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**School Plant Officials
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HERITAGE WOODS SECONDARY SCHOOL:

Educational facility planning with a long term view



by Gregg Brown



KMBR General Staff.

Educational facility planning, at its best, strikes an optimal balance between creating the ideal learning environment and minimizing operational costs in the long term. The design of Heritage Woods Secondary School in Port Moody attempted to do just that, and the results have already attracted considerable attention.

The design team was lead by Killick Metz Bowen Rose Architects Planners (KMBR), a firm well-known in B.C. for school design.

School District 43 Coquitlam selected the design team, in part, on their ability to achieve a high standard of “green” design. With this encouragement KMBR registered the project with the US Green Buildings Council making it the first LEED (Leadership in Energy and Environmental Design) registered public school in B.C.

Innovation took many forms in the design of this 1200-student facility, which opened in the fall of 2004.

The building – jointly developed by SD 43 and the City of Port Moody – is situated on a steeply sloping site (a 33 meter fall from top to bottom!). Large platforms were needed to construct a \$2M track, a \$1.5M synthetic turf field and a \$600,000 baseball field. The integrated approach to site development has many benefits: less land is needed, parking can be shared, and the students have the use of outdoor recreational facilities that most schools can only dream of.

Site planning also had to take into account two creeks flanking the site, stringent storm water management requirements, and the financial and environmental necessities of balancing the enormous earthwork cuts and fills. The design took advantage of the major earthworks by placing 17 kilometers of piping required for a ground source heating and cooling system under the track and field - much cheaper than having to drill vertical wells.

The architects designed a very compact 3-storey building stepped into the slope of the site. Taking advantage of the south-facing slope, the design uses a variety of means to capture and control daylight entering the building. KMBR took scale models of the building to the Seattle Lighting Lab to accurately simulate the daylighting at different times of the year, and used the results to improve the design. The building occupants appreciate this aspect of the design. According to the principal, Doug Sheppard, “The architects have done a wonderful job of bringing in the natural setting...and the tremendous amount of light.”

The heart and lungs of this building take the form of a dramatic and attractive 3-storey atrium. The atrium does many things for the school. It is a multi-purpose common gathering space for students, served by a cafeteria, and adjacent to the library and a student store. It is the circulation hub of the school. Several internal classrooms get their daylight and views from the atrium, which is flooded with light from large clerestory windows. By facing inward, these classrooms also experience much less heat loss. Warm air naturally rises in the atrium. Air is pulled in and natural ventilation is achieved by opening windows around the building. At the top of the atrium, mechanical heat recovery units extract the heat using heat exchangers, and put the heat back into the building air supply.

In the atrium, near the school entrance, the design team has experimented in using the building as a learning tool. A computer station with a 19” touch screen display has been set up in an alcove and is programmed to allow students to see, in real time, the dynamic workings of the building, from the temperature of the outdoor supply air to the performance of the heat recovery units. Information about the sustainable design features in the school is also displayed on this computer, so that students can better understand their built environment and the responsibility we all have in minimizing our environmental “footprint.”

Energy-saving measures abound in this building. For starters, the building envelope is thermally efficient. Continuous spray foam insulation acts as a combination air barrier, insulation and vapour barrier, with no thermal bridging. In addition to geothermal heating/cooling and heat recovery, fifty per cent of the peak heat load is handled by high efficiency boilers. Energy efficient lighting and controls minimize



KBMR General Partners.



Heritage Woods Secondary School.

PHOTOS COURTESY OF
ROBERT STEFANOWICZ.

energy use. Direct digital control (DDC) systems further optimize energy and water consumption, and enhanced building systems commissioning helped ensure that everything was running optimally when construction was complete. A measurement and verification program will extend into the future to make sure the building systems perform as intended and receive timely “tune-ups.”

Energy modeling has been an important tool for this project. The building is expected to perform 55% better than the Model Energy Code, garnering a full CBIP rebate, 9 LEED points for energy efficiency, and annual savings in the order of \$52,000 per year (as compared to the ASHRAE 90.1 baseline).

Architecturally, the building looks different than any other school in the province. The stepped form of the building, with extensive south-facing glass and sun shades, expresses a well-considered response to the site. Unpainted concrete, both tilt-

up and cast-in-place, provides durability and a robust civic presence. Clear finished fibreboard (MDF), used for wall protection and acoustical slats, gives the school interior the warmth of wood.

