POLITECNICO DI TORINO
SECOND SCHOOL OF ARCHITECTURE
Master of Science in Architecture
Honors theses

Footbridge: a new link between Valentino's Castle and the hill
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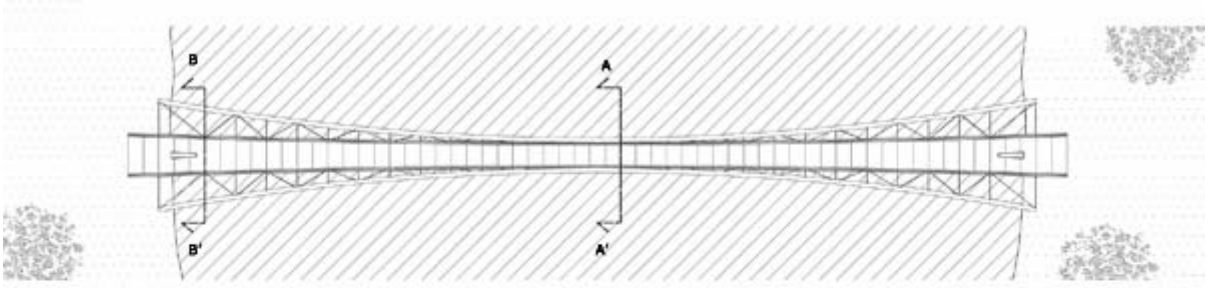
The aim of the thesis was to project a pedestrian crossing for the façade of Valentino's Castle in Turin. The main difficult has been the insertion of the new structure inside an historical urban context of considerable importance.

During an International Exhibition in 1911, a wooden bridge was build inside the Park in order to join the stands inside the Castle with those on the other side of the river Po. Being aware of this historical precedent which gave further value to the idea of our project, we searched for some examples concerning the insertion of modern elements into a urban context of historical importance. It emerged how the projects we analyzed, even if regarding different circumstances, clearly show a modern taste in the materials' choice, shapes and colors. However , at a final glance, their use is totally in harmony with the ancient buildings and the environment all around.

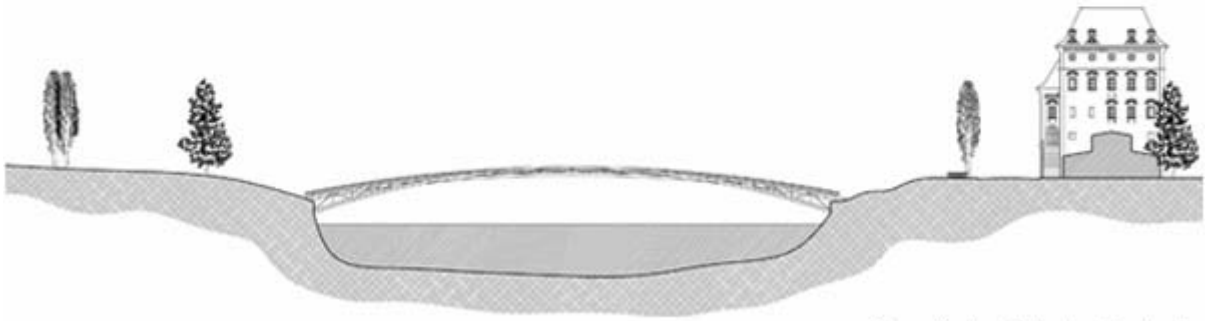
Analyzing the area of our the project it is clear that this is developed on both of the river's banks. Notwithstanding the latest requalification in the hill's side, the main activities of the park still take place on the West-side of the river Po: the only crossings are in the far end of the park and each is 600 m faraway from the other. With the purpose of increasing life and activities in the East-part of the park, we decided to promote a new crossing which could join different pedestrian paths already existent. We devoted particular care conceiving the new crossing halfway the two others existent bridges.

The park boast the presence of an historical and beautiful building: the Valentino's Castle. Considering the importance of such an ancient castle in the park and his location, we established the new crossing exactly in front of the façade of the castle. In this way, we offered the park a central crossing through the river with a certain contribution in the requalification of the hill's side. At the same time, new value and prestige would have been given to the castle with the insertion of our structure.

After we studied the area and many interventions in similar situations, some goals were established: to think about an openly modern structure harmoniously contrasting with the contest; moreover, a low but slender structure, in order not to contrast deeply with the environment and to keep possible the river navigation. According to our analysis, the most suitable typology was the one called arch structure. To avoid any interference with the image of the historical façade, we decided to keep a 11,5 relation light-arrow.

