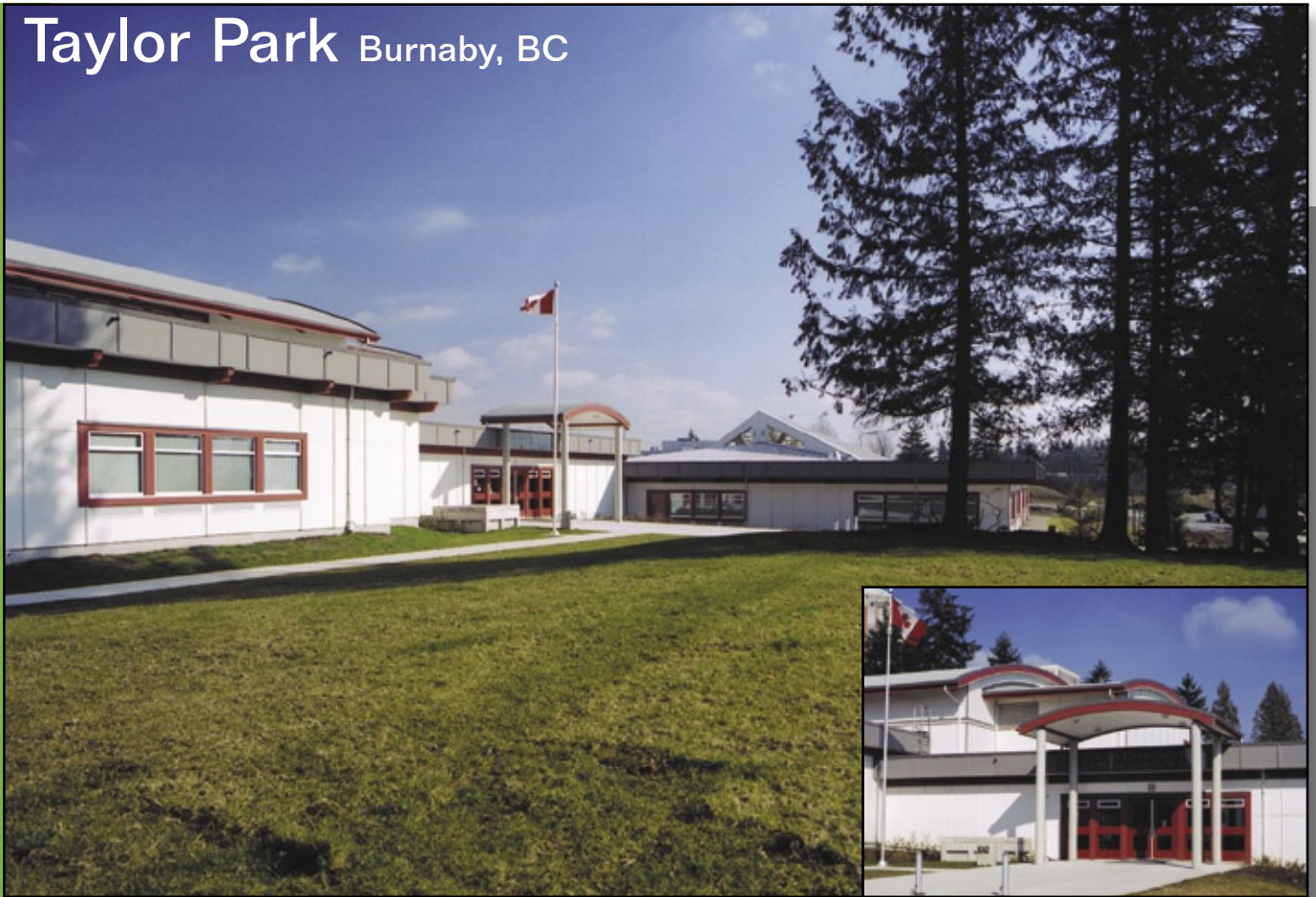


# Taylor Park Burnaby, BC



## BUILDING PROGRAM:

A one storey building with one administration block and two pods of classrooms, each pod encircling a covered courtyard. Opportunity for a third pod to be built at a later date.

## PARTICIPANTS:

|                        |                          |
|------------------------|--------------------------|
| Owner/tenant:          | School District # 41     |
| Architects:            | CJP Architects           |
| Structural:            | Pomeroy Engineering Ltd. |
| Mechanical/Electrical: | Earth Tech               |
| Energy:                | BC Hydro                 |
| Landscape:             | DMG Landscape Architects |
| QS / Cost:             | James Bush & Associates  |
| Contractor:            | DGS Construction         |

## BUILDING STATISTICS

|                     |  |
|---------------------|--|
| Address:            | 7590 Mission Avenue, Burnaby, BC   |
| Occupancy:          | 450 pupils K to 7; provision to expand to 600 pupils   |
| Floor Space:        | 3,225 m <sup>2</sup> :   |
| Budget:             | \$5,090,000 (total cost of construction including site)<br>\$3,789,375 (±\$1175/m <sup>2</sup> ) (building cost) |
| Completion date:    | April 19, 2004   |
| Start of Occupancy: | September 2004   |

## ENERGY STRATEGIES:

1. Energy simulations project an energy performance of 41.5% less than the Model National Energy Code for Buildings earning it a grant of \$43,560 from the federal Commercial Building Incentive Program. An independent commissioning agent will assess the building's performance one year after occupancy.
2. Energy efficient features:
  - Its innovative ventilation system cost approximately \$100,000 (25%) less than a standard HVAC system for this type of school.

