

A stainless steel pedestrian bridge on the River Po

by Tiziana Moro

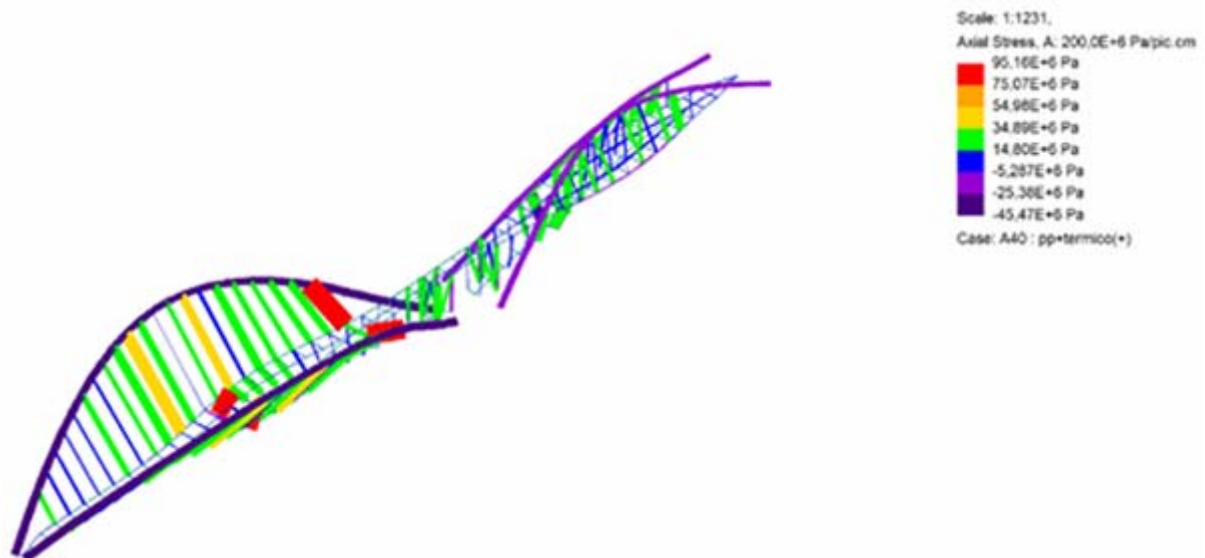
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This thesis develops the project carried out during the Design Unit “*Structure and Construction Shape - Steel Pedestrian Bridges*”, focused on an area at the confluence of the River Stura di Lanzo and the River Po.

The choice of the site is related to the intention to locate in that area *Floriade*, a flower exhibition during the event *Esperienza Italia 2011*. The main objective of the proposal is to respect the most advanced principles of energetic and environmental sustainability.

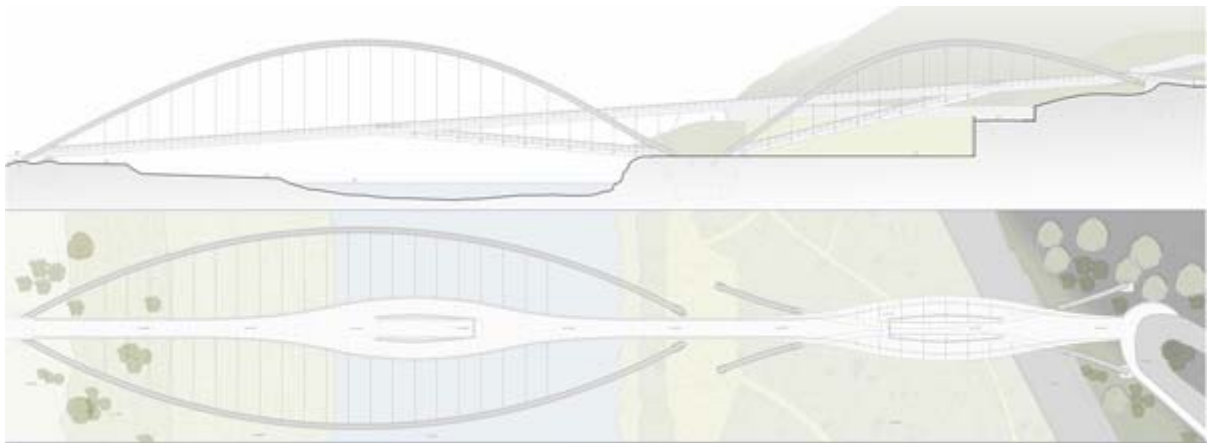
A Masterplan has been designed, characterized by connections with footbridges between green areas. I've proposed new activities to display in the parks, new relationships among different areas, the valorization of buildings and the already existing road networks. Ultimately, the attention of this work was focused on the planning of the project and the pre-dimensioning of one pedestrian bridge, using the *Oasys GSA* software. I chose the shape and the construction materials firstly in relation with the environmental qualities of the area and secondly to respect the configuration obtained by the tests on the *FEM* model.