One end of the building is anchored with a 325 raked seat theatre, which from the outside is expressed with a sweeping curved roof. Since the Ministry of Education does not specifically allocate space for performance venues in schools, it required considerable creativity on the part of the planning team to make the theatre a reality. By cobbling together space from various parts of the school program, the theatre became feasible without adding to the project size or budget.

The project was built within the Ministry of Education’s normal unit rate for construction. The 11,770 m² building cost \$1140 per square meter, a bargain compared to present-day construction costs.

The project has received considerable attention. For its green design innovations, the project has won two ASHRAE awards and has become a featured case study for the provincial government’s Green Buildings BC program. The Council of Educational Facility Planners International featured the project in a one-day seminar last year entitled “Innovation and Economy.” The Design Quarterly and ArchitectureBC magazines have run cover stories about the project.

Most importantly, the students and staff in Heritage Woods have responded enthusiastically to the design, and the School District is delighted about the energy savings and operational benefits. Not only has the facility created an excellent learning environment for students, but it appears to have inspired other school officials and designers who wish to create high performance schools.

Gregg Brown MAIBC, LEED AP, has been a partner at KMBR Architects Planners since 1991. He has the REFP (Recognized Educational Facility Professional) designation from the Council of Educational Facility Planners International (CEFPI), one of 9 REFP’s in Canada. Gregg is an officer in the CEFPI BC Chapter Executive, and is the Chair and founding member of the AIBC Educational Facilities Committee.

For more information about the project and KMBR see www.kmbr.com; telephone : 604-732-3361; fax: 604-732-1828. □



Night view of atrium.

BUILDING FUTURES:

Killick Metz Bowen Rose Architects Planners Inc.

Behind this magazine's cover story about Heritage Woods Secondary School is another story, a story about the architects who designed that exciting facility.

The firm Killick Metz Bowen Rose Architects Planners (KMBR) is a Vancouver-based firm of 32 people lead by 5 partners. Founded in 1958, the firm has recently received considerable attention for creating architecture that is rigorously modern and yet grounded in the community and environment where it is located.

From KMBR's origins in Dawson Creek as the most northerly located firm of architects in Canada, and through the leadership and innovation of the founding four partners, the firm went on to open branch offices in Vancouver, Whitehorse, Grand Prairie and Abbotsford. Experience was gained with almost every imaginable building type, and a diversity of project types continues to this day.

Recent projects by KMBR range from a gas bar for a First Nations client in Moricetown that won the 2006 WoodWORKS Architect Award, to a 22-storey residential tower being constructed in New Westminster, to a pair of instructional buildings soon to begin construction at the College of the Rockies in Cranbrook. The new Salmon Arm Courthouse and District Offices is a striking joint-use facility that KMBR designed in association with Bernd Hermanski Architect.

For over 40 years KMBR has maintained the distinction as one of BC's most successful architectural firms specializing in school design, and over this time KMBR has served over 40 School Districts. The firm continues to bring fresh ideas and creativity to the public and private school sector. Notably, KMBR are the architects in the design-build team that were awarded the G.W.Graham Middle/Secondary School in Chilliwack. KMBR is the prime architect for the Penticton Secondary



Night view of front entrance of Heritage Woods Secondary.

School (in association with Bevanda Architecture), which will integrate the original 1912 heritage building into the new facility (to be tendered this summer). KMBR is also the architect for the recently tendered Sutherland Secondary School in North Vancouver, which has commenced construction.

KMBR's success and reputation are built on several beliefs and core values that guide their work. Responsive service in all phases of the work is a basic trait that the partners foster among all KMBR staff. The firm has a passion for understanding each client's unique needs and objectives, believing this to be the only path to success. On the practical side, KMBR has focused on maintaining a strong reputation among clients for budget-conscious "value-for-money" design, and among contractors for well-detailed and thorough construction documents. As evidenced by

the Heritage Woods Secondary School, a strong interest in environmental issues, sustainable design, and optimizing life cycle costs is now, more than ever, a major driver in their work. And finally, KMBR is intent on producing work that marries beauty and functional integrity into an architecture that belongs.

Along with a growing reputation for design in other building types, KMBR intends to remain a leader in educational facility planning, and to that end takes full advantage of the professional development opportunities organized by the Council of Educational Facility Planners International (CEFPI). In fact, of only three people in British Columbia who have attained the CEFPI's Recognized Educational Facility Professional (REFP) designation, two are KMBR partners - Cristina Marghetti and Gregg Brown. □



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