

Key Figures – raw construction Ceneri Base Tunnel

Lengths, depths and distances

Total length of the entire tunnel and passage system	39,780 km
Length of the Ceneri Base Tunnel, north portal Camorino to south portal Vezia	
East tube	15,452 km
West tube	15,289 km

Drive

Total length driven by drilling and blasting (entire tunnel, cross-passages, exploration tunnels, caverns, etc.)	37,49 km
Tunnel boring machine drive	2,321 km
Daily advance rate with conventional blasting	
Average advance rate in favourable rock conditions	5,8 m
Average advance rate in unfavourable rock conditions	2,6 m

Heights above sea level and height differences

Height of top edge of rail at north portal Camorino	216,5 m
Height of top edge of rail at south portal Vezia	329 m
Height difference from north portal at Camorino to south portal at Vezia	112,5 m

Spoil management

Total volume of excavated rock	7,9 mil t
Concrete	1,1 mil m ³
Steel rings	4'200 t
Steel mesh	1 mil m ²
Rock anchors	1'123 km
Reinforcement	20'000 t
Sealing and drainage foil for vault	650'000 m ²

Geometrical parameters of the track inside the tunnel

Horizontal radius (excl. Vezia junction)	min 5'000 m
Vertical radius	min 25'000 m
Maximum gradient inside tunnel	6,8 ‰
Maximum gradient inside tunnel from Sarè junction	12,5 ‰

Geometrical parameters of the track outside the tunnel

Horizontal radius	min 300 m
Vertical radius	min 10'000 m
Maximum gradient overground section Nodo di Camorino	15 ‰

Various facts and figures

Standard distance between tunnel axes	40 m
Maximum distance between tunnel axes	210 m
Total number of cross passages	48 units
Ventilator	50 units
Standard distance between the cross passages	325 m
Maximum rock temperature	19 °C

Key Figures - Railway Infrastructure Ceneri Base Tunnel

Railway track

Ballasted trackbed	3,9 km
Ballastless trackbed (incl. track crossover link)	29,4 km
Concrete	33'500 m ³
Rails (incl. track crossover link)	66,6 km
LVT single-block system	98'000 units
Points	3 units

Overhead conductor

Overhead conductor in tunnel (approx. 97% overhead conductor rail)	2 x 15 km
Overhead conductor in overground sections	3 x 1 km
Overground mast foundations	100 units
In-tunnel supports	4'200 units

50 Hz electric power supply and cable systems

Optical-fibre cable	10'500 km
Copper cable	900 km
Electrical connection cabinets for cross-passage (50 % air-conditioned)	530 units
Electrical connection cabinets for the central infrastructure systems	80 units
Luminaires	800 units
Transformers	60 units
Handrail with integral LED illumination	32 km
Signs	2'600 units
No-break systems (emergency electric power supply)	4 units
Medium-voltage control panels	230 units

Telecommunication systems

Tunnel control system data points	25'000 data points
Emergency call columns	100 units
Telephone instruments	32 units
Network components	166 units
In-tunnel wireless communication amplifiers	72 units
Antenna cable	70 km

Safety systems

Balises	422 units
Axle counters	191 points
ETCS halt signals	65 signals
ETCS position signals	76 signals

Signal boxes

- principal position at Vigana
- remote points computer for Vezia

Radio Block Center (ETCS)

- RCB together with the SFR Ltd – Project Giubiasco

Railway control system

- Integrated in the existing control system of Bellinzona
- Operating station in the operations control center Pollegio with two on-site operating stations and one Tunnel Automatik

Test operation

- 2'243 individual test runs with a total of 40,182 km, since March 1st