
The Leading Edge Design Competition 2006 - The Great Park – Orange County, California. Environmental Museum and Interpretative Center

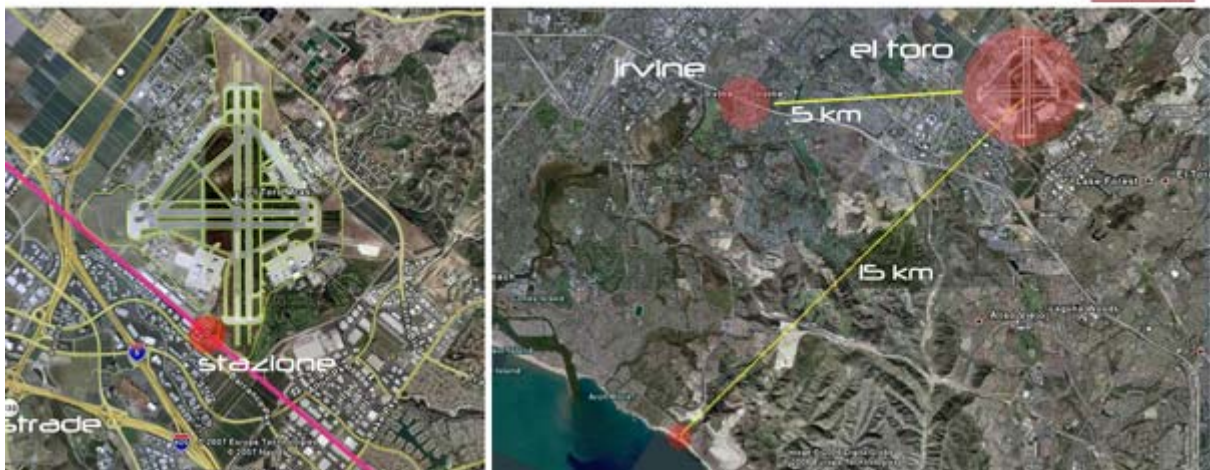
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The thesis plan is born in parallel with the participation of the international competition The Leading Edge Competition Design 2006 and a period of search near the Institute of Italian Culture of Los Angeles and the University UCLA and SCI-ARC. The competition previewed the transformation of the center of Aviation of Navy “El Toro”, by now discharged, into a great Natural Park of the Orange County (in Irvine, California) in which place an Ecosostenibile Museum and an Interpretative Center.



