



## Italy

### Rome metro construction makes progress

Construction of Line B1 and Line C is proceeding well in Rome. The section of Line B1 from Bologna to Conca d'Oro (3.9 km) is fully funded and so is the next stretch from Conca d'Oro to Jonio (approx. 1 km), which construction site has been officially launched on **18 November**.

Line C is fully financed from Pantano/Monte Compatri to Clodio/Mazzini.

#### Line B1

On 4 December during Santa Barbara Day, patroness of miners and tunnellers, the mayor of Rome Gianni Alemanno visited **Line B1** of the city metro. The visit followed the **arrival at the Libia/Gondar station** of the first of two tunnel boring machines on 3 December. The machine completed the uneven track tunnel from Conca d'Oro to Libia/Gondar, achieving the first important milestone of the new line. The station lies 38 m deep.

The project has been subcontracted to **SELI** by a joint venture of Salini Costruttori and Maire Engineering in early 2008 for €50 million. It includes the construction of a 3 km long twin tunnel lined with 35 cm thick precast concrete segments in a 6+1 universal design arrangement.

Excavation is carried out using two EPB TBMs driving from the Conca d'Oro station box. The complete excavation system has been designed and manufactured by SELI in cooperation with Herrenknecht, who supplied the TBMs according to SELI basic design and specifications, and Continental, who supplied the tunnel conveyors and the station vertical conveyor.

The TBMs had to bore this first stretch of the line under very high EPB pressure (3-4 bars) and very critical conditions due to poor geology (sandy clay), the tunnel depth (30 m), groundwater pressure (2.5 bars), the presence of old critical buildings, and a drive under the Aniene River.



*Gianni Alemanno, mayor of Rome (left), visited the Libia/Gondar station on 4 December, Santa Barbara Day.*

While the uneven track TBM will be maintained at the Gondar station box, the even track TBM will break through at the same station early in January 2010.

The two TBMs will then complete the excavation of the line during the next year and they are expected to arrive at the Piazza Bologna station between July and October 2010. The Bologna-Conca d'Oro section will be operational in late 2011.

The Conca d'Oro-Jonio section will be a single dual-track tunnel, also built by TBM. It is scheduled to open in December 2012.

#### Line C

Substantial progress has been achieved both for the civil works and rolling stock of the first section of **Line C** from Parco di Centocelle to Pantano/Monte Compatri, with 15 stations. This first phase is scheduled to open in 2011 while the second stage Lodi-Parco di Centocelle, with seven stations, is programmed to enter in service in the second half of 2012. See newsletter #50 pp. 20-21.

As of **19 October**, rehabilitation and consolidation of the track bed on

### Clickable contents

- In focus*
- Tunnels under study*
- Invitations to tender*
- Contract announcements*
- Safety and rehabilitation*
- Site reports*
- Events and recognition*

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**SELI**

the surface section between Giardinetti and Pantano/Monte Compatri is in full swing, with a view to the commencement of technical outfit works. The first tunnel segment between Giardinetti and Parco di Centocelle is also ready to be fitted out, since the two **Herrenknecht** TBMs, named Shira and Filippa, have completed their job on that stretch. TBM #1 (Shira) excavated 3,995 metres of tunnel and placed 2,857 segmental rings, while TBM #2 (Filippa) building the parallel tunnel had nearly reached the San Felice da Cantalice shaft and installed 2,761 rings of precast concrete segments. The TBMs will be dismantled and transferred to the Malatesta shaft in the coming months to dig in the opposite direction to San Giovanni.

From the Malatesta shaft, TBM #3 (dubbed Diana) began drilling towards the San Felice da Cantalice shaft and had built more than 900 metres of tunnel as of 19 October, while in the same direction TBM #4 (Roberta) had completed 173 metres.

Crews work 24 hours a day, seven days a week in four shifts of 13 people for each machine. Each pair of machines needs about 220 people to operate.

Line C will connect the northwest to southeast of Rome, from Piazzale Clodio to Pantano/Monte Compatri in 45 minutes. It is 25.5 km long, whereof almost 18 km underground. Trains will travel in twin parallel tunnels. This €1,624 million 18.5 km first phase, with 22 stations, involves the use of four TBMs.

Entry in service of the first section Pantano/Monte Compatri-Parco di Centocelle is scheduled for December 2011. The next section Parco di Centocelle-Lodi will open to commercial service in October 2012 and the section Lodi-San Giovanni in December 2013. The entire Line C to Piazzale Clodio/Mazzini is expected to be ready in 2015.

Excavation of the San Giovanni-Colosseo segment (three stations) will start in January 2010 and end in December 2014. The Colosseo-Clodio/Mazzini stretch will commence in December 2010 and be finished in December 2015.



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*Contract announcements*

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