

LOADTEST O-Cell® Technology at the Po River, Italy



Project: **Po River Viaduct**

Location: Milano-Bologna, Italy

Client: Italferr.

Foundation Contractor: Trevi Spa.

Project Description: A new high speed railway line from Genoa to Milan required interconnecting the new infrastructure with the Giovi, Genoa - La Spezia, Genoa-Turin and Alessandria-Piacenza lines, and involving the inter-ports of Rivalta Scrivia and Milan South. This involved the construction of several new high speed railway lines taking trains at speeds of 300km/h.



High speed train reaching speeds of 300km/h

One section of the Milan-Bologna line between Alessandria and Piacenza required the building of a 400m cable stay suspension bridge over the Po River (the first of such bridges for trains built in Europe). The bridge has an open span of 192 metres.



Construction of the bridge underway

As part of this project, Piacenza became the site for the first Osterberg Cell (O-cell) tests to be performed in Italy. Minimizing disruption and impact on the environment was of the utmost importance for the whole project. Top-down static load testing would require a 50 MN test with either the construction of anchor piles or erection of kentledge and test beams. Loadtest provided an alternative solution in the form of bi-directional testing using O-cell technology.



Installation of pile cage with O-cell assembly

Load testing program

Two multi-level O-cell tests were performed on 2000mm piles installed by Trevi Spa. The piles were constructed using bentonite slurry to depths of 52.3 and 57.7 metres. Sister bar vibrating wire strain gauges were placed at levels along the pile shaft allowing a profile of net unit side shear to be determined as mobilised along the pile shaft.



Pile test in progress

Summary

By placing the O-cell at strategic elevations in the shaft, Loadtest was able to assess shear characteristics in specific zones, as well as isolate end bearing and total skin friction loads, mobilising a reaction of over 65 MN. These tests provided evidence of the technical merits of O-cell technology and the benefit the method can have by minimizing disruption to the environment.

The new cable-stayed railway bridge over the Po River, completed in 2006



Source: glfconstructioncorp.com

