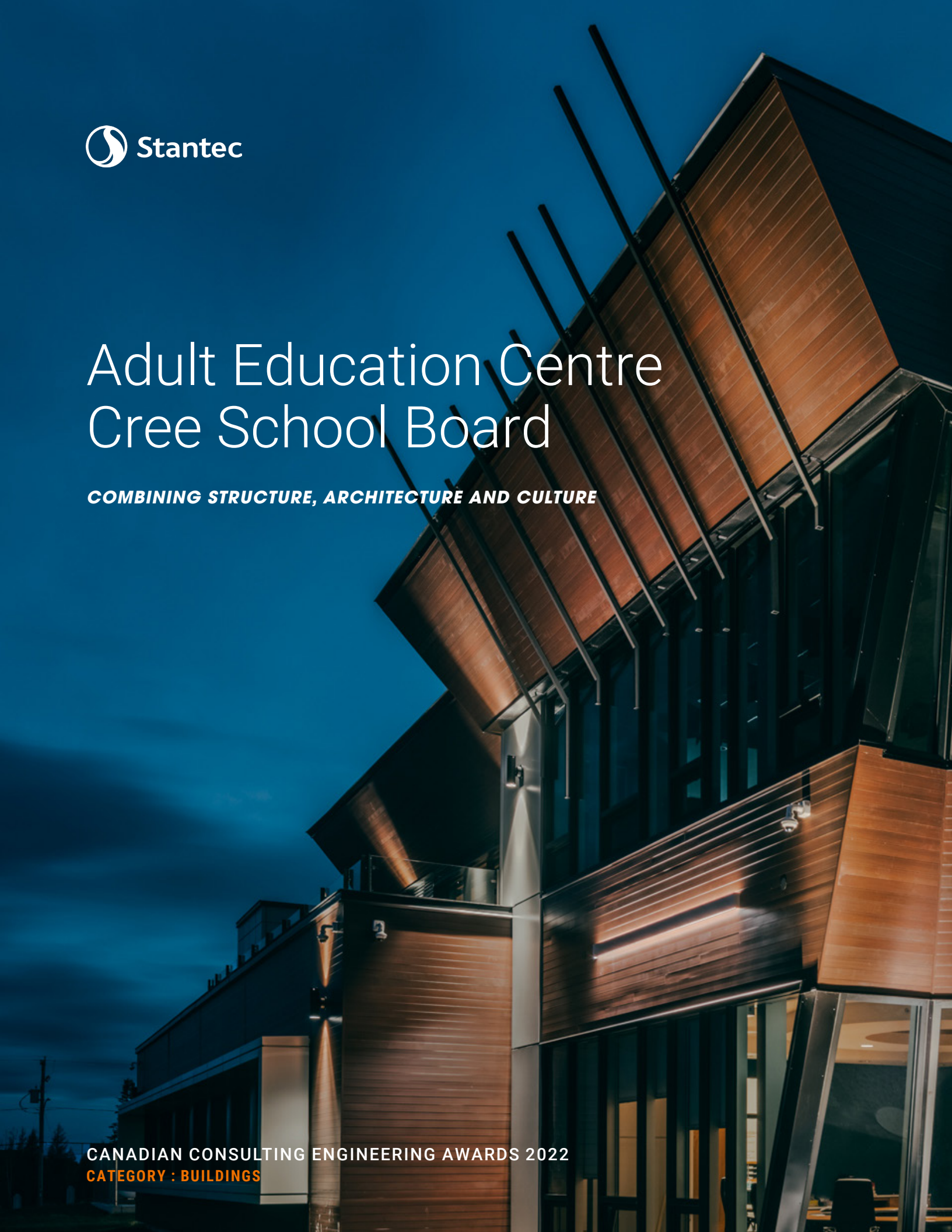

Stantec

Adult Education Centre
Cree School Board

COMBINING STRUCTURE, ARCHITECTURE AND CULTURE

CANADIAN CONSULTING ENGINEERING AWARDS 2022

CATEGORY : BUILDINGS

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Mistissini

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Architects :
Éric Painchaud architecte et associés

INNOVATION

Until 2021, students of the adult education centre in Mistissini in northern Quebec were using space in the municipality's high school, as there was no dedicated location for adults. The selection of courses available to the community was therefore quite limited.

