PEOPLE-ORIENTED BUILDINGS

- A PAGE FROM HH ANGUS HISTORY

Toronto-Dominion Centre, Toronto

Peter Willings

Editor: As the Commercial Division continues to make inroads into new sectors (eg: renovation of BMO Field) , and to win larger tenant fit out projects (eg: 60,000 ft2 for Random House), it's useful to understand how the commercial sector has evolved for HH Angus. For example, LEED standards and sustainable design for both new buildings and existing infrastructure is a key concern for our clients, but this has actually been the case for many years. In fact, our experience in sustainable design dates back almost 40 years, which underscores our long-held philosophy of 'why would we design any other way?' In this excerpt from a larger paper, Peter Willings highlights a number of milestone projects that have contributed to HHA's portfolio of significant buildings.

HH Angus has a long history designing systems for prestige office buildings for financial and institutional corporations. As early as the 1950s, the company was designing head office facilities for a number of companies in downtown Toronto, such as North American Life and Crown Life. These were owner-occupied buildings, approximately 16 storeys, with 1000 lux lighting, single-glazed fenestration, high-pressure induction air-conditioning systems serving perimeter offices, and low-pressure terminal reheat interior zone systems.

In the 1960s, escalating land costs created a demand for high rise buildings, leading to the construction of the Toronto Dominion Centre, the first tower being a 54-storey, steel and glass clad tower, with three banks of elevators, serving high, low and midrise floors. This Mies van der Rohe-designed building was Canada's first 'skyscraper'.

The lighting levels were in the order of 1000 lux, fenestration was single glazed, with floor to ceiling windows, and the building was divided into sections with mechanical spaces on the 13th, 43rd, and 54th floors. Air-conditioning systems consisted of high pressure induction units at the perimeter, and high pressure terminal reheat interior zones. High pressure steam for heating and humidification was supplied from the Toronto District Heating System (a system designed by HH Angus). Chilled water for cooling was generated in an electrically-driven centrifugal plant located on the 54th floor mechanical penthouse, with the cooling tower located in a well in the building roof. This tower enjoyed substantial success in attracting high-value tenants; lawyers, brokers and corporate headquarters of mining and manufacturing firms.

The second, third and fourth similar but smaller TD Towers followed in rapid succession. Simpson's Tower (major retailer headquarters) at the corner of Bay and Queen Streets in Toronto was a repeat of the basic mechanical and electrical concepts in a building with a concrete frame and precast concrete cladding. Office buildings, which used the same basic mechanical and

electrical concepts followed in Vancouver, BC for Vancouver Centre and the Bank of Nova Scotia, and in Regina, SK for Toronto Dominion Bank.

In the 1970s, attention shifted to landmark building concepts: the Royal Bank Plaza with two towers aggregating more than one million square feet and a folded fenestration arrangement with gold tinted glass, and an internal source heat pump transferring internal heat gains through the chilled-water plant to the perimeter induction system, and variable volume interior zone air-conditioning system. The building has a fire suppression system (sprinklers) with a hydraulic-sized water distribution system. An extensive building automation system was incorporated to monitor the performance of the mechanical and electrical systems. It was integrated with the building fire alarm system to implement smoke control routines, providing exhaust from the fire floor and pressurization of the floors above and below fire floors to prevent the spread of smoke. Similar designs were incorporated in the office towers in the Eaton Centre Complex at Yonge and Queen Streets.

In the latter part of the 1970s and early 1980s, office buildings at College Park, the IBM Education Centre on Steeles Avenue in Markham, and the Government of Canada Building in the Scarborough Town Centre were designed with energy-saving lighting systems, variable volume air-conditioning


