Institutional (Large) Award
Perkins&Will

BARRETT CENTRE FOR TECHNOLOGY INNOVATION

Humber College, Toronto, ON

Jury Comment

This project is significant for its innovative use of parametric software; not for abstract form-making, but for taking a first principles approach to passive design. In many cases, the LEED Platinum and Net Zero ambitions for the project would have resulted in an uninspiring box-like form.

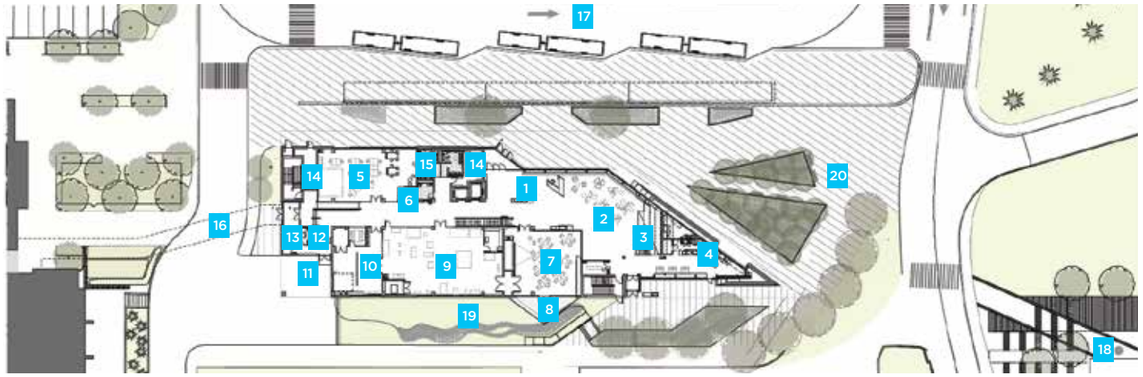
Instead, the result can be considered a kind of 'place and performance-based regionalism'. The flexible arrangement of learning spaces, the bright and colourful interiors and park-like accessible roof all enrich the experience of this building, within its bland suburban context.

1. The building acts as a dramatic portal; its dynamic glazed lobby and cantilevered form creating spaces for the exchange of information and ideas to inspire an informal and active learning experience.

This net-zero energy building is a first for Humber College and is targetting LEED Platinum certification. The facility sets a precedent for innovation in automated manufacturing and human-centred solutions, omitting classrooms entirely. Instead, flexible project modules provide space for fabrication and technical zones for students, faculty, and industry to explore, research and fabricate together.

The experience of the BCTI begins the moment one steps onto campus. The building acts as a dramatic portal; its dynamic glazed lobby and cantilevered form creating a new focus for student life. The BCTI features active and social spaces like interactive demonstration areas and flexible open-concept gathering areas.

These spaces are designed to enable a free exchange of information and ideas to inspire an informal and active learning experience. The central atrium offers an immediate connection to the outdoors through views to surrounding landscaped spaces and campus and ample access to natural light. The building achieves net zero energy through a conservation first approach, driven by parametric analysis of solar radiation, daylight penetration, natural ventilation and envelope optimization, supplemented by a 700 kW solar PV array located on an adjacent parking structure. Beyond this, the project embodies a holistic approach to sustainability, in alignment with the College's values: green rooftop teaching spaces, urban agriculture pods, and visible high-performance building systems that foster a culture of environmental stewardship as a vital aspect of entrepreneurial innovation. Materials have been chosen for low environmental impact, occupant health and wellbeing, durability and climate change resilience.



