CENTENNIAL COLLEGE: A-BUILDING EXPANSION

LEED Gold, net-zero carbon, and WELL certifications signify huge commitment to sustainability

By Craig Applegath

Established in 1966, Centennial College of Applied Arts & Technology is the oldest publicly funded college in Ontario. A-Building is situated on the Progress Campus in Scarborough, about 25km east of Downtown Toronto.

The city of Toronto is located on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many different First Nations, Inuit and Métis peoples. This contributes to the cultural diversity of Centennial College; whose faculty and students speak more than 80 different languages.

1. The cladding combines parallelogram and trapezoidal shingled aluminum wall panels in combination with composite wood veneer wall panels and triple-glazed aluminum-framed curtain wall.

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CONTEXT AND CONCEPT

Centennial College envisioned its A Building Expansion as a living embodiment of Chief R.
Stacey Laforme's inspirational book Living in the Tall Grass: Poems of Reconciliation. The design response to this challenge is a celebration of the Mi'kmaq concept of "Two-Eyed Seeing" which harmonizes Indigenous wisdom and Western perspectives.

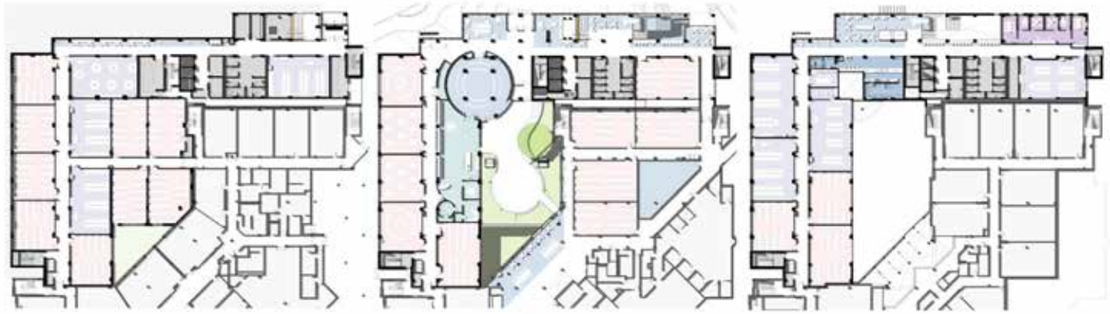
The A-Building Expansion, which houses the School of Engineering Technology and Applied Science programs completes the truncated corner of the site, forming a gateway into the campus. A new urban edge & landscaped area planted with biologically indigenous plant species enhances the public realm.
The prominent north & west facades act as a tool for storytelling, visually symbolizing the aspirations of the institution. Designed to embody the Indigenous concepts of the four-colour medicine wheel and the seven directions, the building also visually signals the coming together of Indigenous and Western aesthetics.

PROGRAM

The A Building Expansion sits lightly on the land, and is aligned with the four cardinal directions. The main entrance opens to the East, echoing the traditional approach of a longhouse. In this six storey structure, the lower three floors contain flexible and accessible classrooms, labs, informal learning spaces and food services; while the upper three floors contain flexible workspaces for Faculty and Staff specifically planned for collaboration and student engagement. The building also surrounds an exterior courtyard that serves as an outdoor classroom for teaching in the round. Designed for inclusivity, the facility also incorporates universal Washrooms, lactation rooms, and a multi-faith space to meet the needs of all occupants.

STRUCTURE, FORM AND MATERIALS

The ground floor structure is cast-in-place concrete, above which are five storeys of glulam post and beam construction, with CLT floor panels with concrete topping. Much of the mass timber structure is left exposed.

