



# BORGO VICO TUNNEL

## Como - Italy, 1998

### PROJECT CHARACTERISTICS

**Works:** project of a tunnel, underground works, portals and road junctions, services buildings, lighting, ventilation, traffic monitoring and toll gates.

**Purpose:** urban bypass road tunnel.

### Dimensions:

- Tunnel length: 3 km (3 portals)
- Section width: from 7.4 m to 18.9 m
- Excavation surface: from 52 to 149 m<sup>2</sup>
- Inside surface: from 37 to 115 m<sup>2</sup>
- Ventilation shaft: 7,5 x 180 m
- Project cost: 65 million US \$
- Traffic projected at yr 2005: 3500 veh/hr

### Subsurface conditions:

- Marl and Conglomerates

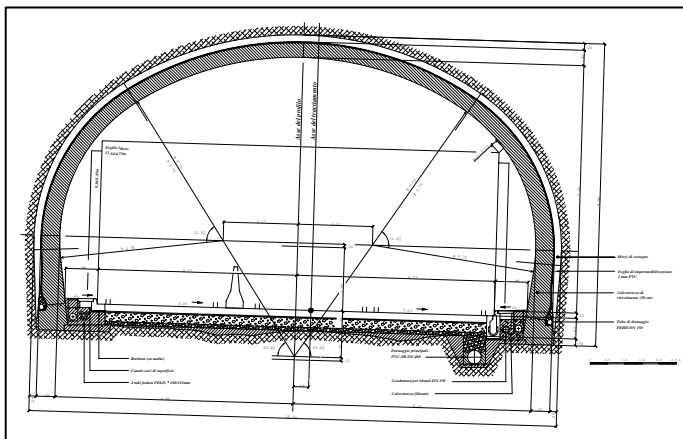
### Construction method:

- Head cutter, ripper and drill & blast



### PROFESSIONAL SERVICES PERFORMED

Preparing, in association with Amberg Ingenieurbüro, a **reference design** for bidding the construction of the tunnel on a project financing basis. **Design activities included:** topographic and geological surveys and selection of tunnel alignment, design of the tunnels, tunnel entrances and junctions with the existing streets, ventilation scheme, checks of traffic condition with numerical simulations, quantities take-off, construction planning, estimating costs, programming additional investigations. The project drawings were produced using DTM modelling and 3-dimensional CAD. Optical rendering and photo-merging were part of the project.



*Designing the urban bypass road tunnel for the downtown part of the city of Como required special precautions, due to its position with respect to the city buildings and to the presence of parks and the lake. Attention to air and noise pollution during construction as well as to landscaping and street furniture at the three entrances has been a priority item while developing the design.*

*Special attention has been paid in designing the new areas surrounding the tunnel ends and in improving, by hard and soft landscaping, the appearance of the streets at all intersections to increase the acceptability of the tunnel by the residents. Special care has been paid in lighting, ventilation and safety systems.*