

AIBC/APEGBCSUSTAINABILITY 2001 EXHIBITION BC GAS COASTAL FACILITIES PROJECT

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PROJECT TEAM

Architect:	Musson Cattell Mackey Partnership Architects Designers and Planners
Structural:	Read Jones Christoffersen Consulting Engineers
Mechanical:	Keen Engineering Ltd
Electrical:	Earth Tech Canada Inc
Landscape:	Durante Kreuk Landscape Consultants
Civil:	Citiwest

PROJECT DESCRIPTION

The BC Gas Coastal Facilities Project comprised five buildings on two sites; two buildings on the Lochburn site in Burnaby and three buildings at the Surrey site on the Fraser Highway. This exhibit highlights the largest single building, the Operations Centre. The other buildings although much smaller also follow most of the same principles.

The Operations Centre comprises 170,000 square feet. The other two buildings are a stores annex of 5000 square feet and a 30,000-square-foot training center. On site parking totals 600 cars, of which 126 are accommodated under the Operations Centre.

The buildings are oriented to maximize useable site area, break up large floor plates and minimize exposure to low-angle east and west sunlight. Angled heat-absorbing sun screens minimize heat gain from those exposures.

Direct southern sunlight is shaded and light shelves are introduced to maximize indirect daylighting. North glazing is also maximized to take advantage of diffused daylighting.

Opening windows in conjunction with atriums provides natural ventilation. Four atria punctuate the main internal pedestrian spine and utilize the natural stack effect to enhance natural ventilation. Atriums also provide identity to user functions, increase daylight penetration and promote vertical circulation with open stairs.

Power, data cabling, and supplemental air-conditioning are supplied through raised floors. Indirect lighting is used to reduce glare on computer displays.

The project represented Canada at Green Building Challenge 2000 as one of several posters exhibited at this major international event in Maastricht last October.

Refer to Keen and Durante Kreuk companion exhibits for full descriptions of mechanical/energy and landscape/site design issues.

I. SUSTAINABLE SITES

The site is located at the junction of 168th Avenue and the Fraser Highway in Surrey, BC. BC Gas has owned the site since the '50's. Several small buildings were operating on the site. These were deconstructed to make room for the construction of three new buildings. Erosion and sediment control measures were incorporated during construction, as was the construction waste management program. Hauling of excavated material off site was minimized through the incorporation of landscaped berms on the site. A fueling station for natural gas vehicles is part of the design and will be shared with local emergency vehicles. Refer to the Durante Kreuk exhibit for full description of the broad range of environmental site design features.

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II. WATER EFFICIENCY

The provision of one level of parking under the post-disaster Operation Centre freed up portions of the site for development as a campus-like setting that incorporates advanced systems of on-site water management. These features include bio-filtration in surface parking areas, collection and re-introduction of roof storm water, emergency water storage in a pond and selection of low-maintenance indigenous species. Low flow fixtures further reduce the project's reliance on potable water.

III. ENERGY AND ATMOSPHERE

The Operation Centre and the Education Building both comply with CBIP – early goal setting enabled the Operations Centre to run at a projected 63% of the Model National Energy Code (50% improvement over the CBIP threshold). In order to verify performance, commissioning protocols were specified. Optimization of energy performance was achieved through the computer modeling techniques during the design phase. Orientation and massing of the buildings, natural ventilation, atriums, access flooring and external sunshades and internal light shelves all contribute to make this a very advanced and integrated design. Exposed ceiling slabs are painted white to provide bright, reflected light from indirect luminaires. The slabs are used to store heat through the day that is flushed out at night - reducing the cooling load for most of the year. Refer to the Keen exhibit for full description of the range of energy and environmental engineering features of the project.

IV. MATERIALS AND RESOURCES

About 800 tonnes of fly ash were incorporated into the massive concrete structure, avoiding substantial use of cement and thereby reducing local CO₂ emissions associated with cement production. The project was one of several case studies in the development of the GVRD's Ecosmart concrete program. The final report can be accessed at the following website: <http://www.ecosmart.ca/use/reports/index.asp>.

Materials having high levels of recycled materials and low levels of volatile organic chemicals were specified. Many materials were eliminated altogether – for example the atrium shear walls are exposed architectural concrete and the atrium floors are polished stained concrete.

Recycling spaces are included in the design to facilitate ongoing recycling by the building occupants.

V. INDOOR ENVIRONMENTAL QUALITY

Natural ventilation provides for fresh air and low energy operation; CO₂ monitoring is provided in this non-smoking building. Low VOC materials paints and sealants have been provided. High levels of occupant control combined with very high daylight levels provide occupants with excellent work environments.

Musson Cattell Mackey is committed to environmentally responsible design and is a member of the US Green Building Council, the Sustainable Building Canada Committee, the AIBC Energy and Environment Committee, APEGBC Sustainability Committee and the Canadian Standards Council subcommittee on materials labeling.