



**The Engineering Design Studio @ Philadelphia University**  
green materials, sustainable design resource, community outreach

SUMMER 2003

## Spurring Green-Building Industry in Southeastern Pa.

The green-building industry is a burgeoning economic force requiring the development of new materials, new construction techniques, innovative building technologies and a new kind of work force. To meet this evolving demand, Philadelphia University partnered with Ben Franklin Technology Partners of Southeastern Pennsylvania (BFTP/SEP) to secure a two-year grant from the Commonwealth to create The Engineering and Design Studio @ Philadelphia University. The Studio is an interdisciplinary research center focusing on green materials, sustainable design and community outreach.

Designing for sustainability is a complex process requiring different disciplines to transcend their artificially constructed boundaries in order to solve difficult technical and aesthetic challenges. As a response to this complexity, The Studio is directed by Chris Pastore, a textile engineer whose primary focus is green materials; and Rob Fleming, a registered architect, who is developing the sustainable-design resource aspect of The Studio.



Green building design funded by Sustainable Development Fund.

Studio members are drawn from a mix of University faculty, representing disciplines such as Textile Engineering, Architecture, Design, Business, Biology, and Chemistry. Specially-focused teams work on specific consulting projects or conduct grant-based research on projects ranging from the development of fly-ash cement to helping local architecture firms design green buildings.

Located in the Roxborough/Manayunk section of Philadelphia in a restored 1876 textile mill, The Studio's unique setting reflects its mission by adaptively reusing an old stone structure and by investing resources in a Philadelphia neighborhood. The 2,200 square-foot Studio space was chosen specifically to demonstrate age-old principles of sustainable design that include high ceilings, tall windows, thick walls and natural wood floors. The Studio's

location is fitting considering the prevalent use of textiles in the newly renovated space. From floating wall dividers and decorative panels to innovative lamp and window shades, members of The Studio are attempting to explore the potential of textiles in sustainable design. In addition, The Studio is designing a 100 percent-sustainable desk made from formaldehyde-free Medite2 board, Forbo desk covering made from linseed oil, and a structure made from recycled steel and aluminum.

Among their many projects to date, Studio members have helped establish the Delaware Valley Green Building Council, conducted professional-development courses for architects and engineers in advanced sustainable design, and are developing low-cost, spray-on insulation systems for exposed walls of city row

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A well-attended reception in October 2002 marked the opening of The Engineering and Design Studio.

## Sustainable Design Resource Center Opening Sept. 2003

Here is where you can learn everything you need to know about sustainable design — from the Leadership in Energy and Environmental Design (LEED) rating system to information on rapidly renewable materials, to samples of the latest green materials. The Studio is collaborating with the Delaware Valley Green Building Council to stock, organize and maintain the Resource Center shelves with the latest materials needed to support the sustainable-design process. Through a generous grant from the Sustainable Development Fund, the Center will be open to the public eight hours per week, beginning in Sept. 2003. Directions and contact information can be found in this newsletter. Hours of operation will be posted on The Studio's web site [www.PhilaU.edu/thestudio](http://www.PhilaU.edu/thestudio).

### More Continuing Education Courses on the Way

#### COMING IN 2004:

- Intro to Sustainable Design
- Energy Modeling
- Daylight Analysis
- Interior Ecology
- Green Design/Build
- Sustainable-Design Studio

For more info check our web site [www.PhilaU.edu/thestudio](http://www.PhilaU.edu/thestudio)

## Low-cost, Spray-on Insulation System for Exposed Walls of City Row Houses

Philadelphia University is developing a low-cost insulation material to convert newly exposed residential party walls into durable exteriors as part of the City of Philadelphia's Neighborhood Transformation Initiative. Tom Twardowski of Philadelphia University's School of Textiles and Materials Technology is the principal investigator. Members of the multi-disciplinary team include Rob Fleming and Christopher Pastore as well as student researchers, Elizabeth Gentile and Melissa McKinney.

This sustainable-building material demonstration project proposes an inexpensive, easy-to-apply, thermal-insulation system for homes. The key component of one of the proposed solutions is an innovative sprayed-on material comprised of cellulose-based reinforcement encapsulated with foamed polymer, in which the cellulose is reclaimed waste.

