

# TERRATEC DELIVERS FOUR MORE EPBMS TO ISTANBUL



*Gulermak, Nurol & Makyol JV gear up for tunnelling on the Ümraniye-Ataşehir-Göztepe Metro Line, in the latest addition to Istanbul's ongoing mass transportation expansion.*

**T**ERRATEC is pleased to announce the on-time delivery of a further four new 6.56m diameter Earth Pressure Balance Tunnel Boring Machines (EPBMs) for the ongoing expansion of Istanbul's Metro system, in Turkey, following a number of recent factory acceptance tests.

These EPBMs bring the current

number of TERRATEC machines working simultaneously in the city up to a total of seven.

The robust TERRATEC TBMs have versatile mixed-face dome-style cutterheads with an opening ratio of about 35% that have proven to work extremely effectively in Istanbul's mixed geology – which includes low-strength

sandstones, siltstones, limestones and shales – as well as other state-of-the-art features such as VFD electric cutterhead drives, tungsten carbide soft ground cutting tools that are interchangeable with 17" roller disc cutters, high torque screw conveyors and active articulation systems.

The new TBMs will be used by





the Gulermak, Nurol & Makyol JV on the Ümraniye-Ataşehir-Göztepe Metro contract, which was awarded in April 2017.

The 13km-long line, along with 11 new stations and NATM-built connections, will form a second north to south rail corridor under the densely-populated Anatolian side of the city and will be located entirely underground at an average depth of about 30m. Once open to the public, it is expected that the new line will carry around 35,000 riders in each direction hourly.

The Ümraniye-Ataşehir-Göztepe project is one of five

new metro lines currently being built by the Istanbul Metropolitan Municipality.

Members of the JV were so impressed with the performance of the TERRATEC machine used on the Mecidiyeköy-Mahmutbey Metro, which is being built by the Gulermak, Kolin & Kalyon Joint Venture – and the progress of two other 6.56m diameter EPBMs that were delivered last year to the Şenbay Madencilik-Kolin-Kalyon Joint Venture for the Dudullu-Bostancı Metro Line – that they were keen to employ a further four TERRATEC machines on this latest project.

"Terratec is excited to be providing yet more machines to the metro projects in Istanbul," says TERRATEC Sales & Marketing Director, Bruce Matheson. "We are confident they will perform as well as previous machines have in the city and we look forward to breaking more records for on-time delivery, quick assembly and excellent production rates."

Istanbul is among the fastest growing cities in the world, with a population exceeding 14 million. Due for completion in 2019, the new lines will increase the city's current 145km Metro network to more than 480km.

## TERRATEC OPENS PERU OFFICE TO SERVICE RAISE BORING MARKET

**A**t the end of last year, Australian-based manufacturer TERRATEC, marked the opening of a new office in Lima, Peru, to support its continued growth in the Central and South American Raise Boring Machine (RBM) market.

The new office will focus on sales of new machines, as well as the ongoing servicing and maintenance of a number of existing units working throughout the region.

"An upswing, in what has traditionally been a relatively slow market environment, has resulted in a healthy order book of Raise Bore Units for TERRATEC in the Latin American region," says Sales & Marketing Director, Bruce Matheson.

"We have opened this office to extend our service capabilities to clients and to equal the cradle-to-grave service and continued customer assistance that we are known for in

other parts of the world. TERRATEC units are operated by mines and contractors who enjoy their industry-leading reputation for low maintenance regimes and long-life spans – some of these units have been operating for over 25-years and to the contractors who run them they are part of the family. Our aim is to keep them running as smoothly as when they were first made."

The new office – which is strategically located in easy

*In response to continued growth in the Central and South American Raise Boring Machines demand, TERRATEC has opened a dedicated new office in Lima, Peru.*







Above: Eng. José France, technical advisor (mining), marks the official inauguration of the new TERRATEC office in Peru.

distance from both downtown Lima and Jorge Chávez International Airport – will be overseen by TERRATEC's Director of Operations (Raise Boring) in the Region, John Alejos, who has more than 25-years of experience in the raise bore market and has worked for numerous contractors and mining operations around the globe before joining the TERRATEC team some years ago.

"I am very pleased to be heading up this Latin American expansion," says Alejos. "I have known TERRATEC Raise Bore Machines for many years and have worked directly with the company for several years now. The TERRATEC units are

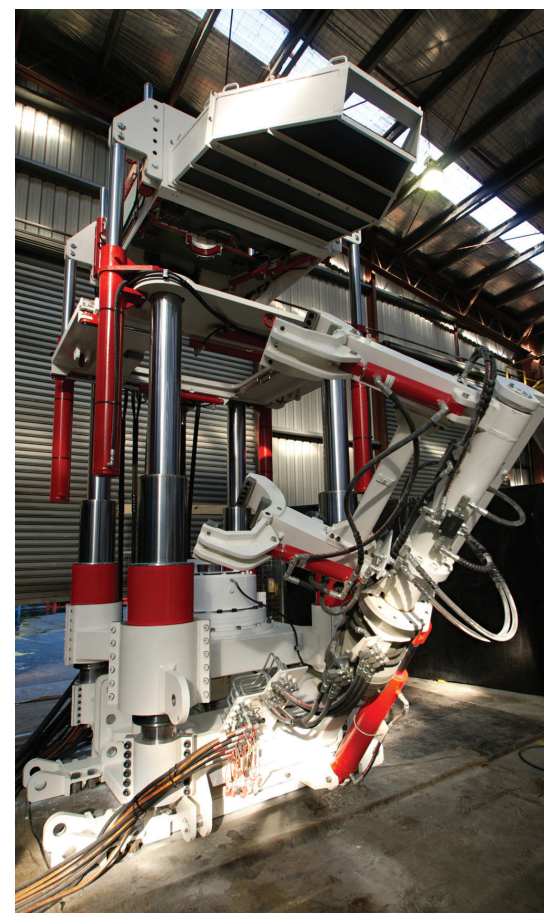
in great demand due to the simplicity of their design, which ensures robust performance underground and very high mechanical availability rates. The reliability of the rigs is something I enjoyed when I was a contractor and an operator and now I get to share my knowledge and passion about these units with others in the industry."

