TERRATEC DELIVERS ITS **25TH TBM TO INDIA**

The new 3.14m diameter TERRATEC EPB TBM will empower sewage infrastructure components on the Mumbai Sewer Disposal Project Stage II Priority Works, in Mumbai, India.

TERRATEC is celebrating the delivery of its 25th machine to India in the last eight years. The Company is adding one more to the long list of previously deployed machines to construct key Metro, Sewer and Hydroelectric Projects in the Country, which have successfully completed so far over 58 kilometers of tunnelling.

This time, TERRATEC is deploying a new 3.14m diameter Earth Pressure Balance Machine (EPBM) for the Mumbai Sewer Disposal Project (MSDP) Stage-II Priority Works Project, in Mumbai, India. The machine will be used by contractor Michigan Engineers Pvt. Ltd. for Municipal Corporation of Greater Mumbai (MCGM).

Designed to provide a healthier and improved environment for the citizens of Mumbai, MSDP Project is one of a series of sewage projects being undertaken by the MCGM, which are being built to meet and improve the quality and reliability of the wastewater collection, treatment and disposal infrastructure for the ever-growing population. design with a 49% opening ratio and cutting tools consisting of fixed and back-loading knife bits that will ensure rapid advancement and minimum interventions.

The TERRATEC EPBM is designed to cope with varied geological conditions along the tunnel alignments consisting of mixed ground, basalt and breccia. The TBM has 25 rings of 17” rear replaceable disc cutters and a high torque main drive that is still capable

of rotating up to 5 rpm. The TBM is equipped with a fully active articulation system to accommodate a minimum curve radius of 250m. Due to size constraints and the installation of a full hyperbaric man lock the TBM's main drive is hydraulic.

The 4+1 universal type segment design, (200mm thick by 1000mm long) reinforced concrete segments will be installed as the machine progresses by the mechanically actuated erector. Muck removal, segment transport and machine supply will be by TERRATEC rolling stock and battery locomotives. 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.

"At Michigan Engineers, we chase dreams. Our thoughts become things to enable our progress as a tunnelling company. It's a proud moment to take delivery of our first 3m plus machine to add to our fleet of over ten microtunelling machines." said Saurin Patel, Managing Director of Michigan Engineers Pvt. Ltd.

The works of MSDP Stage-II are divided in five phases and those in the first two phases are called 'Priority Works'. The MSDP Stage II - Priority Works are comprised of infrastructure components including expansion of sewage collection networks, new pumping stations, waste water treatment facilities and treated effluent disposal.

Following the successful factory acceptance test, the machine will be now shipped to Mumbai and the TBM will then be transported to the project site where it will be launched on its first 1,857m-long drive.

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TERRATEC OPEN TBM DELIVERED FOR MUMBAI'S WATER TUNNEL PROJECT

The new 3.2m dia. Open TBM will complete two drives for Amar Mahal II water transfer tunnel contract in Mumbai, India.

TERRATEC's Open TBM for the Municipal Corporation of Greater Mumbai's (MCGM) Amar Mahal II Tunnel Project in Maharashtra, has passed the Factory Acceptance Test (FAT), making it ready to be shipped to the site where contractor Patel Engineering Limited will complete a water transfer tunnel.

This machine is a 3.2m Diameter Open TBM designed to work effectively in the geology expected along the project alignment. The project requires the TBM to have a modular design that allows it to be launched and potentially received via shafts (or alternately disassembled inside the tunnel). The tough CutterHead is equipped with 18 heavy-duty back-loading disc cutters. The VFD controlled electric motors enabling the cutter head to rotate at over 10rpm with optimum torque.

To allow safe tunnelling through all the sections of the alignment, the machine has been designed with very efficient ground supporting equipment which includes a fixed probe drilling unit, two rock bolting drills and an steel arches erector.

The 3.2m diameter TERRATEC Open TBM will be deployed by contractor Patel Engineering Limited, on the AMT-II tunnel which is one of a number of projects presently being carried out by MCGM to augment and improve its water distribution system in order to meet increased demand and ensure reliable supply.

The project will consist of two TBM drives totalling 5,350m in length between three shafts of depth up to 105m. The finished 2.5m diameter tunnel contract from Amar Mahal (Hedgewar Udyan) to Trombay Low-Level Reservoir (TLLR) and further up to Trombay High-Level Reservoir (THLR) at an average depth of 80 to 90m is for water transfer.

TBM 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.

In recent years, TERRATEC has emerged as the leading TBM supplier in the Indian market. TERRATEC's enduring successes on projects such as Phase III of the Delhi Metro, Lucknow Metro, Ahmadabad Metro, Mumbai Metro and Pune Metro have been the outcome of outstanding tailor-made robust TBM design, prompt onsite assistance, a readily available stock of TBM spares and specialised TBM support throughout the tunnelling operation.

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