To meet the needs of the Cree Nation of Eeyou Istchee, the Cree School Board decided to invest in the construction of a multi-purpose building specifically for postsecondary education. With an area of 3,053 m^2, the two-storey building has two large industrial workshops (with a bridge crane, jib cranes, dust collection system and gas utilities), a small kitchen, classrooms, a laboratory, a spacious meeting room and an architecturally styled atrium.

Providing mechanical, electrical, structural, civil and energy efficiency expertise, our team achieved a unique building that honours the Cree heritage while adopting the innovative BIM design approach.

INNOVATION WITH RESPECT FOR TRADITION

In keeping with Indigenous tradition, the main building façade faces east toward the rising sun, which also allows the structure to benefit from maximum natural light.

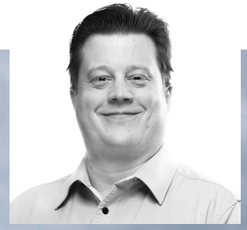
In the shape of an arrowhead, the majestic structure features one end with sloping windows, a major structural challenge, and an arcing roof line that follows the line of a spruce teepee erected outside. In this space, light and warmth from the sun bathe the meeting room and provide a spectacular view of Lake Mistissini. The two-storey entrance atrium has a hearth and is supported by wood columns evocative of a teepee.

To give the building the desired position and orientation, overburden excavation was necessary to remove contaminated soil that was unfit for construction and compensate for the incline of the land. Construction of a significant embankment made it possible to improve the poor bearing capacity of the soil and ensure structural strength.

Lastly, due to the irregular geometry of the building and its multiple uses, we divided the structural design into three sections, i.e. the workshops, the classrooms and the atrium, in order to better address the specific features of each section. This ingenious approach allowed us to avoid structural irregularities and manage lateral stresses, use a mix of different materials (glue-laminated wood, concrete and steel) and provide greater wind and seismic protection for each of the three sections.

Other project innovations:

Modern and complete systems for remote-controlled monitoring, access control and building lighting



It's as though we had to combine the three little pigs' different houses, each with its own challenges in terms of geometry, structure, foundation and architectural design, in order to make a single integrated and user-friendly building."timent intégré et convivial.

DAVID DUBÉ, P.Eng.
Project Manager, Stantec

COMPLEXITY

NORTHERN SETTING

Due to the climate, the underground water utilities had to be installed at a depth of 2.4 metres (compared to 1.8 metres in Montreal). A heating system was added to prevent pipe freezing, which meant building a deeper foundation.

Given the uncertainty of the community's power supply, we included an emergency back-up generator system that will meet a good proportion of the building's energy needs. This involved building a concrete footing and additional foundations to accommodate the generator.

With the community so vulnerable to the pandemic, the region went into lockdown several times, preventing us from accessing the construction site for long periods of time. We made use of virtual technologies such as site visits by drone and videoconferencing to carry out many of the site inspections and meetings with the client and contractor. The brief construction window from late May to mid-August made the exterior civil engineering and structural work more complex.

WORKSHOP CHALLENGES

A number of features ensure the safety and long life of the workshops:

. Materials (steel and concrete) to increase fire resistance, soundproofing and durability;
. Ultra high-performance dust collection, ventilation and fire safety systems;
. An industrial-grade steel frame to support the bridge crane, jib cranes and lifting equipment;
. Flooring resistant to various loads.

BIM 2

PROJECT DESIGNED USING AN INTEGRATED 3D MODELLING APPROACH

SOCIAL AND ECONOMIC BENEFITS

Photo credit : Cree School Board

With a broader and more diverse course offering, the new education centre allows the young adults of Eeyou Istchee to build and improve their knowledge in areas that are in demand in the community, such as welding, carpentry, automotive mechanics, healthcare, environment, forestry and administration. In addition, specialized training programs will need to be developed and expanded in the coming years to address the demographics of the Cree population and the needs of regional businesses.

