

FEATURE OF TECHNICAL SERVICE

Subject

Executive Design related to the "Realization of the Genoa node freight network Upgrading interventions, for the replacement of the metal girders on the Polcevera bridge at km 0+995 of the Genova-Ventimiglia railway and the construction of the route variant of the stretch of line concerned from km 0+730 at km 1+335 to solve the interference with the new road layout of Canepa seafront"

Carried out by

SGAI srl of E. Forlani & C.

Client

COOPSETTE Soc. Coop.

Service length

2008 – 2012

Value of works

€ 18'067'255,05

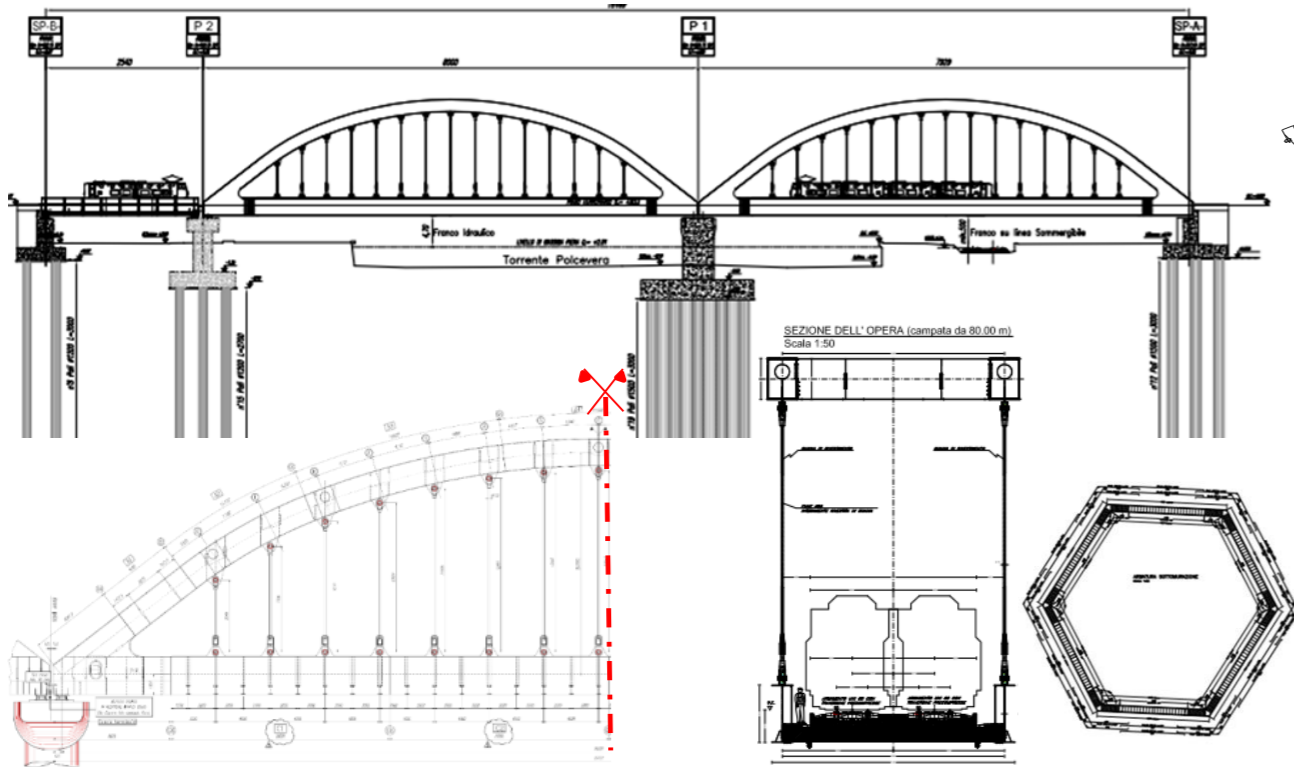
Categories value

S.03	€ 5'504'903,00
S.04	€ 8'540'428,80
S.05	€ 2'183'927,62
D.02	€ 190'184,23
D.04	€ 1'252'219,95
E.20	€ 74'403,57

POLCEVERA BRIDGE - Design issues and their resolution

The bridges and viaducts present in the Executive Project are three: **Polcevera Bridge**, which overpass the Polcevera creek, made with metal deck and the first beam span of 22.4m and 2 lower arc spans in simple support of 78.5m each; the **Largo Jursè bypass** in order to climb over the underlying road junction, with steel structure and static beam pattern resting on two spans of 23m. The main design problems were found during the execution of the substructures in the riverbed of the Polcevera Bridge, due to both the heterogeneous geological framework and the problems of undercutting phenomena and groundwater level typical of the riverbed at torrential capacity of Polcevera creek, as well as the presence of numerous sub-services and nearby works. Thanks to an accurate geognostic campaign (geophysical surveys, direct surveys in situ, surveys and laboratory tests) combined with the execution of garrison works to protect the works of foundation and underpinning, especially for the pile in the river, was work and the construction of the work can be carried out.

