

WOULD YOU LET KIDS DECIDE HOW TO DESIGN YOUR NEW BUILDING? RICHMOND SCHOOL DISTRICT #38 DID

Brighthouse Elementary

Photo: Nic Lehoux / Courtesy Perkins+Will

HOW SAMUEL BRIGHOUSE ELEMENTARY SCHOOL WAS BUILT TO THE HIGHEST STANDARDS OF ENERGY EFFICIENCY, SUSTAINABILITY AND BEAUTY

Sounds a bit dangerous, doesn't it, letting school kids help determine the design of their new elementary school? Yet that's exactly what happened with Samuel Brighthouse Elementary School in Richmond, BC. It turns out that what kids want is good natural light, fresh air – and sustainability.

Early in the design process, Vancouver architectural firm Perkins + Will went directly to the students who would be using the new school to find out what was most important to them. The students drew pictures and made videos to illustrate the qualities they wanted in their school, and the design team carried their ideas – along with feedback from parents and teachers, the school board, the City and members of the surrounding community – into the design process. The students' input specifically inspired the light-hearted, rippled roof form, the use of colour inside and large, floor-to-ceiling windows.

"It was a very collaborative design process," says Tracy Blagdon, Manager of Energy and Sustainability for Richmond School District #38, "and the students were right there in the middle of it. The school district decided early on that it wanted Brighthouse to be a teaching tool, to show how environmental stewardship could work, but we also wanted it to be something everyone felt they were a part of. And I think we really succeeded: it's kid-friendly, it fits in the neighbourhood, it's incredibly energy efficient and sustainable and it's beautiful."

HOW BEAUTIFUL, ENERGY EFFICIENT AND SUSTAINABLE?

So beautiful, Perkins + Will won a Lieutenant-Governor of British Columbia Award in Architecture for it in 2012; so energy-efficient, Richmond School District won BC Hydro's 2012 Power Smart Excellence Award for New Construction; and so sustainable it's one of the lowest carbon-emitting schools in the country. "During the shoulder season," says Tracy, "Brighthouse sometimes operates using no carbon-based fuels at all."

Built to accommodate about 500 students, the new school is a two-storey, 4,777-square-metre structure with two wings connected by a central atrium. There is also a shared community garden, outdoor courtyards, a neighbourhood learning centre with evening adult literacy courses, and green roofs on the kindergarten classrooms that can be seen from the second-level atrium space.

ENERGY CONSERVATION AND AWARD-WINNING DESIGN

Energy-conservation measures built-in to Samuel Brighthouse Elementary School include:

- A geo-exchange system for heating, where water circulating in tubes below the school yard captures heat from the ground and redistributes it to each classroom through an in-floor heating system
- A mixed-mode ventilation system, where air passes into the school spaces through trickle vents (which operate automatically) and windows, then transfers into the atrium where energy is recovered before being exhausted to the outside
- Solar hot-water collectors located on the library roof, which provide hot water to all the school's hot water taps
- Daylight harvesting through lighting control systems, combined with solar shading, and triple-glazed classroom windows.

J.S. Tessier, Associate Principal of Integral Group (formerly Cobalt Engineering), says “of all the schools we’ve done in the past, nothing comes close to Brighthouse – the atrium, the light, the space. Most schools have low ceilings, and they’re dark. This one, you walk in and it’s light – the atrium doesn’t need electric light at all, even when it’s cloudy. And it feels fresh all day. The teachers love it, the students love it – they’re not tired at the end of the day.”

SUCCESS SECRET: ENERGY MODELING

One of the secrets to the success of the design, and to its extremely high energy efficiency, says J.S., is the fact that the design team completed an energy-modeling study as part of BC Hydro’s New Construction Program. The study is a simulation of how much energy a building day and night will use throughout a year. Designers can compare various lighting, heating and cooling systems as well as windows, roofing, wall and other products, and even look at how the building is situated on the site, to determine the most energy-efficient design.

“We were able to model different solutions,” he says, “and look at every little measure – what happens if we put in a radiant floor, for example, or triple glazing instead of double – and then show the client the results. We could show that it is worth the money to install these measures, because the long-term savings in energy are really worthwhile.”

The original energy-modeling study showed that, by building-in a range of energy-conservation measures, the new Brighthouse Elementary could use as much as 30 per cent less electricity than a comparable school. In fact, says J.S., since the school opened in March 2011, “it has been performing much better than predicted. We’re very happy with it. The systems are operating well.”

For Tracy Blagdon, one of the best energy-saving features is the blue light indicator on the classroom windows. “I love this,” she says. “We know the students love fresh air, and this feature puts the control in their hands: the blue light goes on when the environmental conditions are right for opening the windows.” She also loves the fact that the new school is more than just an attractive space.

“It was important for it not just to look pretty,” says Tracy, “but to be a place where students, teachers and neighbours experience sustainability every day. It shows that sustainability is possible even within a limited budget. Funding for new schools is definitely not unlimited, but with a great design team and the help of incentives from BC Hydro, NRCAN and others, we accomplished this great place for learning.”

ABOUT THE NEW CONSTRUCTION PROGRAM

The New Construction Program provides financial incentives for new commercial, institutional and multi-unit residential buildings and major retrofits. If you qualify, BC Hydro will fund up to 100 per cent of an energy modelling study that can be used towards your LEED certification and to apply for FortisBC capital incentives (some restrictions apply).

To find out more, visit bchydro.com/construction or call 1 866 522 4713.

ANOTHER SUSTAINABILITY HIGHLIGHT

- Brighthouse Elementary School conserves water and manages storm water through the use of low-flow fixtures and site grading that directs run off into a series of constructed wetlands.
- This helps keep the playing fields dry in the winter and creates a natural habitat that attracts native wildlife.



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