POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE 2
Degree in Architecture
Honors theses

Floating Monolith. Applicative technologies of the lightweight concretes
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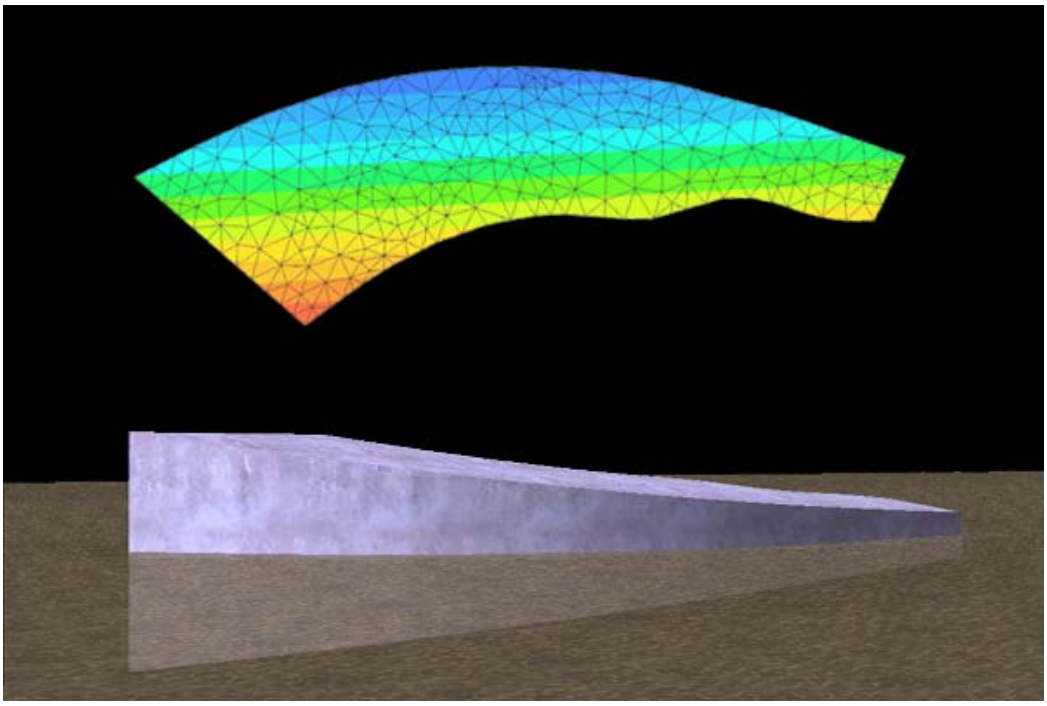
The work of the degree thesis was developed in collaboration with the Department of Plastic Art (prof. Auslender) and Planning (prof. Lorch) of the Tecnische Universität Darmstadt, in Germany.
The treated subject touches on different disciplines like architectural planning, sculpture and application of innovative materials.
The project consist in creating, in an area along the Neckar river, a floating structure, at the same time work of elevated plastic quality and highly technological architectonic object; a fixed point in the natural space. A monolith.
Completely realized in Flowstone concrete, in only one jet, it's light, floating and transparent. The monolith, place of meeting and cultural events, in the winter months floats on the meadow overflowed from the periodic floods of the river.

South view of the monolith during the summer, no-floating phase

After a beginning check-up to Heidelberg in order to analyse and to collect photographic and paper material of the site, be started, with the Italian teachers, the first phase of analytical work.

We have analysed the functions and the landscape and than we concentrate on the study of the materials with particular attention to the concrete in its several applications, to the acrylic panels, of which are constituted all the windows, and to the optical fibres, used for the realization of the transparent concrete.
At the same time begun the planning work, in continuous relationship with the German professors, trying to develop a suitable architectonic shape, also in order to the floating.
During the project, have been studied various shape solutions before that definitive one, for which have been calculated, with the professors of the Polytechnic of Turin, the structural and technological feasibility and the floating.
Trough the utilise of the software Diana, based on finite elements analysis, we have studied the floating, the structural dimensioning and the calculation of the stresses and the reinforcing bars.



Floating analysis realized with the software Diana and view north of the monolith in phase of floating

Later, have been analysed the accesses to the structure also in phase of floating, the watertight doors, used in naval field and in the main submarine aquariums, and aspects connected to the refuse water and drinkable water, to render the monolith an independent structure.
The last step of the work that consists in the realization of the formwork and the model in concrete, was carried out entirely in Germany, with supervision and assistance of the professors of the Department of Plastic Art.
We have realized, in addition to the formwork for the model, also two test-piece of transparent concrete, laying optical fibres into the concrete jet.

Through utilize of optical fibres is possible the passing of light from one surface to the other of the concrete for a maximum thickness of 6 meters, conferring some transparency and lightness on the object.

Transparent concrete blocks realized with optical fibres

The treated work gave us the chance to face new topics like the floatation and the transparency of the concrete, usually heavy and opaque material, and to put us in contact with conceptual and plastic processes unusual for us, allowing to compare two different ways to think the architecture.

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