

FOR IMMEDIATE RELEASE

## September 10, 2015

**Headline: Robbins Crossover TBMs in New Territory**

*Sub-Headline: First Rock/EPB TBM in North America represents an Evolution in Design*

On August 10, 2015, North America’s first Robbins Crossover TBM was launched for the Túnel Emisor Poniente II (TEP II) Project in Mexico City, a complex wastewater scheme for joint venture contractor ALDESA/PROACON/RECSA. Assembled onsite using OFTA (Onsite First Time Assembly), the 8.7 m (28.5 ft) dual-mode type machine is an XRE TBM, and part of the new Robbins Crossover TBM series. The XRE TBM is capable of “crossing over” (X) between two modes, rock (R) and EPB (E), and its fine-tuned design represents a new generation of Crossover machines.

Variable ground conditions necessitated the contractor’s choice of a Robbins Crossover TBM. The 5.9 km (3.7 mi) tunnel consists of sections ranging from fairly competent to weathered volcanic rock, soft sands, and clays. While standard TBMs tend to lose efficiency in these kinds of variable conditions, the Crossover TBM is equipped with special design features to tackle the mixed ground. These field-tested features include a single-direction cutterhead for more efficient excavation in abrasive ground, and multi-speed gearboxes. The specialized gearboxes provide added torque at low RPM in fault zones and soft ground, as well as high RPM for rock boring.

The design of the TEP II machine was based largely on experience from past Robbins projects, in particular the Kargi Kizilirmak Hydroelectric Project in Central Turkey. At Kargi, Robbins supplied a 9.84 m (32.3 ft) diameter Double Shield TBM, based on initial geologic reporting of fractured hard rock. Within 80 m (260 ft) of launch, the geology became substantially more difficult than expected, consisting of blocky rock, sand, clays and water-bearing zones. The machine required multiple bypass tunnels and major modifications before it could resume excavation.

Modifications included a custom-built canopy drill and positioner for enhanced drilling and ground consolidation, gear reducers to adjust torque and RPM to changing ground conditions, and short stroke thrust jacks to double total thrust capabilities. After the modifications, advance rates increased dramatically in the difficult ground and soared to 723 m (2,370 ft) in one month as conditions improved. The modifications proved instrumental to the design of Crossover XRE (Rock/EPB) TBMs, including the TEP II machine.

The contractor at TEP II is confident about the machine’s abilities, which are optimized for hard rock but with many EPB characteristics: “In my opinion, the best part about the design of this TBM is the cutterhead; it is very robust,” said Sebastián Gallego Murillo, TEP II Production Manager for PROACON. He added that the biggest challenge would come near the end of the tunnel drive: “We expect to convert [from hard rock] to EPB mode due to the soils in this area. We will need to change out the cutters and modify the cutterhead.”

The benefits of the project are worth the potential challenges. “This tunnel will reduce flooding in the west and northwest areas of the Valley of Mexico, and increase wastewater capacity. It will benefit three municipalities that are home to 2.1 million people,” said Gallego. Twenty years in the making, the TEP II tunnel will eradicate chronic flooding in the sensitive municipalities of Tlanepantla, Atizapan de Zaragoza and Cuautitlan Izacalli, which have historically been affected with overflows as high as 2 m (6.6 ft) during the rainy season.

WORD COUNT: 534

**Side bar: The News in Brief**

* The 8.7 m (28.5 ft) TBM for Túnel Emisor Poniente II is the first Robbins Crossover TBM to be used in North America.
* The XRE TBM is a Crossover (X) between rock (R) and EPB (E), and includes features of both a hard rock Single Shield machine and an EPB.
* The Robbins XRE was successfully completed using Onsite First Time Assembly (OFTA) at a jobsite in Mexico City.
* The 5.9 km (3.7 mi) tunnel consists of incredibly complex ground conditions, from competent to weathered volcanic rock, clay, and sand.
* The XRE TBM is part of a new generation of Crossover machines, designed with field-inspired features including single-direction cutterheads, multi-speed gearboxes, and improved probe drilling capabilities.
* Túnel Emisor Poniente II will relieve overtaxed wastewater lines in three key municipalities home to 2.1 million people. The areas are prone to wastewater overflows of 2 m (6.6 ft) or more during the region’s rainy season.

Images Attached to Email. If you need a higher resolution image, contact Desiree Willis.

Captions for Images:

**Image 1:** North America’s first Robbins Crossover TBM, an 8.7 m (28.5 ft) machine, was launched at Túnel Emisor Poniente II on August 10, 2015 in Mexico City.

**Image 2:** The machine was assembled using Robbins’ Onsite First Time Assembly (OFTA) method instead of in a shop—a proven way to save both time and money.

**Image 3:** Officials from the project owner--the National Water Commission, or CONAGUA--celebrated the launch of the Robbins Crossover machine in a ceremony.

**Image 4:** The Robbins TBM features distinct designs that give it characteristics of both a hard rock and EPB TBM. Next generation concepts include a single-direction cutterhead and multi-speed gearboxes.

**Image 5:** Robbins Field Service worked proudly alongside the contractor to provide support and training during the complex machine’s assembly and launch.

**Video:** Link to drone footage of the Crossover TBM assembly and launch ceremony here: <https://www.youtube.com/watch?v=t_Pu8O-qU-4>. Email Desiree Willis to host the file on your website.

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