

Honors theses

A tower for sports in Paris: a beam-wall structure

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The thesis develops a project begun in the course “Structure and constructive form”: a “tower for sports” in Paris, in the oriental extremity of the ZAC (“Zones of Aménagement Concertée”) Paris Rive Gauche.

The site, characterized by important urban transformations in the last 15 years, has recently become object of a debate on the legitimacy to build tall buildings and “towers” in the center of Paris. The project of “a tower for sports” get into this challenge.



The project of the tower is developed in three phases:

- A first phase of acquisition of knowledges in technique of constructions: this is to be able to conceive a simple beam-wall structure.
- In the second phase I went to the site of project and I tried to understand which are the specific qualities of the tower in relationship with the context, also keeping in mind some particular points of view on the monuments and on characteristic places in Paris.

- The third phase: development of the project. I get the “definitive form” of the tower, I developed technological details, I calculate the efforts and I hypothesized a system of assemblage with pieces of beam prefabricated kept together through cables of pre-compression.

The architectural idea is a structure of very particular beam-wall: every gym or room for sport is conceived as a “box”, and overall the tower is built as an overlap “free” of the single “boxes” around a central nucleus of distribution of 15m x 15 m.

The beam-wall structure allow to get volumes with strong starts: the expressive strength of these starts is that these volumes seems “miraculously” suspended in air, and these expressive effects are strengthened by the principle of alternate assemblage of the single volumes the one above the others.

The boxes, rotated among them of 90 degrees, are directed according to the sights of which they can profit.

The tower proposes an unusual spatial experience for the **not-competitive sporting activities**.

But the tower is not only sport: it also contains other functions displaced in the base and in summit: the reception, the infirmary, a small cafe, the administration offices.

The box in the top of the tower contains a **panoramic restaurant** and a **disco**.

The vertical distribution happens inside the **nucleus**.



The climatic control of the boxes happens through natural ventilation: openings with computerized thin plates in the glass door that close the short sides of the boxes using the **displacement system**, with the immission from the lower part and the resumption from the tall one, they assure clean air to level of the people.

In the extreme periods (summer and winter) a battery, set at the base of the glass door, it preheats the air in entrance.

The beams wall, with their notable dimension and for a better facility and speed of assemblage, are been thought as prefabricated concrete pieces, climbed on in sequence and extended through cables of precompression.

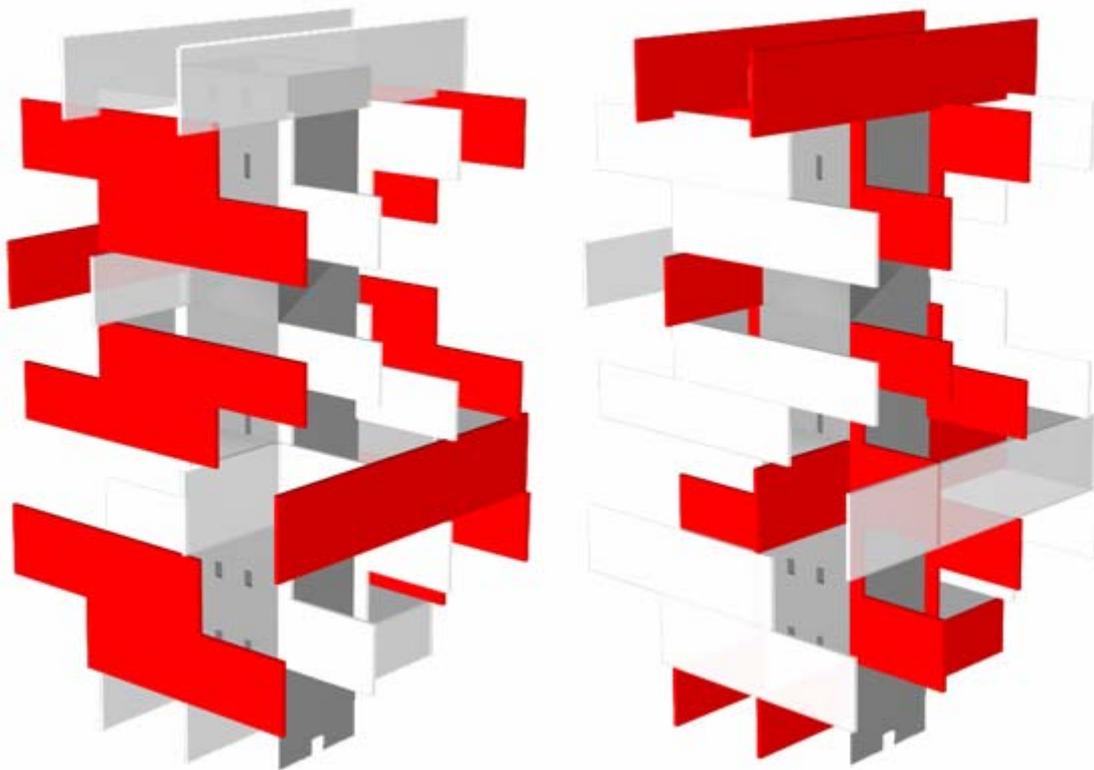
These pieces, that have always such dimensions to be able to be transported by truck, arrive in yard already predisposed for the insertion of the cables with scabbards drowned in concrete.

This system of assemblage is habitually used for the construction of bridges and viaducts.

To exalt and to underline the structure and the system of assemblage I decided not to dress the beams leaving them at sight: through a dynamic game of truths and false forgeries the structure becomes it same decorum.

The structural examination is divided in **3 phases**:

- **feasibility study**: Analysis of the loads, Analysis of the horizontal strengths (sisma and wind), Pre-dimension of the beam more solicited and of a meaningful beam.
- **study of the scheme of assemblage**: The carrying beams, outgoing directly from the nucleus, they are climbed on in sequence; the brought beams are, according to the cases hung or supported in at least 2 points to the carrying beams. The beams are climbed on in sequence so that the structure both always able of sustainitself.
- **study of detail**: the pre-compression in the pieces of beams. The study proposes, for one of the beams of the tower, a sequence of assemblage, establishes the loads to it will be submitted, it hypothesizes the optimal cables and it verifies the tensions produced inside the structure. Analysis is developed in two phases: in the first phase I is analyzed the condition in which I have only the proper beam weight . This is in the phase of assemblage. In the second phase the due loads to the attic are considered, also to the crowd and the load coming from the superior beam that supports him to that analysed.



Scheme of assemblage

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