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

The Desert Challenge, Premiere Architectural Student Design Competition for Sustainability and Energy
by Silvia Gandolfi and Luca Gentilcore
Tutor: Silvia Gron
Co-tutors: Valentina Serra, Valerio Lo Verso

The challenge sets for 2003-04 from **The Leading Edge Student Design Competition** is focused on educational buildings in desert environments, in particular involves problems of sustainability and energy-efficiency for the college site in Palm Desert, South California.

The project
Four self-functional blocks have been individuated, these units are structured accordingly the *pueblos* organization in which autonomous houses look into the *plaza*, a public shared area designated for group activities. The square area of the competition has been shown to be particularly suitable for buildings organized in court style.

The four self-functional blocks.
The *common area*, includes: the entrance hall from which every functional areas may be directly entered. This area is connected with the *information point* (south) and a small *auditorium* (west) which will be opened to the Palm Desert community during night hours.
The second functional area is designated for *administration* offices; school director office, secretary offices and work rooms (east).
We also distinguish the *department areas* in which twenty offices and one work room give shape to a space entirely dedicated to lecturers (north).

Finally, the teaching area is equipped by two computers rooms and sixteen traditional rooms with a high level of adaptability.
The block volumes are placed in order to build different pathway to the central courtyard. These covered corridors connect the different functional areas, besides they create an interaction between buildings and surrounding context: the east opening allows the entrance into the big meadow on which the school buildings look at, whilst toward west the walls allow to look out on a wonderful view of San Giacinto and San Bernardino mountain ridges.

The solution plans to display the distributive systems on the courtyard, using volumes particularly closed toward the outside; the walls of raw mud are interrupted by narrow vertical cuts which allow a fragmentized view of the landscape. Despite, toward the inside court the volumes are wide open, thanks to the moveable glass walls located on the ground floor, in the offices, departments and auditorium. The glasses can be opened completely during summer period, creating both covered and shaded spaces directly connected with the court.

On the second floor classrooms are linked by galleries which allow students to look out over the inner meadow. The whole project is balanced between inside and outside, between areas to be lived or watched, suggesting many different point of views. A good example is represented by the two stairways which lead on the classrooms floor: the landscape is revealed step by step coming upstairs through the external skin.

The formal project of this architecture remains linked to the specific climatic needs, which have been lead to chose a thick walling in *adobe*, traditionally used for warm-dry weather.

The wall is shielded with a shade skin of wooden louvres. As for a box of matches, the translation toward south of the outer skin allows the creation of a wide portico which shadowed the entrance façade whilst the north façade is completely uncovered. The protection system of the façade on the east and west sides is compounded by vertical louvres. The classrooms are supplied with a shadowing system which is mechanically adjustable in order to manage the solar radiation accordingly didactic needs and more generally thermal requirements: different thermal gains or even the complete shadowing of the solar light.

The light analysis is developed into the CERSIL laboratories at the Polytechnic of Turin.

Daylight mean ratio = 5.36%

Light uniformity min/avg = 0.87
Min/avg = 0.77

For further information, e-mail:
Silvia Gandolfi: silviagandolfi@libero.it
Luca Gentilcore: luca.gentil@tin.it