The *FEM* model obtained by an iterative process looking for the best shape

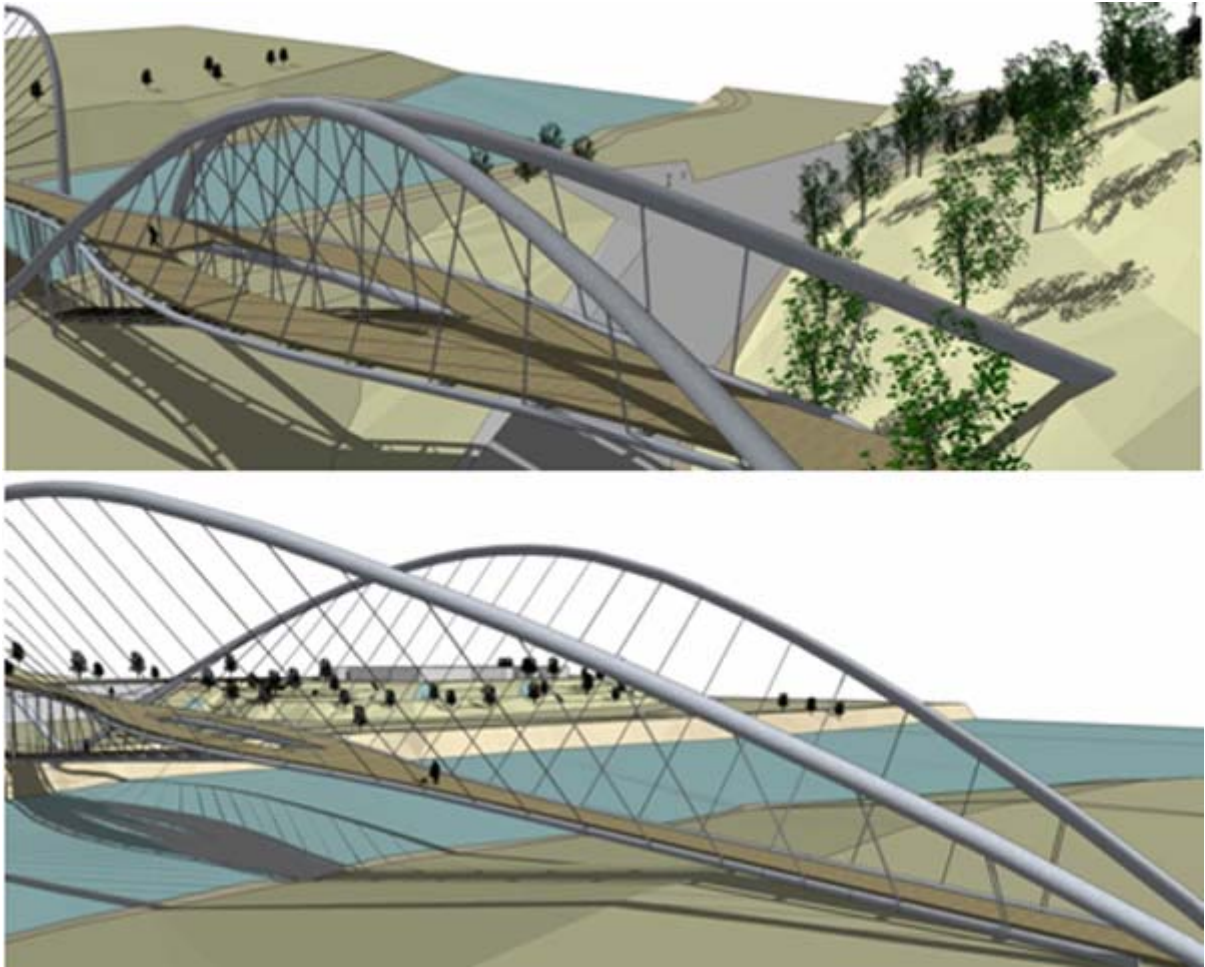
The location is a challenge for the completion of the equipped area and to introduce a crosswalk to link the banks and to complete the nature trails offered by the city, with the goal of making the area usable by respecting its natural high qualities, thus giving the project the added value to serve the community.

The different height of the banks and the impossibility to place supports along the road and the river, inspired the idea of a footbridge to be suspended at a pair of arches of different heights and lists, that defines the dissonant nature of said areas. The curve that results from the arches progress produces a distinctive optical effect: the two pair of arches land in the park to be reconnected within the same foundation, giving the idea of continuity at the bearing structure and an inclusion in the environment. Their height is determined by the inclination of the hill behind, respecting the optimal configuration obtained by the numerical model. In correspondence to the centre-line of the river and of the park, the footbridge splits into two thus allowing the descent into the park.



The pedestrian bridge on its environment (plan and elevation)

This architectural work has been conceived as a public place where walking as well as stopping to take a look and admire the landscape and to recreate a contact person-park-river. The walker crossing the footbridge is invited to have a rest on the benches on the virtual space generated by the suspension cables, to appreciate the background, the hill and the island framed by the arches. In order to introduce facilities, small buildings with a curved roof have been hypothesized, designed to be for external as well as for internal use. The spaces at ground level will become parking lots. This offer of new facilities should increase the accessibility to the park and it might help to direct pedestrian and cyclists onto the footbridge, in order to guarantee both usefulness and functionality to the work.



The dissonant characteristics of the two parts of the footbridge

With the purpose to create an object that can easily camouflage itself within the environment, and due to its strain characteristics, duplex 2205 stainless steel with a 2R finish and electro-polished has been chosen for the main construction, in order to guarantee the highest level of reflectivity of the environment. Stainless steel has an attractive look, an excellent corrosion resistance and good mechanical properties. Although requiring high start-up costs (estimation of the Life Cycle Cost with values given by the Italian Stainless Steel Centre), in the long term it guarantees savings, and a good compatibility with different environments for a number of reasons but above all for the reason that it doesn't require any maintenance and hence there is not risk of repeated interventions on the surrounding area; besides, stainless steel has a long life cycle. These choices have also been supported by a special course that I attended at the Italian Steel Industry Association.

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