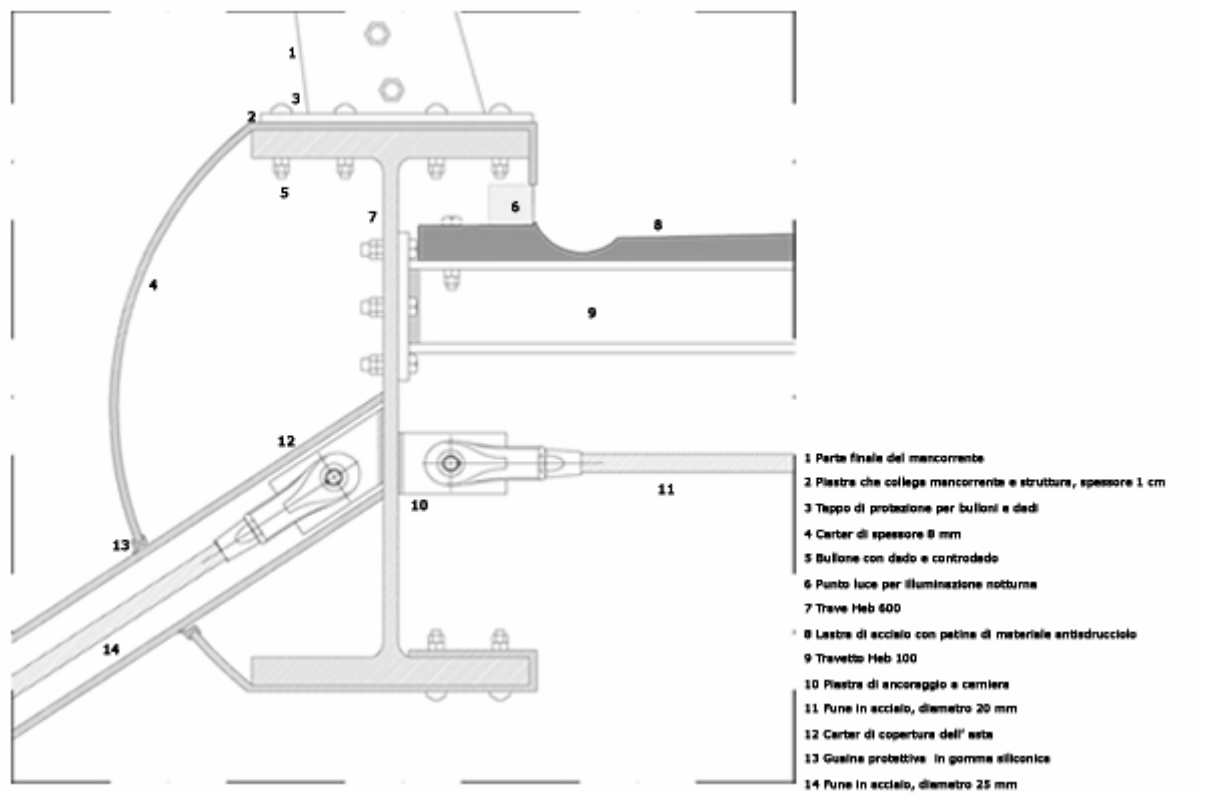


Estradosso del ponte - fuori scala



Prospetto longitudinale - fuori scala

Furthermore we opted for an arched bridge strongly lowered.
The supporting structure is constituted by a pair of tubular stainless steel outside the gangway and by two HEB 600 beams.



The rigidity are considered by the calculation program as auctions: elements hinged to the ends that meet only a normal effort.

To satisfy the ultimate limit state (ULS) we found out the loads applying the factors indicated by the Ministerial Decree of 2008 concerning the technical regulations . The graphs to study the bending moment and the normal effort regarding the bearing structure show how this is completely compressed.

The deformation turn out to be symmetrical both if compared to the longitudinal axis and the transverse one.

The dynamic analysis allowed us to verify the structure's vibration ways and to determined the frequency and the oscillation periods to check if they were included among dangerous frequency ranges. It has not been possible to verify some ranges of frequencies. For this reason it would be necessary to supply the structure with some dampers of oscillations, to assure its safety and guarantee total comfort to users.

The stiffening elements are placed in line with the centroid of the beam, in order to avoid torsional internal efforts.

As far the bearing arches are concerned a joint section of steel and self compatting concrete have been chosen permitting to obtain remarkable dimensions and improving the resistance of steel during compression.

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