

Chancellor's Gym Expansion

BURNABY CAMPUS

Building Program

Student Services
Athletics

Building Area/ Cost

40,000 sq. ft./\$16 million

Development Manager

Phil McCloy, MAIBC

Prime Consultant

CEI Architecture

Consultant Team

Structural: Fast + Epp
Mechanical: Cobalt Engineering
Electrical: BLC Engineering
Cost: JBA
Landscape: PFS

Contractor/Construction Manager

Dominion Fairmile

Contract Administrator

Shopland Projects

Completion Date

October 2006

(Bleachers to be complete by Feb 2007)

Building Description

The 40,000 square foot gymnasium expansion at Simon Fraser University includes a gym with large spectator seating areas and a two-level fitness centre. The mechanical heating, cooling and ventilation systems for the new building were designed to maximize flexibility, occupant comfort and energy efficiency.

The project was constructed in two phases : Phase 1 included the spectator performance auditorium and sports program space; Phase 2 features a 12,000 square foot fitness centre aimed at becoming the premier university fitness club in Western Canada.

Design Concept

The unique 1,500 seat performance auditorium has upper seating tiers that feature reverse retraction that creates a partition, separating the jogging track from multi-functional spaces. Retractable lower seating and adjacent seating balconies create a vibrant horseshoe for event nights and performances complete with views to the mountains beyond. An upper level suite for sports and entertainment events and converts to sports program space during regular hours.

The fitness centre has generous glazing and is located immediately adjacent to the Terry Fox field to the south, so the fitness centre can provide fully integrated indoor and outdoor activities. Multi-use rooms in the existing gymnasium complements the new facilities.



Figure 1: Chancellor Gymnasium Expansion

Design Features

- 1,500 seat performance auditorium
- Fitness Centre
- Displacement ventilation
- Radiant floor slabs for heating and cooling



Figure 2 Lobby

Project Detail Description

Thermal conditions in the occupied spaces are controlled by the radiant heating and cooling floor slabs, leading to improved occupant thermal comfort. Heating energy for this system is supplied by the University's central plant. The University mandates that no mechanical (refrigeration cycle) cooling be used on campus where possible, so nighttime "free" cooling energy is provided by a closed-loop evaporative fluid cooler on the roof of the new building. This fluid cooler will discharge heat absorbed by the building's mass during the daytime to the cooler nighttime outdoor air. During peak cooling season, or in advance of a scheduled high-occupancy event, the building can be pre- or even sub-cooled. Extensive energy modeling (mostly using TAS) was required to ensure that the radiant slabs would be effective despite the variety of floor coverings used in the space.

Superior ventilation effectiveness is achieved through the use of a displacement ventilation system, which supplies 100% outdoor air to the space at low level and low velocity. All air-handlers are equipped with variable speed drives (VSDs) and controlled by CO₂ sensors to allow maximum flexibility based on varying occupancy conditions. The reduction of air volumes (by eliminating air-based heating and cooling and through the VSDs during low-occupancy) greatly reduces energy use and noise. Outdoor air is distributed to the main air-handlers through a central air-to-air heat recovery unit with a heat pipe, further improving energy efficiency.

Substantial energy savings are achieved through the combination of the following strategies:

- Effective use of thermal mass combined with radiant slab heating/cooling
- Building envelope that optimizes daylighting while minimizing solar gain
- Provision of cooling without mechanical refrigeration