POLITECNICO DI TORINO
FIRST SCHOOL OF ARCHITECTURE
Master of Science in Architecture (Construction)
Honors theses

Design with water: from the competition project *H_2Ousing* to *Intelliglass*
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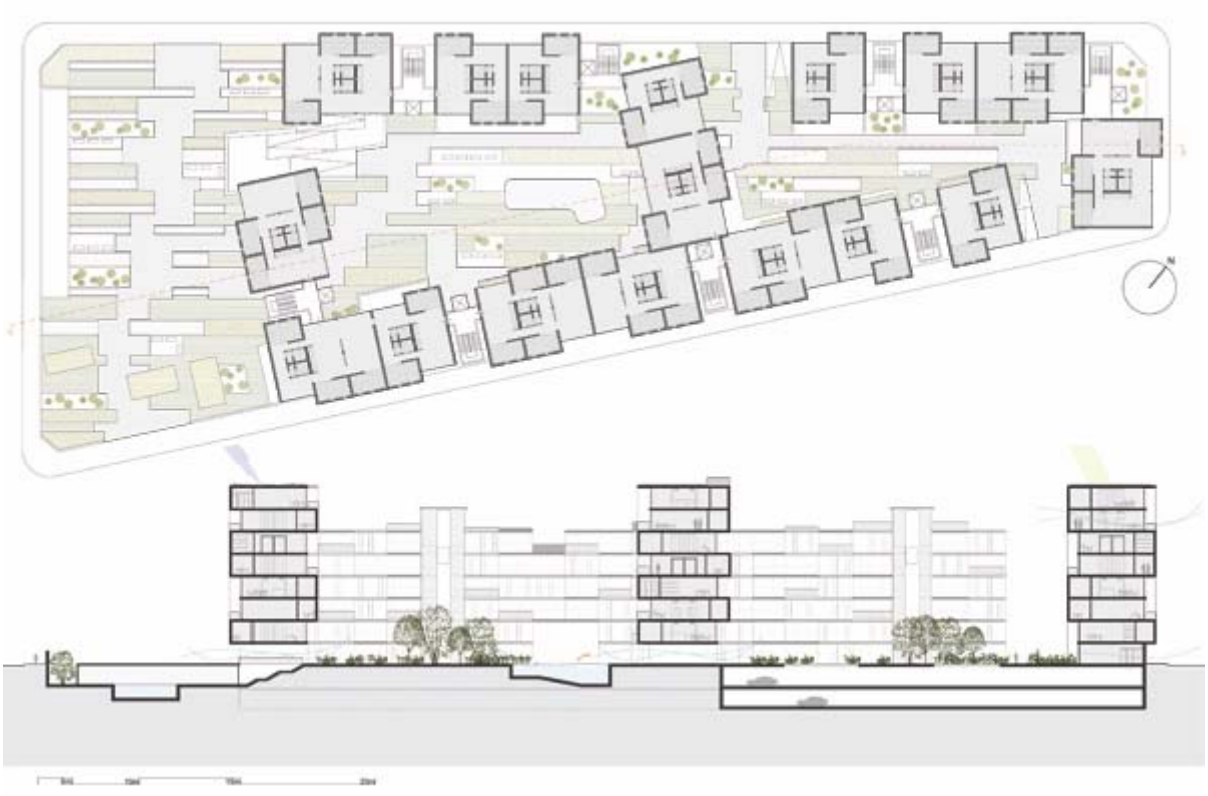
The thesis project elaborates the theme of the international architectural competition *"ECOLOGICO?S.O.S.tenible"* which I attended in 2008. The competition was opened to students and young architects and was issued by the *European University of Madrid* in collaboration with the real estate firm *Iberdrola*. The competition request was the design of a residential block near Seville based on energy efficiency to be achieved through use of water as a distinctive and innovative element of the building. The water was seen as "material" in order to contrast the warm climate of the region. Looking for the answer to the competition rules I started a research about the use of water in architectural design.
The discussion started form a general perspective on how water characterized the construction forms in different geographic areas and historic periods. Water has many proprieties, one of these is to absorb solar heat that could be very important for the warming climatic zones. The research about water architectures underlined some examples concerning the application, of the fluid, on two construction components: the roof and the facade. These water incorporations provide a good insulation to the exterior winter environment and protect from the heat caused by solar radiation.
Thanks to the Spanish study experience I sought a possibility to answer to the competitions requirements: the *Intelliglass* technology, a double glazed system which incorporates water circulation in its inner chamber. This technology allows to combine glass elements with water, which becomes technical and transparent element.
The general design proposal for the competition develops living block around three voids which define the private and collective zones. Each apartment has an open living space characterized by wide windows, while the bedrooms are more closed to the outside with an opaque solid facade.



General plan and section of *H_2Ousing* project

The wide windows are realized with the *Intelliglass* system which results the most innovative element of the project, especially in a city like Seville. The excessive summer heat and the problem of inside overheating are solved by use of the double glazed system with water. For the winter situation the *Intelliglass* technology provides thermal insulation and passive solar gain through a more static circulation of the fluid in the glazed chamber.
The thesis project develops the architectural and technological research on the same topic thanks to the direct collaboration at the *Intelliglass Laboratory of Madrid*. I studied the main ideas and steps of the “intelligent” system origins, analyzing its technological constructive parts. The realization of this double glazed system has the aim of use water capacity for absorbing solar heat and obtain a more functional and economical conditioning system.
For the technical analysis I also studied other similar elements, but this active water system is easier adaptable to architectural forms even if the technology has some defects for dimensions and openable elements. Nevertheless the good operation of this system is demonstrated by some architectural realizations, where this patent is adapted to standard frame supports of curtain wall and roof windows.

Volumetric scheme of unit and project 3d view

Regarding the different functions of the *Intelliglass* technology, I reconsidered the living unit of the previous competition proposal. The interior is now a fluid open space characterized by high standard comfort. The new unit is generated around an installation core with vertical and horizontal partition made by the *Intelliglass* system. The living space is developed around the installation core and it has an *Intelliglass* facade. Moreover the bedrooms are solid projections with an opaque external facade while their inner space is defined by sliding walls. The interior area is characterized by indirect light effects from the opposite transparent facade. The study of the technological detail is the result of *Intelliglass* experience which integrate the previous project proposal.

Inner view of the new living units

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