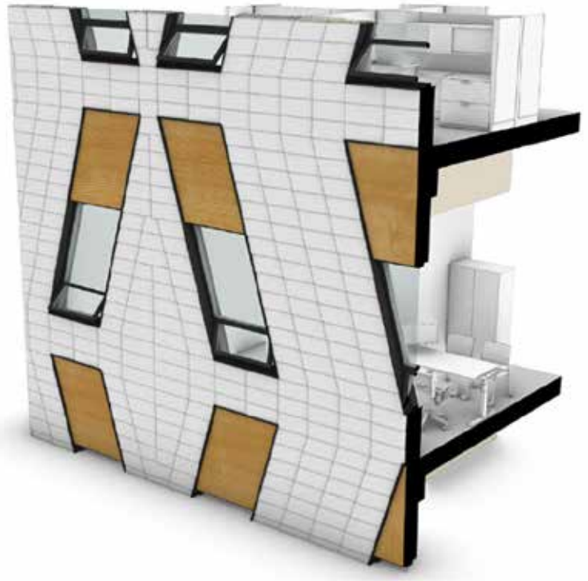


Level one | Level two | Level three

Floor plans

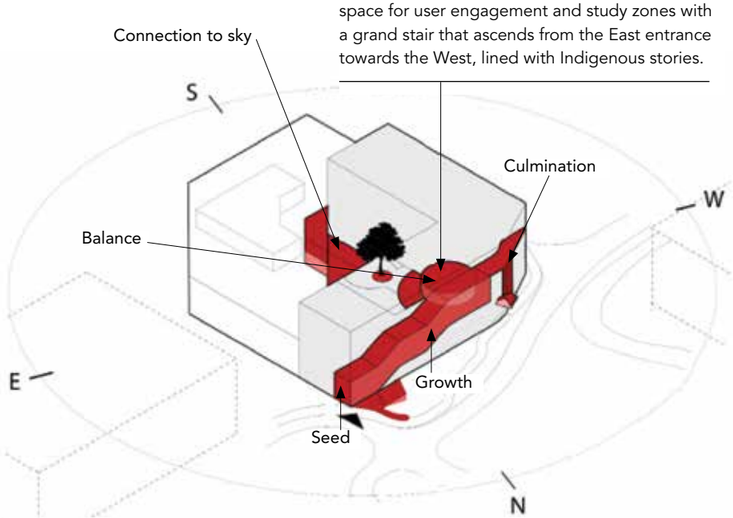
Site plan & interior principles

1. Sloped landscaped area with Indigenous planting
2. Seven Columns representing the seven Mishomis teachings
3. East entry Plaza
4. Bicycle parking.
5. Existing internal student highway.
6. Interior Courtyard at level 2
7. Lower Courtyard at level 1
8. Entrance from Courtyard
9. Main entrance at level 1
10. Central entrance at level 2
11. Seasonal entrance



Aluminum shingle-style and composite wood veneer exterior wall panel
Inspired by the underlying structure in indigenous arts and craft, animal skins and the shingling of traditional haudenosaunee longhouses, this building envelope made of parallelogram and trapezoidal shingled aluminum wall panels in combination with composite wood veneer wall panels, wraps the building mass and administration floors at the upper levels.

2. The main circulation corridor along Wisdom Hall features acoustic wood baffles that undulate to mimic the flow of water.



Driven by indigenous principles - Based on indigenous principles, the design of the building is a poetic response to the pattern of seed, growth, culmination, and balance in a continuous cycle. The position of spaces and the flow through the building are guided by the medicine wheel teachings oriented to the four cardinal directions, and the directions of up, down, and centre.

The geometry of the exterior envelope is inspired by the underlying structure in indigenous arts and craft, animal skins and the shingling of traditional haudenosaunee longhouses. The cladding combines parallelogram and trapezoidal shingled aluminum wall panels in combination with composite wood veneer wall panels, which wrap the building mass and administration floors at the upper levels. The envelope of the classroom block complements and balances the architectural form, grounding the building through the west of the site. It is clad in large and elegant anthracite grey solid phenolic wall panels.

Large areas of triple glazed aluminum framed curtain wall reveal the underlying wood structure, exposing student, staff and faculty life while alluding to the drawing back of the skins over a traditional Haudenosaunee wigwam frame in response to seasonal temperature changes.

INTERIOR DESIGN

Internally, the plan is organized along Wisdom Hall, a highly transparent, 4-storey diagonal atrium space for user engagement & study zones with a grand stair that ascends from the East entrance toward the West, lined with Indigenous stories

Entering the building from the East, students ascend the grand stair, animating the main spine of the building through a series of informal learning spaces designed to facilitate spontaneous conversation and the sharing of ideas.