Site plan

1 Welcome Zone
2 Social Space
3 Seating Stair
4 Cafe and Kiosk
5 Collaboration Sandbox
6 Resource Work Room
7 Demonstration Room
8 Outdoor Demonstration Space
9 Tech Zone—Wood and Metal
10 Wet Module
11 Mobile Tech Bay
12 Shower
13 Janitor
14 Mechanical and Electrical
15 Washroom
16 Pedestrian Bridge
17 Bus Loop
18 Parking Garage
19 Rain Garden
20 Plaza

Level 2

1 Makerspace Equipment Storage
2 Module A
3 Tech Zone - Digital 3D Development
4 Project Room
5 Lockers
6 Gaming Area
7 Learning Commons
8 Aboriginal Display
9 Work Room
10 Seminar Room
11 Skills Training Hub Module A
12 Skills Training Hub Module B
13 Module B
14 Coffee Bar
15 Mechanical/Electrical
16 Washroom

2

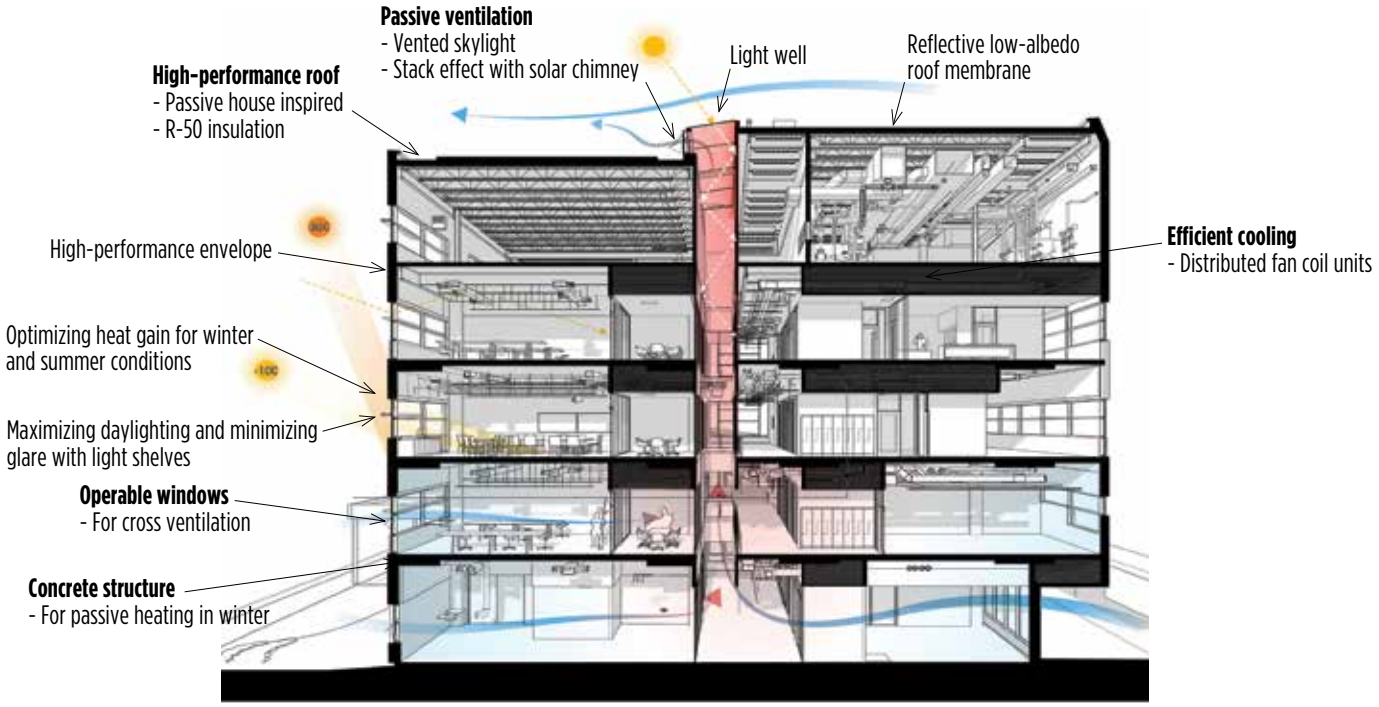
3

PROJECT CREDITS
ARCHITECT Perkins+Will
OWNER/DEVELOPER Humber College
GENERAL CONTRACTOR Bird Construction
LANDSCAPE ARCHITECT Brodie And Associates
CIVIL ENGINEER EXP
ELECTRICAL/ MECHANICAL ENGINEER MCW Consultants
STRUCTURAL ENGINEER Thornton Tomasetti
LEED CONSULTANT Fluent
BUILDING ENVELOPE RDH
ACOUSTICS, NOISE AND VIBRATION Aerocoustics
ACCESSIBILITY Designable Environments
BUILDING CODE LRI
PHOTOS: Scott Norsworthy (photo 4), Tom Arban Photography (photos 1, 3 and 5), Joe Markovic Photography (photo 2)

PROJECT PERFORMANCE
ENERGY INTENSITY (BUILDING AND PROCESS ENERGY) = 99.8 KWhr/m²/year
ENERGY INTENSITY REDUCTION RELATIVE TO REFERENCE BUILDING = 100% (all energy supplied by renewables)
WATER CONSUMPTION FROM MUNICIPAL SOURCES = 1,559 litres/occupant/year
REDUCTION IN WATER CONSUMPTION RELATIVE TO REFERENCE BUILDING UNDER LEED = 40%
RECYCLED MATERIAL CONTENT BY VALUE = 24%
REGIONAL MATERIALS (800KM RADIUS) BY VALUE = 34%
CONSTRUCTION WASTE DIVERTED FROM LANDFILL = 85.3%

2. The partly vegetated roof contributes to stormwater retention. Around the building exterior the **ACO KlassikDrain** handles stormwater collection in the form of an aesthetically pleasing linear trench drain which helps to maintain smooth surface grading while preserving building accessibility. With proven performance in winter conditions, it also provides LEED credit eligibility for regional manufacturing.
3. A mix of cladding was used on the project. **CBC Specialty Metals** supplied through Bothwell-Accurate Co. Inc the VMZINC® ANTHRA-ZINC® STRAT Interlocking Panels, having expected lifespan of over 100 years. Quarried in Ontario, Adair natural limestone by **Arriscraft**, used around the base of the building, is unique in the industry offering unparalleled distinction and longevity for commercial projects.