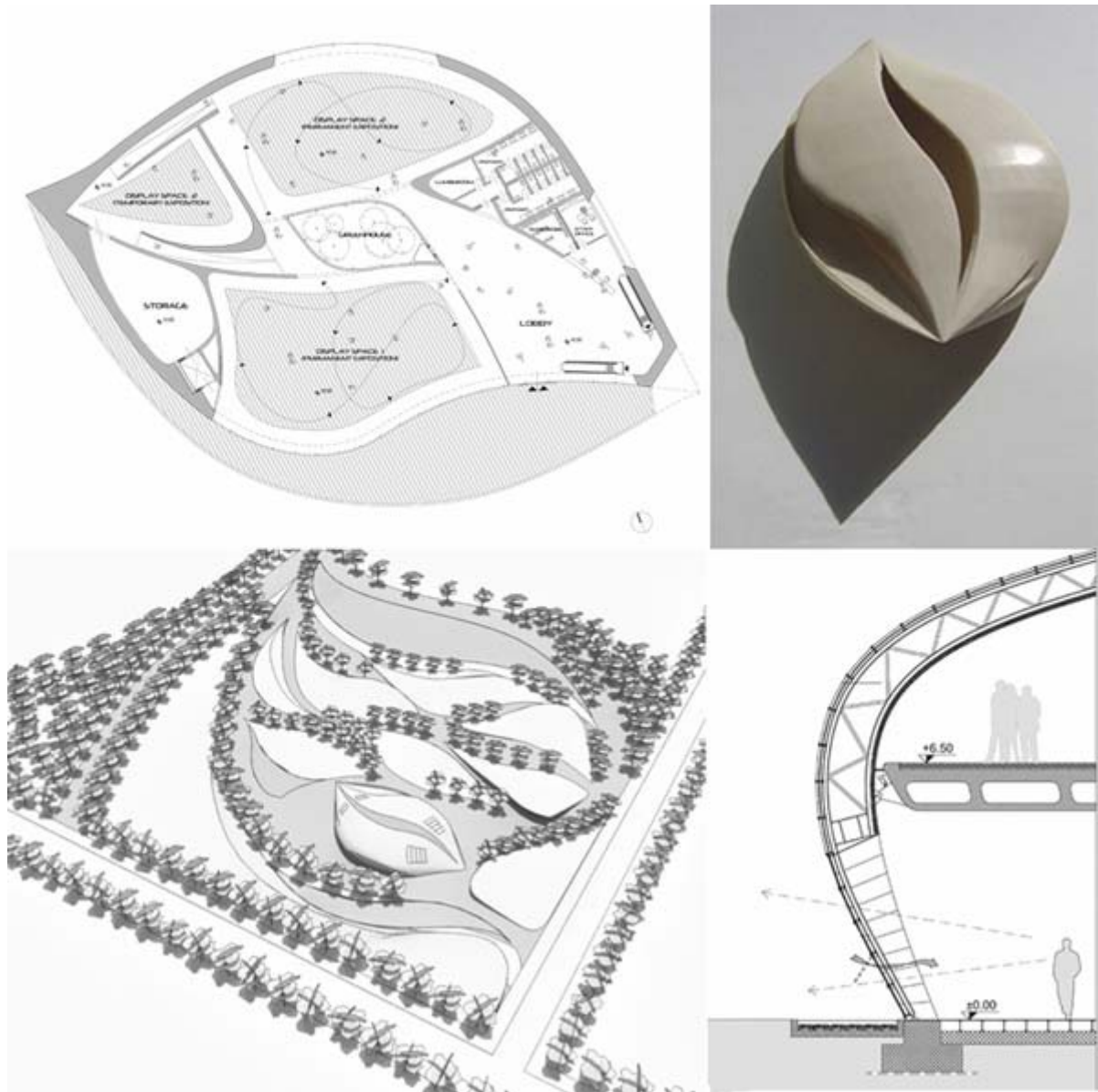
Aerial photo and study of the plan area

The project is the result of a combination of a number of energetic factors and concepts which have been taken into consideration during designing; the study on the performances has been immediately used in the definition of the shape, of the orientation and of the various components. Before we reached the final shape we had to remodel the shape of the building in several steps. Our final decision was taken considering the influence of the western fresh wind and the east-to-west solar path.

The shape of the building has been chosen to fit the surrounding environment and to offer the most comfort to the people inside.

This has been possible with the use of a dynamic real/virtual model of the building.

As it emerges from the various study concepts, the result is that the cover of the building is aerodynamic and fluid both for its shape and its planimetric orientation, so that it creates the best pressure/depression conditions for natural ventilation.



First floor plan, real model, context and section

The building itself is set around a central hall, a sort of glasshouse for the inflow in winter and the outflow in summer of the air for the ventilation of the rooms. The north and south sides are completely made of glass, while the eastern and western sides, being more sensitive to the low sunbeams of morning and afternoon, are mostly opaque.



A centralised control system regulates the openings, according to the information sent by the temperature sensors placed in various points of the building. If necessary a mechanical system can be put into operation.

The flow of the wind has been channeled to a planimetric level creating a “natural funnel” towards the building using elements like, sometimes shielding, the trees and the low vegetation. This effect is strengthened from two hills that, following the course of the vegetation, allow to bring the air inside of the “ailerons” situated on the skin of the museum in order to improve the natural ventilation.

The surface facing south is pervious to the air and is cooled by the western wind. In designing the main glass façade we have taken into consideration the different sun paths at the different times of the year. Its shape is modelled along two different radiuses of curvature cut into the volume of the building. As can be seen in the perspective view, this shape allows the façade to open eastward like a membrane, so that the sunbeams can come in during the morning and to close itself southward, moving the glass surface inwards, with a sort of a screening effect. Furthermore, the southward protrusion of the building creates a screen in summer, while it allows the sunlight to light up the inside in winter, when the sun is lower.

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Video: http://www.youtube.com/watch?v=J1M8_kKls2w