Toronto-Dominion Centre, Toronto


Eaton Centre, Toronto

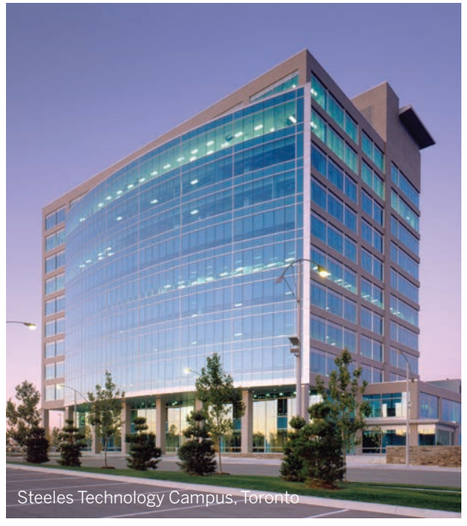

Royal Bank Plaza, Toronto

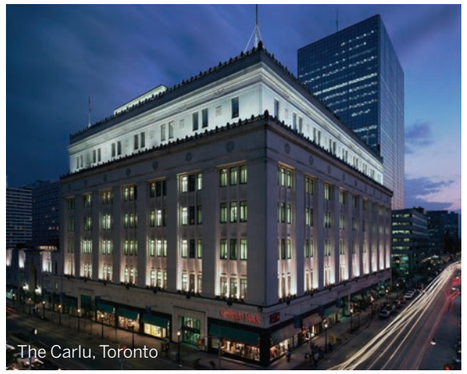
systems serving both interior zone and perimeter zones, and low temperature recovered heat perimeter radiation. Each of these buildings incorporated "compartment air handling units" distributed by floor or by module, and supplied with centrally-conditioned fresh air for ventilation of occupied spaces. All three buildings used an internal source heat pump plant, with the IBM facility incorporating a heating and cooling water storage tank system to permit plant operation during "off peak" periods to minimize energy cost.

The Government of Canada Building heat pump uses an underground aquifer to provide heat in winter and as a condensing medium in summer, and the building chilled water and heating water systems incorporate tank storage to permit plant operation "off peak". These buildings also saw the first major use for 'small power' at the workspace, as 'dumb terminals' started to appear when employees became linked to large central mainframe computers. Prior to 1980, the typical workspace might plug in a tea kettle, an electric typewriter or a calculator.

In late 1980s and 1990s, office buildings were designed in London, UK and Shanghai, China, using the heat pump - compartment concepts. In London, the buildings at Canary Wharf included No. 1 Canada Square and Citigroup Tower. All these buildings exceeded 100,000 m2 of net rentable area. Also in London were Financial Times, Red Lion Court and The Royal Bank Building, among others. A second building for IBM in Markham, ON of 82,000 m2 advanced the heat pump - compartment scheme by incorporating ice building and ice storage, and low temperature chilled water to permit variable volume low temperature air systems, with significant reduction in ceiling space congestion. A study for the London Docklands Development Corporation in this same period identified financial advantages in the implementation of a private utility generation and distribution system using cogeneration of electric power, with recovered central heating and chilled water distribution systems. During this period, lighting went through a number of technological changes as energy efficiency was tempered with colour rendition, eye strain and glare from the by-now-common reflective surface of the computer screen. The energy savings on HVAC systems was rethought and larger fresh air quantities were mandated.

As this millennium grows, we continue building our portfolio of state-of-the-art technologies, ever-increasing energy efficient design and prestigious space. Buildings at Canary Wharf were added for Clifford Chance and Barclays, both exceeding 100,000 m2. In Toronto, we completed Phase 1 of the Steeles Technology Centre and in Calgary, the


Steeles Technology Campus, Toronto


The Carlu, Toronto


Government of Canada Building, Scarborough

Trans Canada Pipelines Building, both leading-edge IT designs. A recent building, the Terrence Donnelly Centre for Biomolecular and Cellular Research at the University of Toronto, incorporates a ventilated fenestration system designed to reduce solar heat gain and minimize transmission heat loss. This concept is generally more suited to the more moderate climates encountered in Europe, but the installation shows economic viability in Toronto as well. Certification for energy efficiency (BREAM certification in the UK and LEED in Canada) is important to landlords and tenants alike, who want to market 'green' corporate images.

We're proud of our history, our contributions to the technological development of office space, our cutting-edge designs balanced with sound engineering, and the landmarks that stand as testimony to our clients and the architectural vision they brought into reality by the design teams on which we have served. **AP**

Canary Wharf, UK

Barclays, UK

Terrence Donnelly Centre for Biomolecular & Cellular Research, Toronto