## Railway tunnels

## Milan-Genoa High Speed railway line

27 km base tunnel: 2 single track tunnel configuration with 1 underground safe area (about $35 \times 2 \mathrm{~km}$ of underground tunnel in total).

Works started in 2013.

## Genoa railway junction upgrading

The work concerns:

- A double track tunnel ( 2.8 km in length, 13 m in diameter)
- 2 single track tunnel ( $2 \times 1.4 \mathrm{~km}$ in length, 8 m in diameter).

Excavation works are in progress.

## High Speed Milan-Naples Railway line: Florence junction underground pass

The works include a 5 km EPB bored twin tunnel with an underground station. The works are foreseen to restart in 2015.

## Brenner Base tunnel

55 km base tunnel between Austria and Italy: the works include the construction of two single track tunnel ( 9 m dia.) with underground safe area every 20 km and a central exploratory/service tunnel ( 6 m dia.). Excavation works are in progress (exploitation 2026).

## Torino-Lione railway line - Mont d'Ambin base tunnel

57 km base tunnel between France and Italy: the works include the construction of two single track tunnel with underground safe area every 20km. Exploratory tunnel (Maddalena Tunnel) undergoing Italy side.

## Undergrounds

## Naples Underground, Line 1, Garibaldi-Capodichino extension)

Line twin tunnel of 6.7 m in diameter (excavation by EPB TBM and cut and cover method.

## Naples underground, Line 6 (Mergellina-Municipio extension)

The work concerns:

- A single tube tunnel of about $3,400 \mathrm{~m}$ to be excavated via an EPB shield of 8.30 m in diameter;
- 4 stations.

Excavation works started

## Naples underground, Line 6 (Campegna - Porta Del Parco extension)

The work concerns:

- a single tube tunnel of about $3,800 \mathrm{~m}$ to be excavated via an EPB shield of
8.30 m in diameter;
- 3 stations.

Excavation works is going to start.

## Milan Underground, Line 4 Linate Airport-S.Cristoforo)

The work concerns:

- a running tunnel of about $11,70 \mathrm{~km}$ in length, to be bored by using two EPB shield of 6.36 m in diameter;
- a running tunnel of about $3,70 \mathrm{~km}$ in length, to be bored by using an EPB shield of
9.15 m in diameter;
- 21 underground stations.

Excavation works started between Linate and Forlanini.

## Milan underground, Line 5 (Garibaldi-San Siro/Harar section)

The work progress of the line twin tunnel ( $6,755 \mathrm{~m}$ in length and 6.8 m dia.) and of 10 stations is $50 \%$. The line twin tunnel is over. Excavation Works of the stations are at $90 \%$.

## Rome underground, Line B (Rebibbia - Casal Monastero extension)

Line twin tunnel of 6.7 m in diameter, approx. 3 km in length, and two underground station. Excavation works are going to start.

Rome underground, Line C (S. Giovanni-Montecompatri/Pantano section)
Excavation works of line tunnels ( 18.5 Km in length and 6.75 m diameter) are over. Excavation works of 12 underground stations are in progress.

Rome underground, Line C (Fori Imperiali - S. Giovanni section)
Excavation works of 2 underground stations and line tunnels ( 3 Km of twin tunnels, 6.75 m dia.) are going to start.

## Road tunnels

## Pedemontana Lombarda Motorway, Dalmine-Como, Gaggiolo pass connection

Two tunnels (Grandate and Morazzone, 2,450x2 Km total length, 16 m dia. Works are $60 \%$.

## Modernisation of Motorway A1 Milan-Rome-Naples, Valico by-pass

Four twin tunnels (Val di Sambro, Grizzana, Quercia, Sparvo) (each tube about 180 m 2 cross-section. Excavation of Grizzana and Quercia tunnels is over. Excavation of Val di Sambro tunnel is 65\%. Excavation of the Sparvo tunnel ( $2.5 \times 2 \mathrm{~km}$ in length, 15.55 m in diameter), done by using an EPB-TBM (the world's largest TBM) is $70 \%$.

## Salerno-Reggio Calabria motorway

$6^{\circ}$ macro lot tunnelling works are in progress (400×2 m remaining out of $5000 \times 2$ $\mathrm{m})$.

## Quadrilatero (Umbria-Marche roadworks), 10 tunnels

Tunnelling works are over.
A14 motorway, Widening of 5 existing tunnels from two to three lanes + the hard shoulder

Works are in progress.

## Frejus safety tunnel

The works for the excavation of a tube about 8 m in diameter and 12.87 km in length, are in progress.

## New Colle di Tenda road tunnel

The project, which provides for the widening of the existing tube and the construction of a new $3,200 \mathrm{~m}$ long tube has been approved and financed by CIPE.

Final design is in progress.

## S.S. 212 "della Val Fortòre" and ex s.s. 369 "Appulo Fortorina"

Work include excavation of no. 4 tunnels, 15.20 m dia., and $2,700 \mathrm{~m}$. total length). Excavation works of Cerzone and Fuciello tunnels are over. Excavation works of San Pietro and Monte Leone tunnels (approx. 1.2 km of total length) are over.

## S.S. 106 Jonica (Sibari - Roseto Capo Spulico)

Two twin tunnel; total lenght about $5 \times 2 \mathrm{~km}$.
Final design in approving.