TERRATEC has numerous Raise Boring Machines currently working along the American Continent, in Canada, USA, Mexico, Colombia, Peru and Argentina. These include the company's range of Raise Boring Machines, Down-Reaming Drills and Box-Holing Rigs, as well as a combination

of these in the form of the Universal Boring Machine, all of which have been recognised for their innovative high-performance design.

TERRATEC's experienced Engineering and Field Service Team can assist buyers from the planning stage, including custom design specifications, assembly and operation of Raise Boring Machines on site, and lifetime servicing and maintenance support.

*The new TERRATEC Peru office is located at:  
Plexus Business Center  
Calle Martin de Murua #150,  
Floor 12, Office 1205 Urb,  
Maranga, San Miguel, Lima.*



## TERRATEC MARKS RECORD-BREAKING TBM ADVANCE IN ISTANBUL

**A**t 7am, on March 03, 2018, one of two TERRATEC 6.56m diameter Earth Pressure Balance Tunnel Boring Machines (EPBMs) employed on the Dudullu-Bostancı Metro Line project, in Istanbul, Turkey, completed an outstanding advance of 19 rings in a single shift. Equating to 26.6m of excavation in just 12-hours, the TBM worked non-stop – alternating between 20-minute mining

and ring building cycles – to accomplish a new production record for a TBM of this size and class in Istanbul.

The TERRATEC TBMs are being used by the Şenbay Madencilik-Kolin-Kalyon Joint Venture (SKK JV) – along with two other machines – on the Dudullu-Bostancı Metro Line, which runs approximately north to south under the densely-populated Anatolian

side of the city. The 14.2km-long line, along with its 13 new stations, is located entirely underground at an average depth of about 30m.

The robust TERRATEC TBMs have versatile mixed-face dome-style cutterheads with an opening ratio of about 35% that have proven to work extremely effectively in Istanbul's mixed geology – which includes sandstones,

*In early March, Senbay Madencilik-Kolin-Kalyon JV achieved a record-breaking TBM production shift during excavation of the Dudullu-Bostancı Metro Line, in Istanbul.*





siltstones, limestones and shales – as well as other state-of-the-art features such as VFD electric cutterhead drives, tungsten carbide soft ground cutting tools that are interchangeable with 17" roller disc cutters, high torque screw conveyors and active articulation systems.

Assembly of the TERRATEC S50 and S51 machines took place at the project's central shaft site at Kayışdağı station, in February 2017. By early March, the S50 machine had been launched on its 3,980m journey south-west to İçerenköy station and shortly

thereafter the S51 machine began mining north-east on its 4,377m drive towards Türk-iş Blokları station. Once the TBMs' conveyor systems had been fully installed, the machines quickly got up to speed and have maintained consistent advance rates since then.

As the TBMs have progressed along their alignments, they have been installing a pre-cast tunnel lining consisting of reinforced concrete trapezoidal segments (5+1), with an outer diameter of 6,300mm, an inner diameter of 5,700mm and a width of 1,400mm.

These segments are being produced by SKK JV at its factory in Ferhafpasa, which is located about 10km from the project worksite.

The achievement of such successful TBM production rates in such a densely-populated area of the city, with minimal room on site for segment or muck storage, is testament to the project team and on-site logistics:

*"While planning the logistics and TBM supply, we had to consider the traffic in Istanbul,"* says Enver Koc, Chief Tunnel Mechanical Engineer for SKK

JV. *"Traffic jams are inevitable in a city of 14 million people. So, with the need for on-time segment delivery and muck removal from site, 70 percent of our operations are performed during the night shift."*

The record-breaking 19-ring shift was completed by the S51 machine, which has currently mined about 75 percent of its alignment and is due to reach its final destination this June. Slightly ahead of its sister machine, the S50 TBM is due to complete its final drive for the project by the end of March, 2018.

*"This is our first experience of working with TERRATEC,"* says Koc. *"We heard the company name only a few years ago and at that time the Turkish market was dominated by other TBM manufacturers, but now TERRATEC is mentioned all the time due to the good performance. Our TBM operators adapted to the machines very quickly and TERRATEC has been on hand to provide quick solutions whenever we need them. We would absolutely prefer to use TERRATEC machines again in the future."*

The Dudullu-Bostancı

Metro project is one of five new metro lines currently being built by the Istanbul Metropolitan Municipality (IMM). Five other TERRATEC machines are currently at work on these projects, including the Mecidiyeköy-Mahmutbey Metro Line – which is being built by the Gulermak, Kolin & Kalyon Joint Venture – and the Ümraniye-Ataşehir-Göztepe Metro Line, which is being built by the Gulermak, Nurol & Makyol JV.

Due for completion in 2019, the new lines will increase the city's current 145km Metro network to more than 480km.



## WHEREABOUTS

Meet TERRATEC at the following conferences and exhibitions!



ITA-AITES World Tunnel Congress 2018  
Apr 21-26 | Dubai, UAE



2018 North American Tunneling Conference  
Jun 24-27 | Washington D.C., USA

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