4. Concrete floors provide thermal mass and also influenced the distinctive form of the building.

4



Building section

The parametric modelling analysis optimized both the massing and envelope resulting in a highly insulated façade, concrete floors acting as thermal mass in the lobby, and also influenced the distinctive form of the building. A window-to-wall ratio of 40% emphasizes glazing where daylight is beneficial to support occupant health, particular in active learning spaces, collaboration zones and circulation paths. Brise Soleil shading devices on the south façade mitigate heat gain and glare, while a thermal chimney enables natural ventilation during more temperate seasons.

The design team also used dynamic multi-parametric modelling software to adjust various envelope parameters including R-value, infiltration rates, and solar heat gain co-efficient for glazing to find the most efficient and cost-effective combination of elements.

A dark natural zinc plank system was chosen as cladding for its durability and modularity, facilitating long term maintenance. Durable, natural limestone along the base of the building provides a direct material connection to the surrounding natural landscape. Materials were screened for embodied carbon, and reductions were achieved through use of FSC lumber, low-carbon insulation, low-carbon exterior cladding material, reduction in glazing, low-carbon refrigerants, and aluminum in place of steel for window assemblies.

The BCTI features an enclosed roof terrace and garden that allows for food production and a habitat for butterflies and pollinators. It also contributes to stormwater retention and replenishment of onsite vegetation, nutrients in soils. Planted areas use native and drought-resistant species, creating micro habitats that contribute to the greater local ecosystem.

5. The building achieves net zero energy through a conservation first approach, driven by analysis of solar radiation, daylight penetration, natural ventilation and envelope optimization. Lochinvar by **Aqua-Tech** supplied two Crest Condensing Boilers Model FBN1751 for space heating and domestic hot water, and a GVC65JR Hot Water Generator c/w Double Wall Tube Bundle for indirect domestic hot water demand.