

THRUST BORING TECHNOLOGY

PBA 205 - ITALY



In the summer of 2016, the Ministry of Infrastructure and Transport for the region of Lazio awarded the contract for the infrastructure refurbishment of Piazzale Flaminio in Rome to PATO S.r.l. based in Occhiobello. The construction of a new connecting tunnel that incorporates a commuter station, train and metro services was planned.

The main section of the tunnel will be drilled through bedrock by conventional drill methods. For the first stretch of about 52 metres, a different technique was required, as the new track passes under a protected library building whose foundation extends deep into the envisaged tunnel cross section. Together with the machine manufacturer mts Perforator, the PATO engineers came up with an ingenious solution consisting of a pipe arch support with 36 drill holes of 813 mm in diameter.

For this special project, the partners decided to use the new PBA 205 thrust boring machine for casing lengths of 12 metres. As the 52-metre section had to be drilled with high accuracy and without a target pit, the engineers designed a retractable and steerable cutter head suitable for various ground conditions. The thrust holes were drilled at a distance of maximum 7 cm to each other, a real challenge for the steering head and the guidance system. The machine was equipped with a centre hole in the gear system for directional pilot drilling and another optical path, which allows use of high-precision laser guidance system developed for mts Perforator microtunneling jobs. The auger boring machine was controlled entirely from a jacking container – another novelty. Instead of a manually operated valve block, the thrust boring system is equipped with latest PLC system that enables all measuring and boring tasks from the control station in the mts container.

This innovative technology proved a success from day one, and the first two bores were completed within only six and seven working days respectively. As the drilling crew became more experienced, a few minor modifications were made to the equipment and process, resulting in a drilling rate of around 11 to 13 metres per day. Towards the end of the project, it took the team only four days to drill a hole, retract the inliner and the cutter head and perform the necessary welding work, which is an outstanding achievement. The bores were completed with maximum deviations of ± 25 mm in vertical and horizontal direction from the planned axis.

Success of this exceptional project was not least due to great site management, continuous maintenance of the equipment, the excellent skills of a highly motivated team and an innovative technical solution for drilling through partly quite difficult grounds.

SHORT FACTS

Main Contractor:	Ministero delle Infrastrutture e dei Trasporti– Region Lazio
Customer:	Fa. P.A.T.O S.r.L , Italy
Job Site:	Piazzale Flaminio , Rome
Project Length:	36 x 52m
Geology:	Cemented sand, travertine concretions, foundation elements of Biblioteca dell' Agricoltura
Machine:	PBA205
Max. Torque:	3.600daNm
Max. \varnothing:	813 mm



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