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

RAILWAY LINE AND CONNECTION - Design issues and their resolution

As part of the **Executive Design** of the upgrading of the freight network in the Genoa node, planned on the F.S. Genoa Sampierdarena-French bounduary from km 0+730 to km 1+335, a new plano-altimetric solution of the rail track has been studied that would allow to:

- Raise the minimum free height of 5.00m below the Polcevera Bridge at the Submersible line;
- Adapt the plano-altimetric alignment of the "Pari" and "Dispari" railway line in accordance with the new project works and existing limits on Savona side and Genoa Sampierdarena side;
- Check the position of the binary connection Switch of "Pari" and "Dispari" railway line and insert them within the same level gradient, compatible with the existing line;
- Ensure the travel on rail track at speeds of 60km/h for the initial section and insertion curve on the Sampierdarena side bridge, and 85km/h for the Savona side junction and insertion between the two curves and the 30m minimum length straight;
- Accommodation and safety of road traffic on Largo Jursè and related interference;
- Inserting standard binary switch of the type S60 UNI / 400 / 0.074 into the interconnection.

The design of the variant involves the construction of two main WORKS: "**Polcevera bridge**", "**Largo Jursé bypass**". In detail, the main design issues were encountered in the study and verification of the attack zones and connection of the variant to the existing tracks on the Savona and Sampierdarena side, which required a careful study of the detailed surveys.

Foto 3 –Polcevera bridge

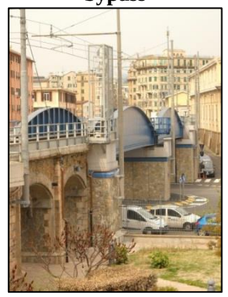
Foto 1 – Bridge launch of first span of the Polcevera bridge

Foto 2 – Bridge launch of second span of Polcevera bridge

VIADUCTS, BRIDGES AND BYPASS	
-	N. 1 Arch steel bridge of span 78.5m: "Polcevera bridge"
-	N. 1 Steel bypass of span 23m: "Largo Jursé"
-	Numerous boxes, sustain walls/bulkheads and minor works

Foto 4 – Largo Jursé bypass

Foto 5 – Deck of Largo Jursè bypass

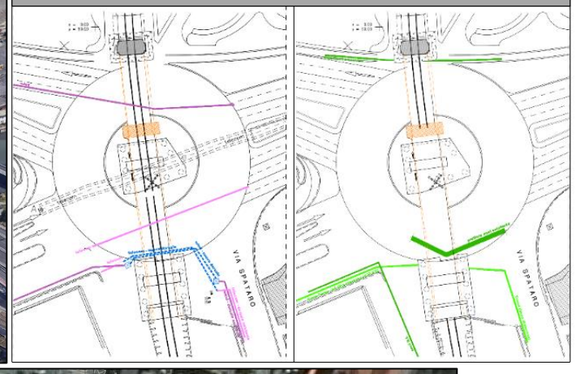


RAIL TRACK – Modeling, interference and checks

The analysis and study of railway tracks was conducted by three-dimensionally modelling the morphology of the terrain and project infrastructure with the help of a dedicated road design software (*Bentley Moss MX-Road - Ver. 08.11.09.845*), thanks to which it was also possible to check the detail relief variances and the correct connection of the axes with the existing line.

Aereal view of infrastructure

Largo Jursé interference and road resolution Plan



General infrastructure plan

ROADS AND RAILWAYS