

## BORMIO FOOTBRIDGE

Bormio footbridge. Bridge, design, work supervision, project manager.

### Client

Comune di Bormio

### Project, work supervision

Studio Calvi Srl

Project managers:

Prof. Eng. Gian Michele Calvi, Eng. Matteo Moratti

### Dati dimensionali

Deck length: 66 m

Number of spans: 1

### Classi e categorie dei lavori

Ig, IXb € 670.000,00  
(excluding foundation works)

### Start of planning

2003

### End of planning

2005

### Start of works

2005

### End of works

2005

### Bridge control and maintenance of cables

2012

### Project description

The bridge is designed to connect two parts of the medieval village of Bormio, in the Italian Alps, separated by a main road and Frodolfo river. On the west side it is located at the main centre of the town (with a population that may vary from three to twenty thousand, depending on the time of the year), on the east side, also dating back to the medieval age, several sky lifts reach altitudes of about 3,000 meters and create a very attractive ski resort, where world-class races are often organized.

The bridge has a single span of about 66 m passing over an important road and the Frodolfo river. The reinforced concrete deck is curved in plan and in elevation, and has a thickness varying between 280 mm and 450 mm and is sustained by single steel pylon, hinged at the base. The deck is formed by five pre-cast high performance concrete elements supported on 10 couples of thinner cables (22 – 28 mm diameter) mutually spaced at 6 m distance. Each segment has the same length (12 m) and the same radius of curvature both in plan (300 m) and in elevation (1200 m).

The concrete cross section is 3 m wide and the profile is completed by lateral aluminum noses (0.3 m length) integrated with the corrugated floor to prevent local vortex-effects caused by wind action. The bridge deck is about 5 meters above the street and about 10 meters above the river-bottom.



The main structure has been built in four days, without any temporary support, using five identical prefabricated deck sections, each of which is 12 m long, and a monolithic steel pylon 35 m tall to which the deck sections are anchored by means of four cables each. The bridge is technologically highly innovative, very light and beautifully inserted in the environment and very cost effective. It has provided a great benefit to the community (it is used by thousands of people every day, particularly during the high tourism season), in terms of reduction of walking distances, increase of safety and convenience.

Dynamics tests were performed in situ during the different construction stages. The pseudo-static and dynamic experimental response of the structure is compared with the results of finite elements analyses.



Above. Top of the antenna with view of the cables.

Opposite page, above. Full view of the footbridge. The environmental impact has been reduced thanks to the use of a streamlined walkway. The antenna is connected to the ground by eleven cables seven longitudinal and four in a transverse direction.

Opposite page, below. Construction phases of the bridge. The main structure has been built in four days, without any temporary support, using five identical prefabricated deck sections.

