

McKim Middle School Kimberley, BC



BUILDING PROGRAM:

The school consists of two building blocks, one two-storey classroom block and one one-level block, connected to an existing gymnasium, housing the administration, a 500 seat theatre, a woodwork shop and a multipurpose room.

PARTICIPANTS:

Owner/tenant:	School District #6—Rocky Mountain
Architects:	MQN Architects
Structural:	Armstrong Engineering & Land Surveying Inc.
Mechanical:	Keen Engineering Co. Ltd.
Electrical:	Atwell Engineering Ltd.
Energy:	Keen Engineering Co. Ltd.
Landscape:	PSC Landscape
QS / Cost:	Concost Consultants Inc.
Contractor:	Mailey Developments Ltd.

BUILDING STATISTICS

Address:	689 Rotary Drive, Kimberly, BC
Occupancy:	350 Grade 6 to 8
Floor Space:	3,468 m ² :
Community space:	1,076 m ²
Budget:	\$5,666,207 (site development, design and construction) \$5,354,438(±1543/m ²) (building excluding theatre interior)
Completion date:	September 2002
Start of Occupancy:	September 2002

ENERGY STRATEGIES:

1. Energy simulations project an energy performance of 26% less than the Model Energy Code for Buildings earning it a grant of \$51,552 from the federal Commercial Building Incentive Program.
2. A variety of building orientations and configurations were reviewed to optimize siting and minimize peak loads.
3. The classroom block is oriented in E/W direction to optimize natural daylight and solar heat gain. Rooms requiring less daylight are located on the north side. The classrooms are equipped with light and motion sensors.
4. Exterior surface area and roof area are minimized.
5. The South elevation of the building envelope has a continuous air/vapour barrier at the perimeter but is independent of the structural system, thus minimizing thermal bridging. A continuous thermal envelope is provided around the building including the sub-surface foundation system.
6. Other features include high efficiency boilers with a minimum system efficiency of 95%, high delta T heating water system, pumps with variable speed drives, triple-glazed windows, high efficiency lighting, and overhangs shading south windows.



WATER AND LANDSCAPE STRATEGIES

1. The site between the school and Mark Creek was reclaimed and rehabilitated to provide green space.
2. The landscape consists of a series of berms through pathways. The fill required to build the berms was provided by other contractors in the community needing to dispose of fill from their work sites. The berms are covered with local species of grasses.
3. This replacement school has a smaller footprint than the original reducing impervious surface area and stormwater runoff.
4. Signs will be posted explaining the green features of the building.

TRANSPORTATION STRATEGIES

1. Bike racks are provided.
2. Parking requirements were reduced from 95 car-parking spaces to 57.
3. The school and the city pathways and bike trails are connected. The trails within the school grounds are designed to accommodate mountain bike uses.

MATERIALS STRATEGIES

1. Two major materials contain recycled content: gypsum wall board and acoustic ceiling tiles.
2. To use materials efficiently, the structure acts as the finish for some floors and ceilings.
3. A number of fixtures in the existing school were salvaged by the School District for use in other schools.

CONSTRUCTION MANAGEMENT STRATEGIES

1. All trees on the site were protected.
2. Topsoil removed during construction was reused on site.

INDOOR ENVIRONMENTAL STRATEGIES

1. All interior paints were water-based and low-emitting.
2. Non-fibrous finishes were used: the floor is concrete or sheet linoleum; walls are gypsum board, concrete block or Fiberglass Reinforced Plastic (FRP); and ceilings are exposed structure (metal) or acoustic panels.
3. There was no sprayed insulation or fireproofing.
4. Plenums are hard surfaces and do not expose supply air to artificial mineral or glass fibres.
5. The building is stepped back from the road improving safety and air quality in the school and reducing noise. The staff parking and bus drop off are located away from any air intake locations.
6. Operable windows were installed in all spaces. Full outside air is provided to each space via the mechanical system.
7. Daylighting is the primary source of light for over 50% of the spaces. Classrooms are south-facing for solar access.
9. Deciduous trees shade the building in the summer and allow for light and heat to penetrate the building in the winter.
10. Glare is reduced using angled steel shading devices and minimizing reflective surfaces immediately around the building perimeter.

WASTE MANAGEMENT STRATEGIES

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

COMMENTS ON DESIGN AND CONSTRUCTION PROCESS

1. The Integrated Design Process (IDP) for this project involved a larger number of people and, being new to the team, took more time than the traditional process. The IDP, however, allowed participants to think outside the realm of their own area of expertise and the school's design reflects this collective input well. IDP led to a whole building design rather than to an element by element design.
2. This approach has affected the way the School District manages renovations on its existing buildings. The School District now takes into account the orientation of the rooms before making decisions on lighting and heating systems.

POST OCCUPANCY ISSUES

1. School staff and students had to develop strategies for managing the light motion sensors in the classroom and the offices, for example, when students were writing an exam.
2. There were some problems during May/June of the first year of operation when the classrooms on the South side became too hot. The trees in front of those classes had not yet reached proper height to provide adequate shading.

LESSONS LEARNED

1. For remote projects, there is an extra cost to getting all of the participants present for additional design meetings.
2. It is important to keep the design as simple as possible and to ensure that the systems that are put in place are easy to operate and maintain.
3. Specifying products that are easily replaceable or locally available is particularly important for remote areas. This is not always the case for green products. For example, triple glazed windows are produced in batches, but not necessarily on a regular basis, making the delivery time potentially longer.

"I would recommend the integrated design process to anyone building a new school. We have seen, during this process, the cost consultant and design team working together to utilize systems and materials that would achieve the best life cycle, social and environmental performance. The process also provided the team with a better understanding of the interactions between the various elements of the building and therefore allowed the team to design the building as a whole rather than element by element. Since then we have been able to apply these principles when planning and renovating our existing buildings to increase their performance."

**Steve Jackson, ASCT, Director of Operations
ROCKY MOUNTAIN SCHOOL DISTRICT #6**