The project incorporates five critical elements addressing target requirements:

- A substantial improvement in long-



Foam with shredded money reinforcement. The Federal Reserve typically burns used money. In this case the money is shredded and reused as fiber reinforcement.

energy  
 city in the affected housing  
 oment of an energy-saving  
 l with substantial reused or sus-  
 agricultural content;  
 g opportunities through union  
 personnel and apprenticeship  
 programs, thus  
 potentially expanding  
 local employment;  
 • Product commercializa-  
 tion, market transformation  
 and local economic develop-  
 ment opportunities; and

- Technology transfer to other urban areas in the Commonwealth and across the country through *Rebuild America* and other peer-to-peer exchange programs.

The project team includes individuals from the City of Philadelphia Municipal Energy Office, Department of Energy *Rebuild America*, Pennsylvania Department of Environmental Protection, Neighborhood Transformation Initiative and The Engineering and Design Studio @ Philadelphia University.

## SPURRING GREEN-BUILDING INDUSTRY CONTINUED FROM PG. 1

houses (see story above). A highlight of the partnership with the Green Building Council has been the development of the Sustainable Design Resource Center, which will open Sept. 2003 (see story at left). The Studio also seeks to bring federal research dollars to the southeast region and has submitted a proposal to the National Science Foundation to develop an interactive design tool to visualize the environmental impacts of suburban growth. A spin-off of the project will be an educational video game for high school and college students.

The Studio has received federal funding from the National Textile Center (NTC) to study the role of sustainable carpeting in increasing carpet-industry competitive-



The Space: lessons in sustainable interiors.

of fabric structures to  
 more about The Studio visit

eastern Pa., visit

## Sustainable Carpet as a Competitive Advantage

An interdisciplinary team is investigating the competitive advantages of sustainable practices in the U.S. carpet industry. The team is led by principal investigator Dr. Cathy Rusinko of Philadelphia University's School of Business Administration, and includes architects Rob Fleming and Susan Frosten; Chris Pastore; and John Pierce, Psychology.

The goal is to improve competitiveness in the textile industry through use of sustainable practices. More specifically, the project examines which sustainable practices (e.g., solid-waste recycling, reduction of material consumption, use of rapidly renewable materials, etc.), can help to achieve certain goals (e.g., decreased cost, increased quality, increased sales, increased revenues, etc.). To accomplish this, the team will: (1) develop a first-of-its-kind model to predict which sustainable practices result in which competitive goals; and (2) build a

database of sustainable practices and outcomes in order to test the model empirically.

These research objectives were developed through visits and personal interviews with leaders in the carpet industry. The carpet industry is the focus of this study since it has been aggressively and publicly pursuing sustainable practices for more than ten years. Interviews with representatives of C&A Floorcoverings, J&J Industries, Milliken, and the Carpet and Rug Institute (CRI) confirmed the need for empirical research on sustainable practices as a source of competitive advantage in the carpet industry. However, the outcomes will be applicable beyond the carpet industry, and will provide lessons for the entire textile industry.

This program is funded by the National Textile Center through the Department of Commerce. For more information, email Dr. Rusinko at [rusinkoc@PhilaU.edu](mailto:rusinkoc@PhilaU.edu).



*Horizontal and vertical shading devices protect interior spaces from hot, summer sun, thereby greatly reducing cooling loads for the building.*

## Friday Architects Gets Assistance in Designing Community Center

Friday Architects has been successfully designing buildings for years. When the opportunity arose to design a LEED-rated community center in Northern Liberties, the architects turned to Philadelphia University for assistance. BFTP/SEP provided funds to offset the cost of the University's involvement in the project. Services provided included education, design charrette facilitation, energy modeling, LEED analysis, and environmental visualization. The project includes an innovative double-skin glass wall that generates warm air in the winter and vents hot air in the summer. A green roof was proposed to control storm water run-off and provide cooling in the summer. The project, when constructed, will be one of the first LEED-rated buildings in Philadelphia.

