TELUS WILLIAM FARRELL BUILDING

Floor space: 130,000 ft^2
Budget: $13.0 million CDN ($100/ft^2)
Building population: 500
Original building construction: 1947
Restoration construction dates: 1999-2000

Owner: Telus, represented by Pat Balfour and Doug Green
Architect: Busby + Associates Architects Ltd.
Structural Engineer: Read Jones Christoffersen
Mechanical Engineer: Keen Engineering Co. Ltd.
Electrical Engineer: Reid Crowther & Partners Ltd.
General Contractor: Dominion Construction Co.

Project Notes

Sustainable siting

- **Site selection:** Revitalized existing building. This was significant since the initial thought was that it might make more sense to build a new facility. Telus chose to restore the existing building to define a "new" corporate downtown presence with a strong, fresh image as well as a major environmental statement.
- **Alternative transportation:** Building is on a bus line, 100 yards from main bus depot and 200 yards from a Light Rapid Transit station. In addition, the building has a bicycle-storage area, changing rooms, lockers and showers.

Energy and atmosphere

- **Energy:** Because of insulating second "skin," consumes only 61% of ASHRAE standards.
- **Solar power:** Building-integrated photovoltaics (BIPV) generate power to drive fans to exhaust the heat from the cavity between the original building and the added glazing.
- **HVAC:** All-new, CFC-free equipment.
- **Heat efficiency:** Primary heat source is waste heat from existing refrigeration plant in the building complex.
- **Comfort:** Under-floor air lowers energy use and provides occupant control. Operable windows throughout have been re-installed to allow maximum user control and satisfaction.

Materials and resources

- **Structure:** Avoided 16,000 tons of waste by revitalizing an existing building rather than building anew. Bolted steel connectors on new elements of building facilitate future deconstruction.
- **Recycling:** Drywall, carpet, reinforcing bars and structural steel were primarily recycled or reused. Façade at entry stone re-cut to fit new and reused windows. Twenty-five percent fly ash content in new concrete.

Indoor environmental quality

- **Ventilation:** Fresh air and cross-ventilation is provided by operable interior and exterior windows.
- **Lighting:** Light shelves in the building's second skin direct sunlight deep into the interior.
- **Views:** Clear glass and open space offices allow first line of sight to vision glazing for 90% of occupied spaces.

On the corner of Seymour and Robson streets in downtown Vancouver, B.C. stands the futuristic Telus building. Its sheer glass front fits nicely within the City's very modern aesthetic. But the most impressive aspect about the building isn't readily apparent from a distance: this structure was originally built in 1947, and is now among the City's most energy-efficient buildings.

In 1998, a voluntary seismic program in Vancouver dictated that something needed to be done about the William Farrell Building, currently the B.C headquarters for Telus, one of Canada's largest telecommunications companies. The Telus project team decided that instead of demolition, they would retrofit the building.

Laying out the plans

Before designing the revitalized William Farrell Building, and even before choosing a design team, the company determined a list of project goals:

1) Meeting internal business needs
2) Reflecting company values
3) Demonstrating leadership
4) Contributing positively to the Robson streetscape
5) Proceeding with the redevelopment using sustainable, environmentally conscious building strategies

Busby + Associates Architects was ultimately chosen for the job. Telus was impressed with their eagerness and commitment to "build green." The design team was strengthened by their collaboration with Keen Engineering Co., which was similarly excited to develop environmental innovations.

Getting going

The design team's central assessment was that a new façade should be added to the Telus building. Standing 36 inches away from the building's original façade, this "second skin" provides a variety of benefits, including enhanced ventilation, seismic protection, much higher energy efficiency and improved internal lighting, not to mention a very sleek and modern look to the building's exterior.

With this renovation came the enormous challenge of construction. Whereas most projects work from the inside out, the design and construction teams determined that this building needed to start with the exterior. Additionally, the Telus building needed to remain occupied and operational throughout construction.

This meant that a balance was needed between the jackhammers and other heavy construction tools used on the outside, and the sensitive high-tech equipment inside. This was accomplished by creating tiny construction zones, which limited the size of the area impacted by the builders.

Growing a second skin

The new façade is in many ways a very impressive feat. The glass in the new exterior is comprised of double-glazed sealed units with a low-E coating. The glass units use a baked ceramic "frit" coating to provide shading and limit internal heat gains, greatly increasing the skin's energy efficiency. Telus employees can open and close windows on the new outer wall from switches at each floor of the building, allowing fresh air in through each of the building's two skins.

At the top level of the new façade, photovoltaic cells harness solar energy to activate dampers and fans on the roof to exhaust warm air from the cavity on hot summer days.

The steel support beams in the new façade serve to route two-way fiber optic cables throughout the building.

> "This project will set a new benchmark for environmentally responsible building design in downtown Vancouver."
>
> —Dr. Ray Cole, Professor at the University of British Columbia

Using energy wisely

In addition to the second skin, several innovations inside the building further increase energy savings. In many places, removing the suspended office ceiling gains space and dynamic thermal storage. Also, parts of the floor were raised for under-floor air and wiring capacity.

Energy efficiency was also helped tremendously by recycling heat. Waste heat from a refrigeration unit in another part of the building complex supplies 85 percent of the building's heat. While it is an industrial standard to treat waste heat as just that, the project team saw an excellent opportunity to capitalize on an untapped resource. This feature alone has inspired a number of other green building projects that have sought other similar methods of energy reclamation.

In combination, these measures have allowed the building to operate at energy savings 39 percent greater than required by city bylaws; the company's energy savings have been three times what they predicted would be possible even at the outset of the project.

Awards and Honors

2001 Design Resource Award, First Place
2000 Award of Excellence, Consulting Engineers of British Columbia
2000 National Energy Efficiency Award
International Green Building Challenge 2000, Maastricht, Netherlands

Case study sponsored by:

Seattle Public Utilities
Washington State Department of Ecology
King County
O'Brien & Company
Interface Engineering
Glumac International
BC Buildings Corporation