Energy-efficient medical and social center, São Paulo, Brazil

Project data
Type of project: Architecture (institutional)
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Comment of the Holcim Awards jury Latin America
The Enkyo medical and social center located in the Asian Quarter of Liberdade close to downtown São Paulo will be thoroughly computer-simulated with regard to its surrounding urban context for observations of aerodynamics, thermal behavior and natural lightning. This is a pilot project for computer-simulation in Brazil. Based on sound analyses, all traced strategies were meant to be economical and simple rather than high-tech in order to keep life cycle costs low.

As a result many passive measures were integrated into the design such as an optimal building orientation and shading elements on the façades without affecting high daylight penetration. Geothermal pre-cooling as an entirely new strategy for the subtropical region of Brazil was developed, bringing naturally available groundwater as cooling fluid to standard fan-coil units of conventional air conditioning systems. In addition rocks of the rainwater will be collected for non-potable use, also improving storm water management. The jury has commended this project because it has the potential to become a benchmark with regard to energy efficiency, geothermal pre-cooling and rainwater harvesting in the urban context of Brazil.

Project description by author
This entirely new building for the Enkyo medical and social center (Enkyo) in the Asian Quarter of Liberdade, São Paulo will accommodate the much needed expansion of the 50-year old institution that began by providing medical services to the Japanese community in Brazil. Enkyo is not only recommended for its medical services but also for its social services. Thus, the new building design reflects the different but complementary activities by adopting the strategy of vertical zoning, providing separate entrances and elevator cores for each of the medical center and the community center. Although utilized by Brazilians in general, many clients of Enkyo are from Japanese backgrounds. Thus, a certain traditional Japanese symbolism has been induced in this contemporary (and energy-efficient) project, e.g., a bridge spanning above a garden (from the sidewalk to the main entrance), a pre-shading and solar panel, and perhaps most importantly, the culture of shoji (traditional Japanese shading device in wood or paper) here reinterpreted as perforated metal screen in all façades.

From the outset, the project enlisted several strategies for optimum energy-efficiency that can be considered innovative in Brazil. However, with one year of project development, many of the strategies have been reconsidered, either by economic forces, client needs, site conditions, or were found inefficient for this particular project after further simulations. In this sense, we are proud to present an advanced project fitting for the Brazilian socio-economic and environmental context that may be informative to other professionals.

Quantum change and transferability
Few contemporary projects in Brazil have had the opportunity to be thoroughly computer-simulated in regard to the surrounding urban context for observations of aerodynamics, thermal properties and lighting comfort. With this set of analysis, all traced strategies were meant to be economical and simple (passive and low-tech) rather than advanced technological breakthroughs, in order to keep installation, operation and maintenance costs low. The increased level of energy efficiency compared to conventional buildings is estimated to be around 80%. Natural resources such as rainwater and groundwater will be used nearly 100%, improving storm water management. The expectations are that our experiences can be transferred (in full or adapted) to other projects in any region worldwide with similar climate.

Ethical standards and social equity
Although serving Brazilians in general, Enkyo’s core users are elderly people with a Japanese background. Since many can not speak Portuguese, Enkyo offers opportunities to cultivate friendships and uphold traditions/identities but is also open to share these values with communities from other backgrounds. This philosophy is particularly evident since 50% of the new building will be devoted to social services.

Ecological quality and energy conservation
Geothermal pre-cooling is an entirely new strategy for the subtropical region of Brazil. We have developed an integrated system that brings available groundwater as cooling fluid to standard fan-coil units of conventional air-conditioning systems. The adaptation of readily available equipment is proving highly economical and will utilize the excess of groundwater that otherwise would have to be continuously pumped out of the site. The building pre-shading is an important strategy adopted in order to decrease thermal loads and at the same time to optimize natural daylight conditions avoiding glare. Using perforated metal screen façades, we estimate that about 80% of the energy that would go into cooling and lighting equipment can be saved.

Economic performance and compatibility
Working in Brazil and with a non-profit client, we have been very aware of every economic cost. All initially proposed strategies were simulated and analyzed both in terms of performance benefits, as well as implementation, operation and maintenance costs. Cost/benefit comparisons among different alternatives were presented to the client, who was then able to participate and understand the process.

Contextual and aesthetic impact
Although frequently visited by tourists and Asian families in São Paulo, the district of Liberdade adjacent to the downtown area is one of the most deteriorated precincts of the city. A completely new and somewhat sophisticated building, providing important medical and social services for the local community and beyond, will certainly benefit the surroundings.