



CALIFORNIA ACADEMY OF SCIENCES

2000 – 2008 San Francisco, USA

The California Academy of Sciences, which was founded in San Francisco in 1853, is one of the most prestigious institutions in the United States and one of the few institutes of natural sciences in which the public experience and the scientific research are carried out at the same location.

In 1999, the California Academy launched a competition by invitation, with three finalist candidates: Richard Rogers, Norman Foster and Renzo Piano.

The Renzo Piano Building Workshop went on to be selected and began designing the new museum in January of the following year.

The site was comprised of 12 different buildings, all of which had been built within Golden Gate Park between 1916 and 1991. The Loma Prieta earthquake, which occurred on October 17th, 1989, had damaged the existing structures so heavily that a radical reconstruction intervention was required. The project involved the demolition of several existing buildings, with the materials being crushed and reutilized for the new structures. For thermal insulation, the project made use of cotton-waste provided by Levi's, while 95% of the steel came from recycled materials.

Three of the old buildings were recovered, partially restored and reconstructed according to their original volumes: the African Hall, the North American (California) Hall and the Steinhart Aquarium.

The primary goal for the reorganization of the new Academy was to expand upon its activities, including the exhibition areas and the research centre, while at the same time identifying innovative solutions to accommodate a greater number of visitors. The building also houses the natural history museum, the aquarium and the planetarium, thus combining the themes of nature, science and civilization.

The new building maintains the same position and orientation as the original Academy: all the functions are laid out around a central square. The dome of the Planetarium and the transparent rain forest Biosphere are adjacent to the square. This connection point between all the museum's main units is covered by a glass "canopy", with a reticular structure reminiscent of a spider web. The structure is open at the centre. The curves of the roof, which express the building's various internal functions, provide for a landscape that integrates perfectly within the surrounding natural environment.

The square's particular features even render it suitable for concerts and other events.

The Academy's mission statement, "*to Explore, Explain, and Protect the Natural World*", rendered this project ideal for the development of environmentally sustainable design strategies.



Material selection, recycling, the positioning of the spaces with respect to the natural lighting, natural ventilation, water usage, rainwater recovery and energy production: all of these design

issues became an integral part of the project itself, and helped the museum obtain LEED “Platinum” certification.

The initial idea was to bring all the spaces together under a single *green roof*, which went on to become the project’s primary symbolic element.

The roof formally unifies the organism: it’s a “living thing” because it’s covered with a thin layer of soil, upon which 1,700,000 specially selected plant species have been planted in 50,000 biodegradable coconut containers. A two-year botanical research project allowed for the species to be selected that would be best capable of surviving in the Golden Gate Park microclimate without the use of artificial fertilizers or irrigation systems.

The vegetation not only serves a decorative purpose, but a functional one as well: the moisture of the soil serves to cool the inside of the museum by 5 or 6 degrees, which has allowed for the use of air conditioning to be avoided for the public areas on the ground floor, as well as for the research offices located along the façade (the only case of its kind throughout the United States).

The wavy line of the roof, which is determined by the shapes of the interior spaces that go beyond the eaves of the roof itself, allows for excess heat to be accumulated and subsequently expelled. These shapes also result in the acceleration of the natural breezes that sustain and reinforce the structure’s natural ventilation.

55.000 photovoltaic cells provide more than 5% of the electricity required by the museum. These are contained between two glass panels, which make up a transparent canopy around the contour of the green roof and shelter visitors from the rain and wind.

The building was inaugurated on September 27th, 2008.