

C.K. CHOI BUILDING

CASCADIA REGION GREEN BUILDING COUNCIL



FLOOR SPACE: 34,445 ft²

BUDGET: \$4.5 million CDN (\$150/ft²)

BUILDING POPULATION: 300

CONSTRUCTION DATES: 1995-1996

OWNER: University of British Columbia

PROJECT MANAGER: Freda Pagani

ARCHITECT: Matsuzaki Wright Architects Inc.

STRUCTURAL ENGINEER: Read Jones Christoffersen Ltd.

MECHANICAL ENGINEER: Keen Engineering Co. Ltd.

ELECTRICAL ENGINEER: Robert Freundlich & Associates

LANDSCAPE: Cornelia Hahn Oberlander

PROJECT NOTES

SITE AND WATER

- **Water consumption:** Low-volume water fixtures used throughout building; composting toilets reduce water use by 264 gallons per day.
- **Sewage:** Water reductions allowed building construction without sewer connection. Subsurface wetland filters and cleans water naturally for use in irrigation.
- **Water collection:** A 8,000-gallon cistern collects rainwater to irrigate the landscape in summer months.

ENERGY AND ATMOSPHERE

- **Energy:** Consumes 23% less energy than ASHRAE 90.1, 40% less than average building standards.
- **Heat efficiency:** Double-glazed windows and exterior insulation reduce thermal bridging.
- **Power supply:** Due to minimal energy requirements, underutilized power from the adjacent Asian Centre building supplies all power needs without any new electrical service or transformers.
- **Utilities:** Waste heat from the campus underground steam infrastructure is captured and used to heat domestic hot water for the building.

MATERIALS AND RESOURCES

- **Timbers:** The building uses 75-year-old heavy timbers from the adjacent demolished armory for 90% of its structure, requiring recertification and recutting of the members but resulting in an impressive display of site-specific local recycling.
- **Reusing:** Builders salvaged and reused the main stair handrail, atrium guardrails, all doors, sinks, toilet accessories and some electrical conduits. The majority of non-structural steel and 100% of the bricks used in construction were reused from previous buildings.

INDOOR ENVIRONMENTAL QUALITY

- **Air quality:** Air pollutants are reduced through construction sequencing and material selection that includes eliminating carpet adhesives and using formaldehyde-free millwork and solvent-free finishes. Photocopy machines use direct venting.
- **Lighting:** Daylight and occupancy sensors reduce the use of artificial lighting.
- **Natural ventilation:** The building uses trickle ventilators to provide minimum ventilation in wintertime. Operable windows, cross and stack ventilation, and even the very shape of the building give occupants total control over their comfort level during all other times of the year.

C.K. CHOI BUILDING

In 1993, while designing the University of B.C.'s Institute of Asian Research, planning representatives held a design meeting, facilitated and led by the famous sustainable leader Bob Berkebile, to draw up new standards and goals for sustainable design, construction and operations. The result of that meeting is the C.K. Choi building, which is a regional gem of environmentally sensitive building. The C.K. Choi building has set a new standard in the Cascadia region for green building, most notably with its innovative water-use system.



The project was conceived during a period of rapid growth on the 75-year-old campus. The university planners and engineers had determined that such expansion requires significant and costly reinvestment in existing site infrastructure (utilities, etc.), unless a new paradigm could be created. This project changed the university's attitude toward buildings and their impact on the campus. The notion of a building "off the grid" was thus spawned.

FLUSHING WITH PRIDE

Of the many striking elements of the building which include the arced roofs (built to accommodate photovoltaic arrays and to reflect the architectural heritage of the asian culture, which is the focus of the research), old brick facades and expansive windows, people are most impressed with the toilets. By way of very inventive engineering, the Choi building isn't connected to Vancouver's sewer grid. The toilets require no water for flushing and compost all waste, sending it to a system of chutes and trays, and eventually a "gray-water trench." The "composting tea" is processed and cleansed by wood chips, red wiggler worms, microorganisms and plant roots.

KEEPING COSTS IN CHECK

Despite public approval of such enviro-friendly building projects, there is a common perception that green construction is much more expensive than the industry standard. The C.K. Choi building was constructed with the same dollars-per-square-foot budget as any other building on the UBC campus. While some materials are more expensive, others cost less. The design and construction team discovered that research and testing costs were often associated with using salvaged materials that would otherwise be free. At the same time, using innovations in ventilation and water use allowed the team to construct the building without an air-duct system or sewage connections at significant savings.

AWARDS AND HONORS

- 1996 BRITISH COLUMBIA EARTH AWARD, BUILDING OWNERS AND MANAGERS ASSOCIATION
- 1997 BUILDING AWARD OF EXCELLENCE, CONSULTING ENGINEERS OF BRITISH COLUMBIA
- 1998 "LIEUTENANT GOVERNOR OF B.C." AWARD OF EXCELLENCE, ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA (MATSUZAKI WRIGHT ARCHITECTS)
- 1998 AWARD FOR INNOVATION EXCELLENCE, ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA
- 2000 EARTH DAY TOP TEN AWARD, AMERICAN INSTITUTE OF ARCHITECTS COMMITTEE ON THE ENVIRONMENT

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