

## SUSTAINABILITY BUILDING BRIDGES

**W**ith hand-applied clay-plaster finishes, raised-relief botanical detailing and columns of debarked tree trunks supporting the living roof of the outdoor stage, the new Madoc Performing Arts Centre, about an hour's drive east of Peterborough, Ont., is a work of artistic beauty. But it's what's inside that counts.

Beneath this earthy exterior is a net-zero-energy building with a network of geothermal and photovoltaic technologies. No fossil fuels, no greenhouse gases, no toxic materials. And it was constructed by students in just 20 weeks.

"It doesn't take rocket science or huge investments to build sustainably," says Chris Magwood, who teaches the one-of-a-kind Sustainable Building Design and Construction program at Peterborough's Fleming College. "It takes a bunch of college students and some understanding of what's possible."

While a growing number of Canadian schools teach elements of sustainable building or offer workshops on particular techniques, no other program trains



students how to construct a building from start to finish using natural, minimally processed and locally sourced materials, such as hemp-straw bales, along with state-of-the-art mechanical systems.

Students spend two weeks in class and the remaining 18 weeks on-site juggling construction work, lectures and assignments. It's a three-semester, 45-week program crammed into just five months, running from April through August.

Magwood realized the need for a practical building program in 2004, after his straw-bale construction company received 100 applications for an unpaid apprenticeship. He pitched the idea of the program to Fleming College, and a year later, his first class of students built Haliburton, Ont.'s 4Cs Food Bank and Lily Ann Thrift Shop. More public buildings followed, including a sustainable education centre and museum. This year's project, the Camp Kawartha Environment Centre at Peterborough's Trent University, promises to be the greenest building yet.

Despite its physical and academic intensity, the program attracts a broad range of students from varying professional backgrounds. But it isn't designed to train them for any one profession, says

**College students (LEFT) worked for 20 weeks last summer to build a net-zero-energy building outside Peterborough.**

**Tree trunks support the outdoor stage of the Madoc Performing Arts Centre (ABOVE), a project of the Sustainable Building program at Fleming College.**

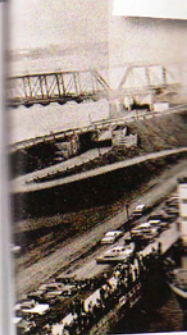
Magwood. It's about exposing students to options for sustainability-minded construction and encouraging them to find their niche.

"You can make your own job or continue with more training," says 2006 grad David Elfstrom, 36, now president of Toronto-based Elfstrom Engineering and a consultant on this year's student project. "You see all the techniques in practice and learn the terminology on the ground. That gave me a good starting point for everything that came later. Having hands-on construction experience is absolutely critical."

Magwood recently got the go-ahead for a second program, which will teach students environmentally friendly renovation skills. Residential and commercial dwellings contribute more than a third of Canada's greenhouse-gas emissions, so there's a need for green graduates to continue to break new ground.

"I think of it as an interesting problem," says Magwood. "How do we house ourselves without wrecking the planet forever? A college student can have as interesting an impact as a 50-year-old design engineer. It's an exciting time to get into this field."

Fiona Wagner



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