### Local Cement Manufacturer Benefits from Studio Expertise

*Creative Industries developed interior surfaces and a "food altar" for La Croix Restaurant at Philadelphia's Rittenhouse Hotel. The Studio helped develop cement products formed from fly ash, a waste product of coal combustion. Pictured are Chris Pastore, left, and Harvey Leis, president of Creative Industries, in front of the "food altar."*





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Technology PARTners  
Southeastern Pennsylvania



**Other Ben Franklin Product Development engagements include:**

- Development of sustainable high-performance storage systems for Old Mill Storage in Philadelphia
- Development of composite-raised floor/wall/ceiling system for Point B Design in Philadelphia
- LEED-application assistance for W.S. Cumby in Swarthmore, Pa.
- Visualization and feasibility studies for Queen Village development in Philadelphia

**For information contact:**

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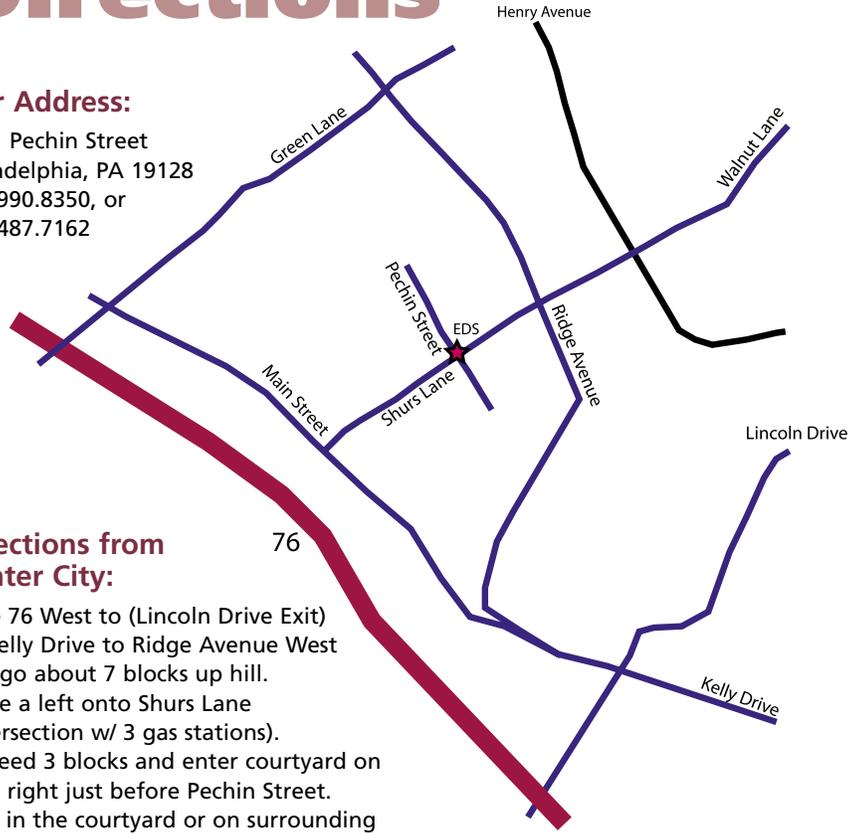
Fax: 215.487.7163  
[www.PhilaU.edu/thestudio](http://www.PhilaU.edu/thestudio)

*This newsletter was printed with natural soy inks on 100% recycled paper.*

# Directions

**Our Address:**

4111 Pechin Street  
Philadelphia, PA 19128  
215.990.8350, or  
215.487.7162



**Directions from Center City:**

Take 76 West to (Lincoln Drive Exit) or Kelly Drive to Ridge Avenue West and go about 7 blocks up hill. Make a left onto Shurs Lane (intersection w/ 3 gas stations). Proceed 3 blocks and enter courtyard on your right just before Pechin Street. Park in the courtyard or on surrounding streets if the courtyard is full.

The Engineering Design Studio @ Philadelphia University



ADDRESS CORRECTION REQUESTED

School House Lane and Henry Avenue  
Philadelphia, Pennsylvania 19144-5497



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