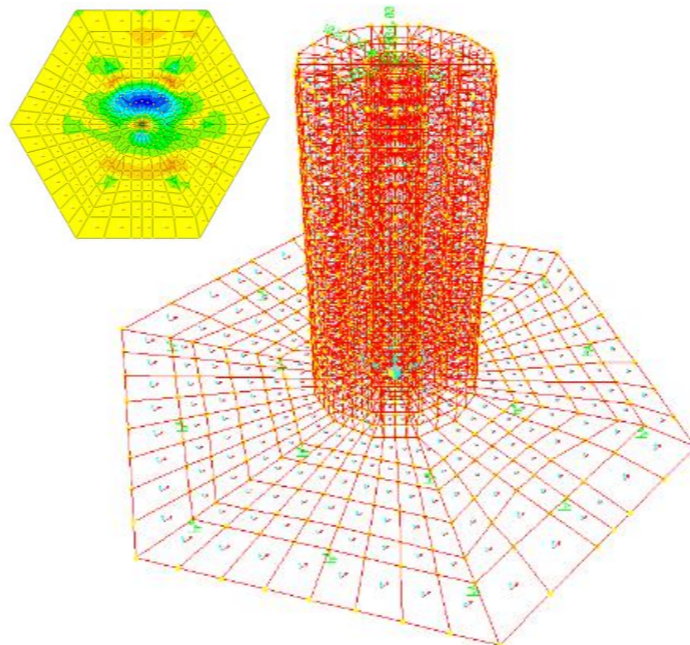
Longitudinal profile, cross sections and structural details POLCEVERA BRIDGE



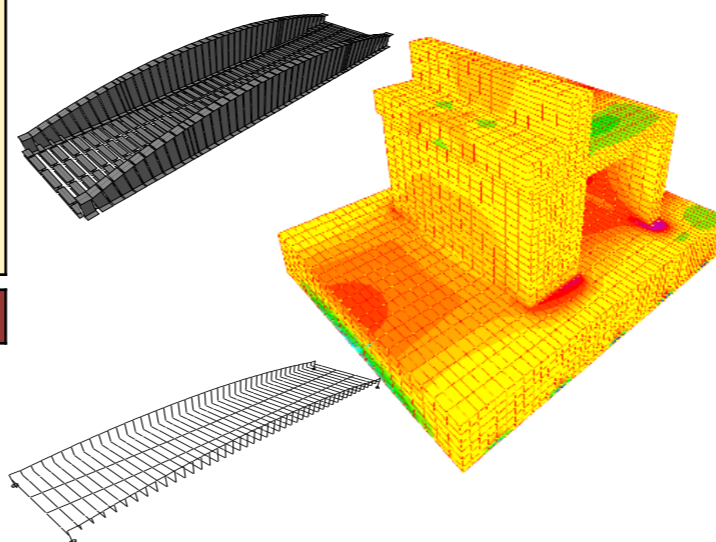
POLCEVERA BRIDGE AND LARGO JURSE' BYPASS - Computational aspects - Simulation, results and checks

The analysis and study of the static and dynamic behavior of the substructures of the different bridges and viaducts was conducted by simulating the structure with a three-dimensional finite element numerical model, solved with SAP 2000 calculation code (C.S.i. Computer & Computer & Structures, Inc.: "SAP2000 Integrated Software for Structural Analysis and Design" Ver. 8.2. Berkeley, California (USA). 2002

