

LEED®-NC Gold Certified

Owner:
Humber College

Architect:
Architects Alliance/
Taylor Hazell Architects

**LEED Consultant,
M/E Engineers,
Commissioning Agent,
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Verification:**
Enermodal Engineering Ltd.

Civil Engineer:
MTE Consultants

Structural Engineer:
Blackwell Bowell
Partnership Ltd.

Landscape Architect:
Diana Gerrard
Landscape Architecture

Contractor:
JD Strachan

The Humber Arboretum Centre for Urban Ecology

Toronto, Ontario



PHOTO CREDIT ENERMODAL ENGINEERING

The Humber Arboretum Centre for Urban Ecology is a striking two-storey glass building overlooking a natural wetland near the West Humber River in Toronto. The Centre is home to environmental education programs hosted by the Arboretum and also acts as a living lab for students of the Humber College School of Applied Technology. At the core of Centre programming is a commitment to reducing the impact of human activities on the natural processes that support life on earth. In keeping with this commitment, the building's unique features include a green roof, natural cooling, and exceptional water conservation strategies.

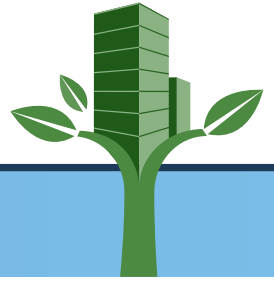
Site Planning for Reduced Impacts

Eighty per cent of the Centre's roof is planted in native sedum. Green roofs absorb solar radiation and do not contribute to the urban heat island effect. The roof plantings also reduce building temperatures in summer. To further reduce the urban heat island effect, many of the "hard" landscaping elements around the Centre are highly reflective. Paths covered with crushed granite and limestone gravel are permeable and allow rainwater to percolate into the soil.

The Centre preserves an important open space within an urban landscape and more than half of the building site is devoted to open space. The landscape plan emphasizes the use of native trees (basswood, river birch, poplar) and grasses (fescues, rye). The open space performs several functions:

- provides needed wildlife habitat
- cools the landscape
- moderates the volume and quality of stormwater runoff
- requires little irrigation

A "night-sky friendly" exterior lighting plan avoids contributing to light pollution.



Water Conservation Inside and Outside

Exceptional water savings were achieved both outside and inside the Centre. Outside, a 86% reduction in water used for irrigation is due to the use of drought-resistant native species for landscaping and rainwater harvesting. Irrigation water is supplied from rainwater that is harvested from the roof and stored in a 10 m³ cistern. Inside the Centre, low-flow plumbing fixtures reduced water use by 35%. These fixtures include low-flow urinals, dual-flush toilets, and low-flow faucets in kitchen and bathrooms.

Natural Cooling Integrated with Building Form

A stairwell that extends above the roofline, together with automatic wall panels and windows, creates a “thermal chimney.” When cooling is required, windows open to admit cool air. The air (and heat) rises and exits the building through the thermal chimney’s wall panels. Motorized dampers and a low power exhaust fan also promote this natural air flow. The Centre has no mechanical air conditioning system, and this has two main benefits:

- reduction in electricity use, particularly during peak summer demand
- elimination of chemical coolants

Natural cooling is aided by two other design features. Exposed concrete walls cool during the evening. During the day, these walls keep the indoor air temperate moderate by absorbing heat. Wide overhangs and nearby shade trees also help to keep the building temperature cooler.

Overall energy savings are predicted to be 60% compared with a similar building of conventional design. These savings are attributed to high performance windows, a well-insulated building shell, lighting controlled by occupancy sensors, and energy-efficient mechanical equipment.

On-Site Wastewater Treatment

On-site wastewater treatment using a [Waterloo Biofilter](#) system reduces the environmental impact of municipal sewage treatment and does not require a large tile bed. Wastewater is treated by microbes living in a foam biofiltration medium. The microbes degrade and oxidize organic pollutants, coliform bacteria, and other contaminants. The clear, treated effluent is pumped to shallow pressure trenches nearby.

For more information, contact
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