WOOD AS A CORE STRATEGY TO WIN AN ARCHITECTURAL COMPETITION

Normand Hudon¹, César Herrera², François Cantin³, Mathieu Castonguay⁴

ABSTRACT: The Glaxo Smith Kline Building in Quebec City was built to support the administrative and maintenance activities of the influenza vaccines plant. In 2009, the international company invited four architectural firms to participate in a competition. The brief was to design a highly distinctive building that would also be exemplary in energy efficiency. Coarchitecture’s proposal won based on value innovation aimed at sustainable development targets. The main driver that gave the building its uniqueness was to showcase a wood structure by integrating all the systems accordingly.

1 DESIGN INSIDE OUT WITH A BIOPHILIC APPROACH

The building site had poor soil quality and was practically void of vegetation. The site planning and landscaping approach was to restore it to an indigenous natural state. Promoting biodiversity and the replenishment of groundwater to ensure the growth of the native plants that were reintroduced, the finished landscape contributes not only to the quality of the interior spaces but to the reenergizing of the occupants as well, all in coherence with the presence of wood as a natural material.

Similarly, the building with its organic silhouette has been placed here in symbiosis with the climate, much like an animal ingeniously adapted to its environment as a matter of survival. It faces the south, protected aesthetically from solar heat gains by a system of sunshades integrated into a fully-glazed, double-skinned envelope with translucent metal panels on the east and west sides. On the north side, the building envelope is designed to conserve energy in the cold of winter. These techniques have been employed to provide comfortable, indoor environments lit abundantly by natural light which, their occupants have reported, has an invigorating effect.

An important objective with the fully glazed double skin façade was to expose the wood structure to the street and highway views. Again, the wood brings a highly remarkable contribution to the building aesthetics without being exposed to the elements. Coarchitecture believes this is the right way to maximize wood use in high end buildings to avoid maintenance issues and insure long term performance at low cost.

The unanimous satisfaction expressed by the occupants of the building translates into increases in creativity, productivity and benefits for the company. The success of this project, therefore, has the potential to change attitudes in a way that the administrative sector can better contribute

¹ Normand Hudon, Senior partner, nhudon@coarchitecture.com
² César Herrera, Senior partner, cherrera@coarchitecture.com
³ François Cantin, architect, fcantin@coarchitecture.com
⁴ Mathieu Castonguay, engineer, mcastonguay@coarchitecture.com
Coarchitecture, 1175 Lavigerie ave, Quebec, Canada.
to the quality of the urban landscape, and especially, towards sustainable development.

The 4 000 sq.m. 3 storey building rectangular in shape of 62 metres long and 22 metres wide. It is oriented on an east-west axis so that its longest facade faces south. This southern facade has a fully glazed, double-skinned envelope that has a system capable of regulating the interior temperature according to the season.

The structure is made entirely of glued-laminated timber with a mill run deck and circular columns of variable diameter for the main spaces. The envelope is composed mostly of curtain walls but on the north side, the exterior cladding is made up of aluminum panels in a drained cavity wall system to increase thermal performance.

In front of the east and west facades, perforated metal screens act as shades that filter the rays of the sun while still allowing clear views of the exterior.

A geothermal energy system combined with radiant floor heating and chill beams heats and cools the building. The air exchange is made through a patent Swedish air-to-air heat recovery ventilation system which is starting to demonstrate its effectiveness in Canada.

2 GSK AND SUSTAINABLE DEVELOPMENT

The administrative building of the GlaxoSmithKline Biologics pharmaceutical company is located in the Quebec Metro High Tech Park in Quebec City. The rectangular-shaped building has a surface area of 3,645 m² on two floors.

The key strategies for sustainable design were the following:
- The orientation of the building, including two long facades, one facing south and the other facing north.
- The use of a structure made entirely of wood.
- The use of geothermal energy as the sole system of heating and air conditioning, through the use of radiant floor heating and chilled beams.
- The use of natural ventilation for the interactive public spaces.
- The revitalisation of the site by recreating the original ecosystems of the area.
- The rounded form of the building to create an effect of lift and to encourage natural ventilation.
- The use of an active, double-skinned envelope on the southern facade of the building.

DISTINCTIONS

2013 Winner of the prestigious Award of Excellence from the Royal Architectural Institute of Canada (RAIC) in the category "Innovation in Architecture";
Winner of the prestigious Award of Excellence from the College of Architects in the category "Commercial Buildings" with the mention "Sustainable Development";
Winner of two awards for excellence in Cecobois the following categories "Concept structural" and "Sustainable Development";
LEED-NC Gold certification.

2012 Winner of the Special Jury Prize to "Merits architecture Quebec City";
Laureate sustainable development Fidéides;
Nobel Prize "for excellence in real estate" UDI;

2011 Winner of "Innovation and Sustainable Development" Contech.

ACKNOWLEDGEMENT

Credits for the Administrative Building of Glaxo Smith Kline
Architects: Coarchitecture
Location: Quebec city, Quebec, Canada
Program: Administrative building for a biotechnology enterprise
Project Area: 37 000sqm
Project Year: 2011
Client: Glaxo Smith Kline
Photographs: Stéphane Groleau, Agence PURE

Consultants:
Landscape architect : François Courville architecte paysagiste
Structural Engineers : SDK et associés
Mechanical Engineers : Pageau Morel et associés inc.
Civil Engineers: Marchand Houle
Construction manager: Verreault