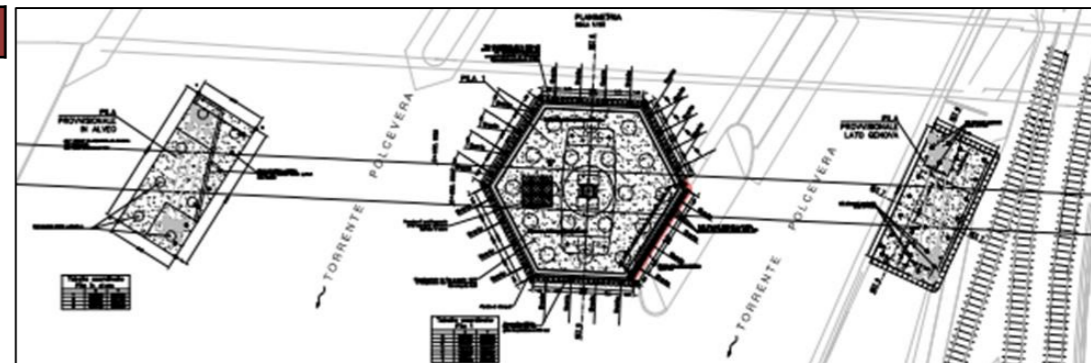
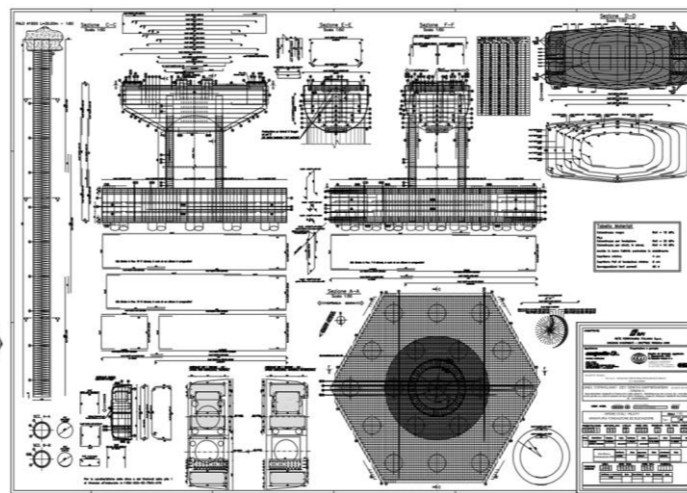
POLCEVERA BRIDGE Numerical model



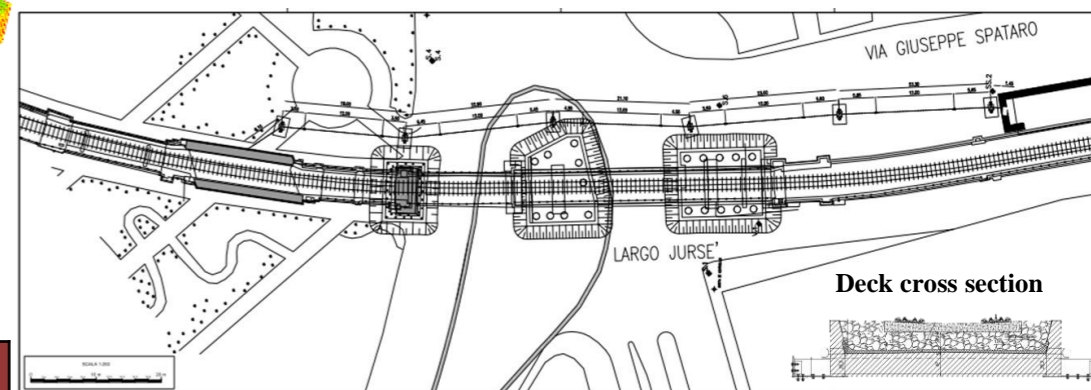
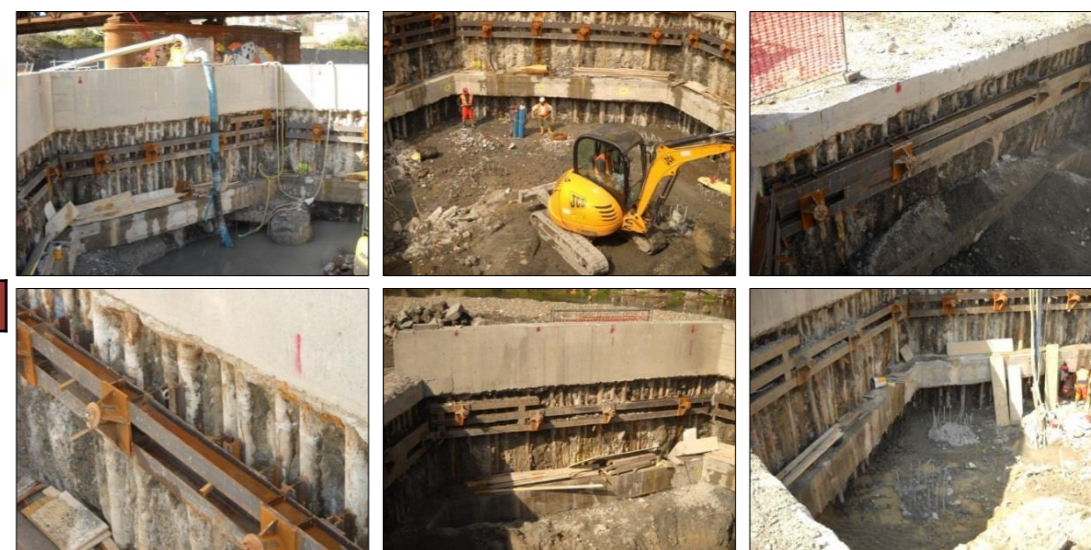
LARGO JURSE' BYPASS Numerical model



Substructure steel reinforcement details



POLCEVERA BRIDGE provisional works of protection in the riverbed - executive phases



LARGO JURSE' BYPASS provisional works of protection outside the riverbed

