



Federal Court Building

LOCATION: 180 Queen Street West, Toronto, Ontario

FLOOR SPACE: 20,907 m² (225,000 ft²)

BUDGET: \$7.5 million CAD

CONSTRUCTION DATES: 2003-2006

OWNER: GWL Realty Advisors

ARCHITECT: Kuwabara Payne McKenna Blumberg (KPMB)

CONTRACTOR: Ellis Don Construction Ltd.



Rated Four Globes
Out of Five

*Please note that Green Globes™ uses a four globe scale in the U.S.
Four Globes in Canada is the same as 3 in the U.S.

Project Notes

Project Management

Integrated Design Process (IDP)

- Team approach used throughout the design process involving collaboration between architect, engineers, consultants, and occupants

Site

Development Area

- Building located on an existing urban serviced site with density of least 60,000 ft²/acre (14,000 m²/ha)
- Minimal disturbance to site topography, soils and vegetation

Minimization of Ecological Impact

- Erosion control measures in accordance with best management practices (BMPs)
- At least 30% of impervious surfaces at grade shaded by colonnade
- Infrastructure for future green roof (i.e. inverted roof membrane with root barrier)

Enhancement of Watershed Features

- Stormwater management in compliance with the City of Toronto's Storm Water Protocol

Enhancement of Site Ecology

- Naturalized landscape with minimal lawn cover

Energy

Energy Demand Minimization

- Layout optimized to reduce the amount of space to be heated and cooled
- Orientation of building along east-west axis to optimize microclimate conditions for heating and cooling
- Colonnade located on southern and eastern sides of building to provide shelter against wind and snow

Integration of Daylighting

- Fenestration strategies suitable to microclimate conditions for each elevation
- Electrical lighting and natural daylighting integrated through use of the Digital Addressable Lighting Interface (DALI) protocol

Building Envelope

- Window glazing with low U value (0.29) and window treatments to enhance interior thermal comfort
- Building integrity optimized using best air/vapor barrier practices
- Building design and construction that prevents the "stack effect"

Energy Metering

- Extensive sub-metering

Energy-Efficient Systems

- Extensive use of energy-efficient equipment including: lighting controls, HVAC equipment, condensers, Building Automation System, variable speed drives, and energy-efficient motors

Energy-Efficient Transportation

- Public transportation within 500 yards, with service at least every 10 minutes
- Changing facilities for cyclists

Water

Water Conserving Features

- Water-saving devices including waterless urinals, low flush toilets using less than 1.6 gallons/flush (6 L/flush), faucets using less than 2.0 gallons/min (7.5 L/min), and showerheads using less than 2.4 gallons/min (9.0 L/min)

Resources

Systems and Materials with Low Environmental Impact

- Selection and specification of concrete structural systems based on a life-cycle assessment of the environmental burden and embodied energy
- Locally-produced materials including stone and cherry wood for interior finishes

Materials that Minimize Consumption of Resources

- Building assemblies including pre-cast concrete panels specified for their durability and low maintenance requirements
- Materials that come from renewable sources or which are locally manufactured and which have undergone a life-cycle assessment
- Timber panels from certified and sustainable sources

Building Adaptability and Disassembly

- Generic structural concrete form, readily adaptable to changing requirements
- Selection of materials and fastenings that allow for easy disassembly

Facilities for Recycling and Composting

- 330 ft² (30.6 m²) of space designated for storage of recyclable waste

DALI

DALI or Digital Addressable Lighting Interface improves the lighting quality of a building. The system allows for each lighting component to be controlled from a central point, making it easy for building technicians to control, adjust, and track lighting system usage. The DALI system also integrates lighting control, passive infrared (PIR) movement-detection devices. The switch operates by sensing the difference between infrared energy from a human being in motion and the background space.

Emissions, Effluents

Minimization of Air Emissions

- Low-NOx boilers and furnaces that meet Ontario Ministry of the Environment Air Contaminants Emissions certificate approval

Minimization of Ozone-Depletion

- Cooling system that complies with the requirements of the Federal Halocarbon Regulations under CEPA and the Safety Code for Mechanical refrigeration, ASHRAE 15 – 1991
- Refrigerant (R 134A) in chillers with an ozone-depleting potential of 0

Prevention of Sewer Contamination

- Scupper drains to prevent pollutants from entering sewers and waterways

Pollution Minimization

- Diesel storage tanks with double wall construction, located inside a spill-protected steel enclosure, and in compliance with the Federal Technical Guidelines for Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products and Technical Guidelines for Aboveground Storage Tank Systems Containing Petroleum
- Ventilated storage for hazardous cleaning materials

MICROCLIMATE DESIGN

To benefit from a design that is responsive to the microclimate, KPMB employed a variety of elevation designs, shading and fenestration strategies to protect occupants, improve indoor quality, and lower energy consumption.

The south and west facades include cantilevered aluminum panels, which protect the interior space from excessive daytime heat gain, while the north elevation minimizes heat loss by increasing the wall to window ratio. Pedestrian colonnades located on the South and East elevations of the building offer protection from the elements.

Indoor Environment

Effective Ventilation System

- Inlets upwind of outlets, and positioned at least 30 ft (10 m) apart from them to avoid re-entrainment
- Main air intakes located more than 60 ft (30 m) from major sources of pollution and at least the minimum recommended distances from lesser sources of pollution
- Ventilation in accordance with ANSI/ASHRAE 62 – 1999
- A reported design ventilation rate of 9 cfm/person
- Continuous CO₂ indoor air quality monitoring
- Ventilation system capacity to flush out the building with 100% outside air at ambient temperatures above 32°F (0°C)

Source Control of Indoor Pollutants

- Measures to minimize the accumulation of moisture within the building and prevent the growth of fungus, mold, and bacteria on building surfaces
- Access points for air-handling units (AHUs) that are easily accessible to facilitate maintenance
- Continuous CO₂ monitoring in parking garages
- Wet cooling tower designed and located to avoid the risk of Legionella bacteria growth
- Domestic hot water systems designed to prevent the occurrence of Legionella bacteria growth

Lighting

- Direct ambient daylighting provided to 80% of primary spaces
- Views to the building exterior from all primary interior spaces
- Solar shading devices to enable occupants to control brightness and glare from direct daylighting
- Upper parts of the windows protected with white ceramic frit, which reduces solar gain

Thermal Comfort

- Building design that conforms to ASHRAE 55 – 1992, Addenda 1995 for thermal comfort

Acoustic Comfort

- Spaces within the building zoned to provide optimum protection from undesirable outside noise, and which fall within acceptable noise criteria ranges
- Sound transmission class (STC) rating of 50 for exterior walls
- Measures to mitigate acoustic problems associated with mechanical equipment noise, vibration, and plumbing systems
- Noise attenuation of the structural systems
- Insulation of primary spaces from impact noise using a floating mechanical floor

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