

DOI: 10.24904/footbridge2017.09448

## TESTING MAJOR FOOTBRIDGES IN ITALY

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### Summary

In Italy every newly built structure must be “tested” (“collaudata”) by a so called “tester” (“collaudatore”) before being officially opened and used. According to the Italian regulation, the tester represents a third party in the building process who must be independent from the designer, the site supervisor, or the contractor, and has a vital responsibility for the success of a project, especially in public works. The tester is the person responsible for ascertaining that the as built structure is correctly able to sustain the design loads; this figure is therefore a sort of independent checker of the real structure.

After dedicating his whole career to bridges, both in the academy and the industry, prof. Siviero had the opportunity and the privilege of testing two of the most important footbridges built in Italy in the last decade.

The first one is the fourth bridge over Canal Grande river in Venice, **Ponte della Costituzione**, designed by Santiago Calatrava, a very well-known and discussed footbridge. The second one is the so called **Ponte del Mare** in Pescara, a twin curved cable stayed footbridge with the longest span in Italy.

In the form of an interview, the authors, which have been collaborating for many years, will tell the story of these two major Italian footbridges highlighting the most important challenging aspects related to their construction, as the control of the settlements in a unique environment in the first case, and the difficult control of the vibrations in the second one.

**Keywords:** testing; aesthetics; static and dynamic tests; structural concepts; structural response

### 1. Introduction

In the conference context of cultivating the debate, it appeared appropriate to tell some stories of a long and successful career to a wide public. Young designers can grow with the stories of more experienced colleagues, especially when the object of such stories is a relevant project. This is the starting point of the present contribution. The authors are a young designer in his thirties (Andrea Totaro), and a well-known and experienced designer (prof. Enzo Siviero), who have been collaborating in the previous years.

Before the beginning of their collaboration, prof. Siviero has been in charge of the static tests of two of the most important footbridges of the last decades in Italy, and the curiosity of his younger collaborator led him to look for a moment of knowledge sharing, organized in the form of an interview. The dialogue format appears to be particularly effective for exploring the “hidden” aspects of a project and of our profession as well, which are, although often overlooked, of key importance. The backstage of the collaboration with an “archistar” like Santiago Calatrava is definitely one of these.

The following paragraph will report the stories of these footbridges separately, and will be followed by some general conclusion in form of observations and comments coming from the interesting comparison of such different stories.

## 2. Testing the “Ponte della Costituzione” footbridge. Calatrava in Venice.

“Ponte della Costituzione” is a very well-known and discussed footbridge by Santiago Calatrava. It has been many times object of the Italian national news, because of its costs increase from what originally expected, and for other polemics regarding safety (slipping glass floor) or accessibility (a cable car has been added a few years after completion). All these peculiarities, and the intrinsic nature of a very hazardous design, made the role of the static tester very difficult. In fact, he had to somehow justify some arguable choices that resulted in a very expensive project. Back in 1995 Calatrava gave the concept of the footbridge to Venice for free, then Venice municipality announced the tender for the schematic and detailed design development, and Calatrava won it. The footbridge has been opened to public in 2008. The project cost was estimated around 2 million euros in the preliminary design phase, then 4 million euros at the schematic design phase, and 6,8 million at the detailed design phase. The final realization cost has grown to around 13 million. Because of the strong political polemics around the bridge, its inauguration was not even celebrated.



Fig. 1. Tested footbridges a) “Ponte della Costituzione” footbridge b) “Ponte del Mare” footbridge

## 3. Testing the “Ponte del Mare” footbridge in Pescara.

“Ponte del mare” footbridge, with its 466 meters of total length between the abutments and a single suspended span of 172 meters, currently represents the Italian longest footbridge. The idea of this footbridge arose against the proposal of a tunnel previously announced in the same area. Two political parties were fighting about this, but the public opinion finally supported the footbridge solution. The political background to this new footbridge was so strong that many private investors supported its realization with conspicuous donations, and a charity called “Pescara Abruzzo” funded a substantial part of it as well. Even the architect, Walter Pichler, decided to donate his project to the municipality, but it must be said that he was also the owner of the construction company (Stahlbau Pichler) in charge of the footbridge realization. The footbridge has been inaugurated in 2008 and it soon became a landmark and a new place of attraction for the city.

## 4. Discussion and Conclusions

A part from the analysis of two of the most interesting footbridges recently built in Italy, this contribution highlight some non-technical aspects, which are of the same importance, or more important for the final success of an infrastructure. The differences between the outcomes of the footbridge in Venice and the one in Pescara are evident in terms of public consent, and political background used to play a key role on this. It must be understood that an infrastructure is first of all due to a political choice. The Venice case where an “archistar” was called to realize a bridge, highlighted the disproportion of power between the parties, the designer archistar was even more powerful than the client. This had a huge impact on the project, in terms of final results, delays and legal dispute. Differently the Pescara case shows a more equilibrated situation where success has been achieved through collaboration between the different parties, and good procurements strategies. It also shows how good politic decision can determine the future of a place.

## 5. References

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