Developing a skilled local labour force is critical to the community's prosperity and will help it meet its own needs without the need to go outside the region for services. Education and training for the Mistissini community will contribute directly to diversifying the local economy.

The centre also provides support services, giving students access to critical resources for success in all aspects of their lives, such as mentoring, wellness, career planning, anxiety management, exam preparation and motivation services.

Finally, the centre construction generated numerous jobs in the community: Cree workers made up approximately 50% of the project work force. Many labourers, formworkers, heavy truck drivers, steelworkers, welders and carpenters were recruited from the region as well as Saguenay–Lac-St-Jean to help with the centre construction.

$15.75M
OVERALL PROJECT COST

50%
PROPORTION OF CREE LABOUR ON THE PROJECT

This is a signature project for a community that really needed it. The education centre is one of the most beautiful buildings in Mistissini and the project generated quality jobs for the region.

DAVID DUBÉ, P.Eng.
Project Manager, Stantec

ENVIRONMENTAL BENEFITS

THE SEVENTH GENERATION PRINCIPLE

Canada's First Nations, like other Indigenous peoples around the world, observe the seventh generation principle, which means considering the long-term effects of an action by trying to assess the consequences for the next seven generations. Therefore, long before sustainable development became a trend, the First Nations were concerned with living in harmony with their environment and using resources responsibly. That's why durable, environmentally friendly and local materials like wood were chosen for many of the building's structural and architectural features (entryway, roof, atrium beams and columns).

RECLAIMING LAND

Since the site was unsuitable for construction, major work to decontaminate the area was necessary before the first shovel hit the ground. We thus completely revitalized a sector that had been abandoned for a number of years.

REDUCING THE CARBON FOOTPRINT

We carried out an energy efficiency study to enable us to propose highly efficient energy saving measures. The main ventilation and heating systems have heat recovery cores, which cut energy consumption nearly in half. An efficient control system also makes it possible to reduce temperatures when rooms are not in use.

STORMWATER MANAGEMENT

We installed an underground system of stormwater catchment chambers to prevent overloading the community's storm sewer system during periods of heavy rain.

250m^3
DECONTAMINATED SOIL

MEETING CLIENT'S NEEDS

Photo credit : Cree School Board

We've created a useful building that will allow young adults to develop in all aspects of their lives. And as project manager, that's my biggest source of pride.

TAOUFIK ATMANI
Cree School Board

A genuine source of pride for the Mistissini population, the new education centre honours the rich heritage of the Cree community. Indigenous culture and customs are woven into the smallest details of the building: use of wood, orientation towards the rising sun, arrowhead shape, teepee-shaped structures, an Elders' room where age-old traditions can be passed on, works by local artists and light fixtures that evoke Canada geese in flight. The seamless integration of the building with its environment facilitated the local community's buy-in to the project.

"This is not only a modern new facility, but a genuinely positive learning community for students. It is an environment in which students feel supported in their education and all aspects of their lives," says Nian Matoush, adult education director for the Cree School Board.

The Cree School Board has ambitious goals for the new centre. It built its programming on a rigorous data collection process to identify the real needs of the community members. Thus, thanks to the flexible classrooms and multi-use workshops, the course selection can be expanded in the coming years according to community demand and needs.

We are proud and honoured to have had the opportunity to design this new vocational training centre, which officially opened on October 28, 2021. Carried out by our Chicoutimi office, the project reflects a strong partnership with the Cree communities that goes back over 40 years.

APPENDIX

ABOUT STANTEC

Founded in Canada in 1954, Stantec is a global design firm that unites approximately 25,000 employees working in over 400 locations across 6 continents. Stantec is now one of the top three design firms in North America.

In Quebec, Stantec is active in the buildings, telecommunications, water, power, earth sciences and natural resources, transportation, and community development fields. Our team offers services in engineering, urban planning, landscape architecture, environmental services, and project management. We're 1,500 engineers, professionals, designers, project managers, and technicians carrying out projects together—from design, through construction site management, to commissioning.

We are at our best when we're innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the current and future quality of life in communities nearby and across the globe.

At our 15 offices across the province, we stay close to our clients and regions so we can design with community in mind.

Design with community in mind.
The Stantec Promise

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