High-Tech Low-Tech
Sustainable research center featuring traditional woodworking methods, Kyoto, Japan

Summary and appraisal by the jury

The French School of Asian Studies – École Francaise d’Extrême-Orient (EFEO) – holds an extensive library housed in a new building in Kyoto. The narrow site is surrounded by neighboring buildings on three sides. Equipped with the most advanced technological features (electrochromic glass, ecological glass-wool insulation; geothermal heat storage, solar panels, etc.), the structure offers a prime example of sustainable development in modern construction. At the same time, time-honored Japanese woodworking methods were deployed, allowing the building to be erected rapidly.

The jury considers the project to be an ideal example of how to combine high-tech and low-tech construction in contemporary building practice. The structure – a manifesto in its own right – merges modern state-of-the-art technology with traditional artisanship. Bringing the “old” and the “new” together requires a specific sensibility, one based on an understanding of architecture as a form of research. While looking at history, future solutions are sought, as an approach adhering to the fundamental mandate of the institution as a research center.

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Acknowledgement

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Project data
Context: Architecture, building and civil engineering
Client: École Francaise d’Extrême-Orient (EFEO)
Background: Private commission
Planned start: July 2013

Sustainability concept

Japanese wooden carpentry – Traditional construction. While most of Japanese architectural practices prefer using concrete and steel structures for the construction of office buildings, one of the challenges of this project is to contract a local construction company, a local carpenter and to use a standard traditional short-span (1.8 m) wooden structure. Checked by a mechanical engineer, this structure is responding to the same anti-seismic requirements as other structures.

Living room: an economical, ecological and ethical statement. All building materials and wood are ecologic (Japanese Agricultural Standard), most of the wood comes from sustainable local forests. The wooden furniture (bookshelves, tables and desks) are designed by the architect and built by a local artisan.

Transferring ecological technologies – Visible innovation. Located in an urban environment and on a narrow site surrounded on three sides by other constructions, the main façade is oriented to the west which is the most exposed to afternoon sunlight. This issue has been discussed with the group Saint-Gobain who decided to experiment on this building using a new technology for the first time in Asia. Trailing for more than ten years in the USA, Sage electrochromic glass allows a sunlight reduction between 60% (clear position) and 98% (darker). This is the first use of electrochromic glass in Japan. The glazed façade is mounted by the Japanese carpenters on a wooden curtain-wall, thus showing the adaptation of a new technology by local technicians.

New economic/ecological system. In Japan, most of constructions do not have thermal insulation, and rely mostly on mechanical air conditioning. Since March 2011, the population of Japan is more aware of the need to reduce the consumption of electric power, and new insulation materials start to be used. This project introduces a new ecological glass wool (Maglon layer) made in Japan. The electric power of the building is supplied by solar panels that cover the southern side of the roof. The air conditioning of the building is provided by a “cool tube” system – outside air passes into a tube buried in the ground so that the air injected into the building is always at a geothermal temperature (10-15°C). Standard electric floor heating and air conditioning, a system popular in Japan, is supplied by solar panels that cover the southern side of the roof. The air conditioning of the building is provided by a “cool tube” system – outside air passes into a tube buried in the ground so that the air injected into the building is always at a geothermal temperature (10-15°C). Standard electric floor heating and air conditioning, a system popular in Japan, is supplied by solar panels that cover the southern side of the roof.

The wooden curtain-wall is composed by electrochromic glasses, and the appearance of the façade changes according to weather conditions. The space behind the façade is a buffer zone. This space is a place of passage, or promenade inside the building, with an open stairway connected to the library. Each step is like an extension of the bookshelf as movement was supported by light. This is a contemporary building rooted in Japanese architecture (reflection and transparency).

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