Reaching the top at Level 3, the stair culminates at a large Student hub and café that showcase Indigenous food offerings, allowing students to experience Indigenous culture through its cuisine.

The main circulation corridor along Wisdom Hall features acoustic wood ceiling baffles that undulate to represent the flow of water, a key element that is richly woven through Indigenous stories, customs, and heritage. On each side of the baffles, commissioned artwork tells a Creation Story. Students may learn the story of the Anishinaabe as they walk West to class and the story of Haudenosaunee on their return towards the East.

Drumbeats frequently reverberate from the circular Indigenous Commons. This space is the physical and spiritual heart of the A-Building Expansion, a important space for gathering and ceremony. Light bathes the space from a clerestory above, with Douglas-fir ribbons intricately woven between 13 mass-timber ribs that represent the13 annual cycles of the moon.

A muted colour palette showcases the mass timber structure that is exposed across all program areas. Rift-cut white oak and white solid surfacing elements are complimented by bright accents of red.

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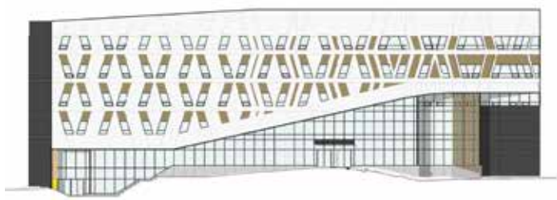

North elevation

North atrium section

West elevation

West section

3. The grand stair animates the main spine of the building through a series of informal learning spaces designed to facilitate spontaneous conversation and the sharing of ideas.
4. The ground floor structure is cast-in-place concrete above which are five storeys of glulam post and beam construction, most of which is left exposed.

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PROJECT PERFORMANCE
ENERGY INTENSITY (BUILDING AND PROCESS ENERGY) = 106 KWhr/m^2/year
ANNUAL ON-SITE RENEWABLE ENERGY EXPORTED = 69,000 kWh/year
ANNUAL NET ENERGY USE INTENSITY = 98 kWh/year
ENERGY SAVINGS RELATIVE TO OBC SB-10 REFERENCE BUILDING = 40%
ANNUAL ENERGY COST (ECI) = $14/m^2/year

PROJECT CREDITS
OWNER/DEVELOPER Centennial College
PROJECT MANAGER Colliers
DESIGN/BUILD CONTRACTOR Ellis Don
ARCHITECT DIALOG Architects and Smoke Architecture
LANDSCAPE ARCHITECT VERTECHS DESIGN
CIVIL ENGINEER Walter Fedy
MECHANICAL & ELECTRICAL ENGINEER Smith + Andersen
STRUCTURAL ENGINEER RJC Engineers
PHOTOS James Brittain

Red-glazed tile envelops the vertical core while playful red accents highlight soft furnishings in key social areas of the building. Red signifies knowledge and learning in Indigenous culture, and in the A Building Expansion also serves to inform intuitive wayfinding.

ACHIEVING NET ZERO CARBON

A-Building has achieved net zero carbon certification through a combination of simple strategies:

- a highly efficient building envelope including 0.28 Ucog triple glazing, R-20 Effective R-Value walls, and an R-34.6 Effective R-Value roof;
- all-electric domestic hot water heating and HVAC systems (including extract ventilation sufficient to enable smudging ceremonies to take place in 13 rooms);
- a rooftop solar photovoltaic array.

The photovoltaic array is designed to generate enough electricity to offset the facility's electricity use by 68,000 kilowatt hours annually.

As Canada's first LEED Gold, Net-Zero carbon, WELL certified, mass timber, higher-education facility, the A-Building Expansion exemplifies Centennial College's commitment to environmental sustainability, indigenous design principles, and social responsibility. Beyond its quantitative achievements, the poetic response to the client's aspirational brief offers an inspiring vision of what true reconciliation could look like.

CRAIG APPLEGATH FRAIC OF DIALOG WAS THE LEADER OF THE DESIGN TEAM.

5. The circular Indigenous Commons, bathed in light from above, is the physical and spiritual heart of the A-Building Expansion, a space for gathering and ceremony.
6. Hot water heating and HVAC systems are all electric.