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INSTALLATION OF PRE-SUPPORT STEEL PIPES TO PROTECT AN HISTORICAL BUILDING BY A RETRACTABLE MTBM

ABSTRACT

INSTALLATION OF PRE-SUPPORT STEEL PIPES TO PROTECT AN HISTORICAL BUILDING BY A RETRACTABLE MTBM

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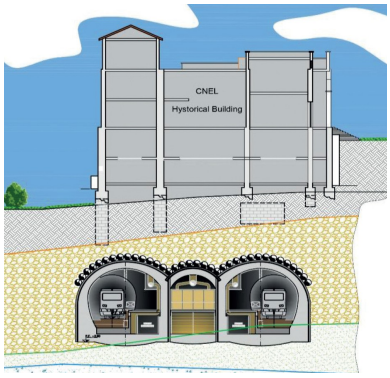
As part of the modernization of the "Piazzale Flaminio - Riano" section of the "Rome - Civita Castellana - Viterbo" railway line, the new Piazzale Flaminio railway station has to be built. The station atrium represents a particularly delicate underground work for the urban context in which it is located, above all for the interference with pre-existing historical buildings. In the initial stretch, the station galleries undergo the historic building of the former CNEL Library with very low coverage.
In order to minimize the effects induced by the construction of the station galleries, their excavation must be preceded by the laying of 36 steel pipes DN 800 mm, horizontal and side by side but detached and independent, with a pre-support function, having a length of about 50 m each, drawing the upper contour of the three tunnels (see photos), finally filled with concrete.
The installation of the steel pipes was performed by the company P.A.T.O. Srl through a **Micro Tunnel Boring Machine (MTBM) designed and created ad hoc - for the first time in the world - for this project**, where it **was necessary to guarantee at the same time**:
• **auger dry excavation**, not to "disturb" the ground and the foundations of the building, intersected in some points



• **retractable MTBM**, due to the impossibility of realizing a MTBM extraction chamber for archaeological and environmental reasons
• **MTBM guided and able to guarantee the design position of the drilling axis with a maximum deviation of 20 mm.**

The 36 drilling operations were completed in a total time of **45 weeks**, including the **resolution of unforeseen events**, one of which was caused by an **earthquake that permanently blocked the advance of one of the steel pipes during drilling**.