SUSTAINABLE PERSPECTIVE

# Stunning Example of a Green Building:

## La Tohu Pavilion – Cirque du Soleil

*In an era of sustainable development, energy efficiency ranks high on the list of fundamental construction criteria. In addition to selecting durable materials whose production respects environmental values, the parties involved must also seek the best ways of reducing the building's energy consumption.*

Located in the Circus Arts district, the new La Tohu pavilion is a stunning example of such a structure. Consisting of Schème Consultants, architect Jacques Plante and the firm of Jodoin, Lamarre, Pratte & Associates, the consortium of architects retained for the execution of this project landed this contract in 2002, following a province-wide competition which involved a main selection criteria of a "green building."

"Energy efficiency is highly important since the new pavilion is located at the entrance to the Saint-Michel Environmental Complex, site of the former Miron quarry, where the City of Montréal plans to build a park over the coming years," explains Marc Blouin, architect with Shème Consultants. "In addition, the mission of La Tohu, a non-profit organization founded at the instigation of the Cirque du Soleil, among others, not only consists in producing shows and holding cultural activities, but surprising as it may seem, it also involves the promotion of architecture and sustainable development."

**Acrobatics Of Design**

Built between June 2003 and August 2004, the new La Tohu pavilion houses a concert hall with a capacity of 840 persons, along with a circus museum and an exhibition hall. Its design incorporates every measure to ensure the building's energy efficiency.



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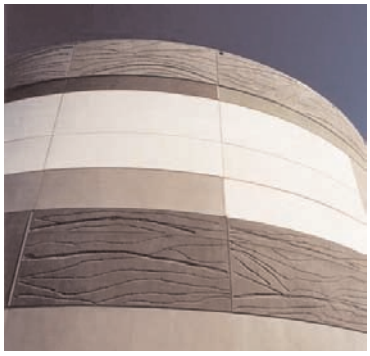
In this regard, the architects and mechanical engineer, Martin Roy, displayed ingenuity in the selection of the construction site. In fact, they proposed putting the building up less than 100 metres from the Gazmont gas power plant, in order to benefit from biogases generated by the millions of tons of decomposing refuse buried in this location when it was a landfill site.

"Biogases are converted in the power plant to produce electricity, which is then resold to Hydro-Quebec," explains Blouin. "The water used to cool the turbines is recovered while it is still hot and rather than being channelled to the sewers, it is forwarded to the pavilion where it runs through a network of coiled pipes, providing heating for the floor. This makes it possible to cut heating costs considerably."

The pavilion also taps into solar energy with mechanical ventilation equipment powered by the natural movement of air heated by the rays of the sun, in what is known as the "stack effect," further contributing to lower heating costs. In addition, a wall equipped with solar collector panels will soon be built on the southern part of the building, providing passive heating of the concrete panels covering the concert hall."

The building's ventilation and air conditioning systems, among other systems, are also being powered by a geothermal system twinned with a huge bin of ice. During the summer, the air is cooled by the ice then regenerated using a small compressor that requires much less energy than a conventional air conditioning unit.



Reducing energy consumption also involves outdoor lighting. This facility uses a system of light-emitting diode (LED) bulbs that consume much less energy than traditional lighting systems.

**Targeting LEED Gold Certification**

"There is nothing revolutionary about the means we used to maximize the building's energy efficiency," notes the architect. "What is special is that we incorporated virtually every one of them of them in a single building."

Durability, savings on resources and raw materials, energy efficiency, environmental quality and the rational use

of water: the pavilion meets all the requirements for gold certification from the Canadian Green Building Council's Leadership in Energy and Environmental Design (LEED). Steps have already been taken to obtain this noteworthy certification.

An example that should be emulated, this project demonstrates without a doubt that we have everything to gain from adopting a creative approach to the optimization of our buildings' energy efficiency.

**A Crafting Challenge For Saramac**
Saramac, a Lachenaie company specializing in the prefabrication of non-prestressed architectural and structural elements, produced the concrete architectural panels that cover the outside of La Tohu's concert hall. These custom-designed panels were manufactured using standard type 30 concrete with a compressive strength of 35 MPa.

"We had to innovate and essentially work as artisans to make the architect's vision a reality," notes Caroline Alain, project manager at Saramac. "We crafted a shell patterned with tree branches, stones and sand. We then inserted it into the mould we normally use to create the motifs that would appear on the surface of the panels."

**Textures Rich In Symbolism**
After weeks of work and a host of tests, the experts at Saramac met the challenge, producing the textures and motifs the architect had envisioned.

The result is impressive. Not only are these panels evocative of the former quarry's geological strata, they also recall wood, canvas and stone, materials from which the circuses of old made their tents.

"Precast concrete was selected because it fully met the requirements of the LEED program," states Alain. "Durable, fireproof and recyclable, this material helps obtain superior energy efficiency. It makes it possible to obtain flawless soundproofing, an important feature, particularly in the case of a concert hall such as the one in the new pavilion."

**CREDITS:**

**Client:** La Tohu, Cité des arts du cirque

**Architectural Consortium:** Schème consultants, architect Jacques Plante and Jodoin, Lamarre, Pratte & Associates

**Structural Engineer:** Martoni-Cyr & Associates

**Mechanical and Electrical Engineer:** Martin Roy & Associates

**Architectural Precast Concrete:** Saramac Inc.