexpected obstacle on its way, such as old wells or foundations.

As the TBMs progress, they will install 275mm thick x 1500mm long, reinforced concrete Universal-style, pre-cast lining rings – comprising six segments + key. Muck removal, segment transport and logistics supply will be via locomotive and muck cars. Surat is a city in the Western Indian state of Gujarat and is one of the world's fastest growing cities. In Phase 1, 20 metro stations will be built on the first corridor from Sarthana to DREAM City route and 18 metro stations will be built on the second corridor from Bhesan to Saroli.

After successful completion of Delhi Metro Phase III, Terratec

has been chosen again for the underground tunnel package in Surat Metro Rail Project which proves that Terratec is the first choice for the contractors. TERRATEC's continuing success on projects such as Phase III of the Delhi Metro, Lucknow Metro, Pune Metro, Kanpur Metro, Ahmadabad Metro and Mumbai Metro is a result of tailor-made robust TBM design, prompt onsite assistance, readily available stock of TBM spares and highly-skilled specialised TBM support throughout tunnelling operations.





Major challenges on the project will include crossing the 500m river as well as excavating alongside with the existing live HDD cable supply which is the most challenging part of this project. Therefore, the TBM will be operated in an alert mode throughout the whole excavation of the cable tunnel to ensure that the excavating process will go smoothly.

Geological conditions along the tunnel alignments will consist of mixed faces of silt, clay and fine sand with an average overburden of 35 m (114 ft) and a groundwater head of about 3 bars. The TBM's soft ground cutterhead therefore features a spoke design and the addition of knife bits to assist break-in and break-out of the concrete shaft eyes.

Traditionally reinforced, 300mm thick by 1200m wide and universal tapered precast concrete segments (4 + key) will be installed as the machine progresses and muck removal, segment transport and machine supply will be via rail bound equipment.

As the water pressure is high, the TBM has been designed to remove the muck by using the TERRATEC trademark "Non tuck hose" plus belt conveyor. It has been proven that this system is the most suitable for Bangkok sand stratum.

Machine operation will be assisted at all times by TERRATEC's highly-experienced Field Service staff, providing quality after-sales support to ensure optimum performance and successful

project completion. Located at the south of Bangkok sub-urban, the machine will be launched from a 12m (39ft) diameter shaft which is currently being constructed near the Chao Phraya River.

The shield of the TBM and backup systems are also tailored to accommodate the tight curve project requirements. This includes a mucking system that conveys spoil from the TBM's screw to the "Non-tuck hose". With the machine designed of 40-meter turning radius, it will comfortably swerve around any obstruction.

TERRATEC has a well-established regional base in Thailand, having sold its first machine in the country ten years ago for the Metropolitan

Rapid Transit (MRT) Blue Line Extension Project. With outstanding tailor-made robust TBM design, prompt onsite assistance, readily available stock of TBM spares and specialised TBM support throughout the tunnelling operation, TERRATEC has become the country's leading TBM supplier.

WATCH US ON YouTube

A video featuring TERRATEC's TBM S86 Breakthrough (Delhi Metro Phase 4 DC-06)



To subscribe to this newsletter, please contact: info@terratec.co



WWW.TERRATEC.CO