- Each classroom pod encircles a covered courtyard heated primarily by solar heat and waste heat from the classrooms. The courtyards are used as air-space: they receive outdoor air. Low-static fans bring air from the courtyard into the classrooms through radiator grills located under the windows providing natural ventilation without the need for ducting.
- An air-to-air heat reclaim system is used for the gymnasium and multi-purpose room.
- A Direct Digital Controls (DDC) system allows for ongoing optimization of energy performance. The performance of the mechanical and electrical systems is tracked and monitored.
- "Point of use" water heaters are installed in the library and in the staff room to minimize domestic hot water piping and reduce energy losses.
- A "high temperature difference" hot water heating system uses a condensing boiler.
- Other energy-conserving features include thermally broken aluminum windows and demand ventilation with CO<sub>2</sub> sensors. Demand ventilation is achieved by the use of 3 separate fans per classroom which exhaust air when activated in response to temperature and CO<sub>2</sub> readings.

## WATER AND LANDSCAPE STRATEGIES

1. 50% of the site is covered with native vegetation requiring minimal or no irrigation.
2. Flowered grasslands connected to the park provides on-site wildlife habitat.
3. Low flush (6 Litre) toilets were installed.
4. Slow-release roof drains minimize the peak load on the municipal storm system.
5. Infiltration of stormwater is prevented to avoid potential leaching of contaminants from the adjacent former landfill.



### TRANSPORTATION STRATEGIES

1. The building is within walking distance of the Skytrain and buses.
2. The local, divided walking/bicycling trail was linked to on-site walking paths and extended right to the school's main entrance where bike storage is located.
3. The regional New Westminster/Burnaby/Vancouver bicycle connector is 100 meters north of the school.
4. The school shares parking with the nearby park to minimize its own parking spaces.

### MATERIALS STRATEGIES

1. High fly ash content concrete was used in the following proportion:
  - footings and foundation walls 40-50%
  - columns 30-40%
  - slabs 20 - 25%.

### CONSTRUCTION MANAGEMENT STRATEGIES

1. The GVRD Construction Waste Management Master Specification was used to divert waste from landfill through recycling and reuse of materials.
2. A large number of trees onsite were retained.

### WASTE MANAGEMENT STRATEGIES

1. An area has been designated for collection and storage of recyclables.

### INDOOR ENVIRONMENTAL STRATEGIES

1. 75% of the indoor finish materials were low-emitting. All wall and ceiling paints were water-based latex, low VOC.
2. Resilient tile or rubber was used for most floors. Carpet was installed only in areas that required acoustic treatment.
3. All rooms and 90% of the building floor area have exterior windows providing daylight. All classrooms access daylight from two sides and have dimmable ballast and occupancy controls for lighting level adjustments.
4. The building has few ducts or air plenums, limiting the build-up of contaminants.
5. CO<sub>2</sub> and methane sensors monitor the indoor air quality.
6. Large (4') overhang and translucent atrium roof were used to minimize glare.
7. All of the classrooms rely on 100% natural ventilation directly from outside with no ducting.
8. Full commissioning was performed by both the mechanical contractor and a separate, independent commissioning agent.

### COMMENTS ON DESIGN AND CONSTRUCTION PROCESS

1. What initially appeared to be a disproportionate amount of time expended by the design team to prepare for the charrette turned out to be time well spent. The school ended up being designed around the mechanical system rather than the other way around. This would not have happened if a traditional design process had been used.
2. The team learned to balance energy efficiency and other green goals with the school's program needs. For example, it would have been more efficient to build a two-storey building but being an elementary school it was requested that the building be one-storey so that children would have direct access to the outdoors.

### POST OCCUPANCY ISSUES

1. The covered courtyards were designed to be heated by solar energy (via a translucent roof) for benefit during the colder school months. The temperatures within the courtyards achieved in the summer were higher than anticipated. The schedule of the ventilation system will be modified during May/June to address this issue.
2. The light levels in the classroom were lower than found in classrooms of the past. Despite allowing for a period of adjustment for teachers and students the contractor had to return to the site to optimize light output in response to ongoing concerns.

### LESSONS LEARNED

1. A number of lessons have been learned through this process and this experience is being used in the construction of the next school for the School District 41. For example, motorized operable grills for fresh air intake in classrooms were eliminated to reduce capital cost. In retrospect, the change was counterproductive both from an energy performance perspective and comfort level. These will be incorporated in the next school design.
2. It is easier if the contractor is part of the process early and understands the goals of the project.

*"The Taylor Park Elementary School project helped to develop a "totally green" consciousness at CJP Architects and has influenced our approach to other projects. The firm has now developed green strategies on two additional projects - The Royal Inland Hospital Psychiatric Care Facility and Burnaby Southeast Secondary School. The former is anticipated to be the first hospital facility in Western North America to achieve a LEED "Gold" Certification."*

*Peter Rayber, Architect  
CJP Architects*