Holcimawards
for sustainable constructior

Regional Holcim Awards competition

Silver 2008 Latin America

Low-energy university mediatheque, Rio de Janeiro, Brazil

Project data

Type of project	Architecture (culture)
Estimated start of construction	January 2009

Main author

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Comment of the Holcim Awards jury Latin America

The *PUC Rio Mediatheque* serves different purposes: it is both the knowledge base of the adjacent university campus but also is open to the public and offers educational programs to the residents in the nearby informal settlement of Favela da Rocinha. The building itself is an attractive landmark demonstrating the high standard of Brazilian architecture and exploring ultimate construction technology. Its concept is driven by passive design elements such as appropriate orientation, heat insulation, shaded windows, natural ventilation and natural lighting which will contribute to a substantial reduction of the energy consumption despite the unusually high requirements regarding the interior climate for book and media preservation.

A further strength lies in the careful integration of the rather voluminous building into the sensitively landscaped surroundings. The project was commended as an excellent example of modern Brazilian architecture responding to the very different needs of academia and the public, and was created by a multidisciplinary team effort based on a sound strategy for passive thermal control.

Project description by author

The situation of the Pontifícia Universidade Católica do Rio de Janeiro *(PUC-Rio) Mediatheque* project takes into account the "two existing ground levels" as a proper arrangement for its dual program: 1) Book collection and administrative offices as the support building placed on lower ground level (0m); and 2) Plaza providing access to the *Mediatheque* public building at upper-ground level (4m).

The roof of the support building is a reflecting pool. The plaza above is a natural extension of the existing pilotis (pier-supported) area, the most important meeting point on campus. The water is poured onto the slab as soon as it is cast in order to make it impermeable and free of any asphaltic membrane or other chemical product. The water also provides effective thermal insulation.

The book collection shelves are displayed inside a glass enclosed area that forms a rectangular core surrounded by office spaces. The configuration ensures that offices are always close to the windows and shelves and reduces the energy consumption for temperature and humidity control required by protecting the book collection from the outside by a double layer of single glass.

Visitors access the building foyer from the plaza by a half-level up-ramp. Although the plaza is placed on the upper ground level, it is also linked to the lower ground level by a ramp and stairs. The plaza interconnects the two different ground levels and also several paths in the area.

The main reading room is open to south and north, both properly shaded by sun sails. In order to prevent heating and direct sunlight, the longitudinal façades have no windows. There is a void, like a piece of outside space enclosed inside the building that works as a "natural lamp" where it is far from the windows. Besides, two sections of glass floor, on the level above, allow natural light from the clerestory pass through.

The researchers' and UNESCO floor was specifically conceived to support both activities. The foyer, main reading room and researchers' floor offer multiples spaces for visitors. The building structure is made by a pair of trusses that each rest on two columns. The longitudinal façades are externally closed by a 5mm-thick steel boards with continuously welded joins. These façades more than protect from weather, they shadow the internal wall. Actually, the façades are composed by several layers: steel, air barrier, thermal insulating, mechanical space and acoustic panel. The most important advantage of this solution is that it allows us to balance the thermo-acoustic performance of the building according to the results from 3D model tests by using advanced computer tools in order to reach an environmental performance according to the internationally agreed standards.

Relevance to target issues by author

Quantum change and transferability

High quality and innovative architecture, by considering the Brazilian modern tradition and exploring ultimate construction technology. BIM (building information model) for architectural design development, coordinating all the designers team engaged in the project, checking performance with 3D models and also for providing records to future maintenance of the building.
Architectural proposal manages the results from several consultants and designers in each specific knowledge field in order to share solutions between two or more fields of expertise: e.g. water on the support building roof was incorporated by the landscape designer; for thermal control; to provide water for fire control system and, finally, to ensure the impermeability of the concrete slab.

Ethical standards and social equity

The design was selected in a competition organized by the PUC-Rio School of Architecture, the jury decided after having studied the proposals and also after a public presentation of each one of the architectural teams. The process and its result were widely publicized through the world media. The access to the *Mediatheque* is NOT restricted to the university, it is open and free for everyone. Its social impact is enhanced due to its location on the Marques de São Vicente St, the main entrance to "favela da rocinha". Stimulate education; access to multimedia information is probably the most impacting social action in Brazil.

Ecological quality and energy conservation

Design avoids import/export of soil. Replacement of an outside parking area by recovering a green area. Reflecting pool, façade system and nightly natural ventilation as strategies for passive control of thermal performance. Low energy air conditioning system, will be completely turned off over four months per year. High level of natural light inside combined with low energy lamps.

Economic performance and compatibility

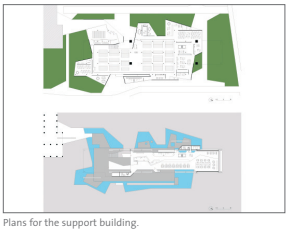
NGO management for fund-raising program and budget administration. Paid by donors through tax bonus federal program considering project approved in the Ministry of Culture. Approach provides a way to submit the project to society and also engage people in the process. The sustainability standards of the building ensure low ongoing maintenance costs to PUC-Rio.

Contextual and aesthetic impact

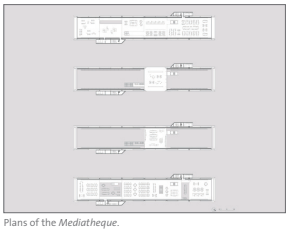
Footprint of the support building preserve existing trees. Reduced impact on surrounding building by retained and recovered trees. Provides visibility to the *Mediatheque* as a way to give it identity as institution and also to stimulate reading and multimedia information access. Promotes a cultural building as a land mark for the city of Rio de Janeiro.

Illustrating the positioning of the *Mediatheque* on the PUC-Rio campus.

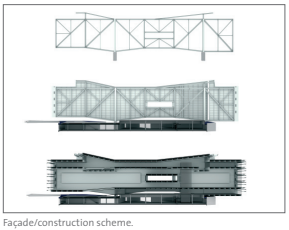
Eastern façade of the *PUC-Rio Mediatheque*.



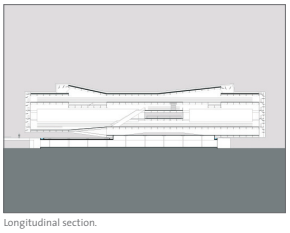
Plans for the support building.



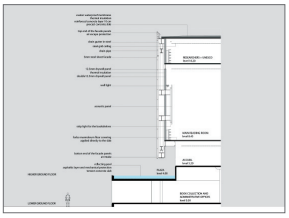
Plans of the *Mediatheque*.



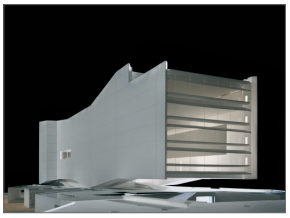
Façade/construction scheme.



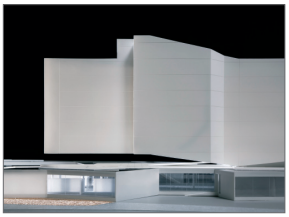
Longitudinal section.



Construction section.



View of the main entrance foyer.



Detail of the 30m cantilever.

Interior view.