

YORK COMPUTER SCIENCE FACILITY

Project Description

York University directed the design team to achieve a warm, open, welcoming facility that would be simple and flexible enough to accommodate unpredictable future technology. An additional objective evolved out of the design process: this would be the first new institutional project in Ontario that would be "green", with a design based on a commitment to achieving environmental sustainability objectives. This project offered us the opportunity to implement a green design approach in a "cold weather" climate.



South Elevation

Client
Architects

York University
Busby + Associates Architects
In association with

Structural Engineer
Mechanical Engineer
Electrical Engineer

Van Nostrand di Castri Architects
Yolles Partnership Inc.
Keen Engineering Co. Ltd.
Carinci Burt Rogers Engineering

BUSBY + ASSOCIATES ARCHITECTS

Sustainable Sites

The choice was made to build on this campus infill site - a gap between two existing buildings reserved for construction - rather than the natural fields surrounding York. Site disturbance was minimized - no brownfield cleanup was required, and the building is a stacked development for maximum area with as small a footprint as possible. A special consideration during construction was contamination of the intake air of the neighbouring building, remedied by developing a temporary 30 foot stack for that air intake. Landscaping involved native vegetation. For stormwater management, a planted roof replaces lost ground level vegetation and acts as a holding tank to strictly control runoff. The planted roof is also an exterior design/landscaping tool to reduce heat islands, as do the permeable walkway surfaces and new shade trees. Light pollution meets IESNA requirements. Adjacency to two bus lines, and the provision of bicycle racks and showers encourage alternative transportation, and no additional parking stalls were provided.

Water Efficiency

The planted roofs of wild grasses will not need irrigation after the first and second growing season. Domestic water use is reduced with low flow toilets and urinals.

Energy and Atmosphere

This building is designed to function at a 50% energy reduction over ASHRAE 90.1. The design was based on natural ventilation airpaths (openings, atriums, stacks, operable windows, relief hoods). An efficient envelope, the building shape, external shading, and an accessible thermal mass all contribute to the energy reductions achieved. The sod roof provides evaporative cooling during the summer, and added insulation during the winter. Computer laboratories are placed on the north façade to capture efficiencies in energy consumption and communications systems. There are no CFC's in cooling and HVAC systems. HCFC's are still present using standard R-22. The total building is monitored using DDC systems, including electrical and gas metering and overall building energy metering. Extensive one to two year commissioning of the natural ventilation and traditional systems will be necessary to optimize performance in each season.

Material and Resources

The building incorporates 100% recycled reinforcing rebar, and recycled aluminum for glazing systems. EcoSmart™/flyash concrete was used, reducing potential emissions of regular concrete production by 50%. Sustainable recycled fabrics were specified for new furniture. Though not specified at least 20% and more likely 50% of the materials used were regional. A waste management program was specified as part of the tender documents. During operation, York University recycling policies will be in place.

Indoor Environmental Quality

The entire design was based on natural ventilation strategies including operable windows, high level stack ventilation, and atrium ventilation, to maximize free cooling in spring and fall, and for night time flushing during the summer. Controls involve independent weather station monitoring of wind direction speed and precipitation. Within each occupied space there are visible and accessible controls for operable windows, individual air diffusers and lighting. After hours use of lighting systems is tied to the phone systems. Thermal Comfort has been maintained as per LEED™ guidelines. CO2 monitoring has been included in lecture hall and main atrium space. Low VOC requirements were maintained for adhesives, paints, carpets and fabrics, all of which have green label status