NEWS & INFORMATION FOR THE CONSTRUCTION TEAM

Building Success

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Green Design Makes Good Business Sense

An inescapable fact of doing business can be summed up in the point of view that, "You can pay on the front end, or you can pay on the back end, but either way you'll have to pay." For new building construction, good planning and green design on the front end can substantially reduce back end costs and provide other cost benefits as well.

Most of a building's costs over its expected life – 60 to 85 percent according to the National Research Council – are wrapped up in its operating expenses, while the initial construction cost accounts for just 10 percent or less. With these numbers in mind, it makes good business sense to minimize operating costs by designing and building green.

It's not just an issue of operating costs versus construction costs that makes environmentally sustainable design a wise business decision, however. In an article by Steven Morton in the November 2002 issue of *Building Operations Management*, he argues that one has to look beyond the traditional project cost model to understand the value of green design.

More than Energy Efficiency

Morton, Senior Vice President and Director of HOK Consulting, uses a relatively simple equation to determine a building's value: real, or life cycle costs, + opportunity costs = building value. Real costs include construction costs plus operating costs: heating, cooling, lighting, maintenance, and repair. Opportunity costs are the costs of missed opportunities green design has repeatedly been proven to provide. Typically those opportunities are related to the building's occupants.

A healthful indoor environment can improve employee comfort, productivity and retention. It can reduce absenteeism and the risk of health-related lawsuits and insurance claims due to poor indoor air quality and other environmental factors. Placing greater emphasis on such people issues through eco-friendly design can pay handsome dividends.

Productivity Gains Visible on Bottom Line

For office buildings, salary costs are 72 times greater than energy costs, according to

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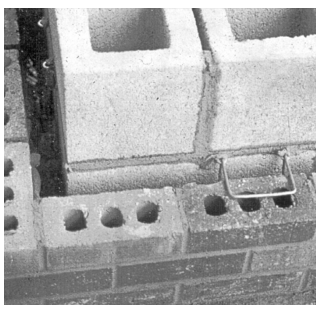
New Wall System Solves Concrete Block Drawbacks

Properly built and insulated masonry walls provide an economical approach to building construction. Single-wythe (single-layer) masonry walls are constructed with the same concrete block forming the exterior and interior wall surfaces. But longtime challenges with the single-wythe wall have been water and air leakage. A more effective, although more costly, approach is the cavity wall. It has two layers of masonry: an exterior layer, usually of brick or stone, and an interior layer of concrete block, with a water drainage cavity in between.

Now a relatively new system provides the benefits of both types of walls. "We were looking for a product that gave us the economy of a single-wythe wall, yet would have the advantages of a cavity wall system," says Martin Choren, Associate Architect at Plunkett Raysich Architects. "This is the only product we know of that can do that," he says.

Reinventing the Concrete Block



A cavity wall is built with an exterior layer and an interior layer, with a drainage cavity in between.

The product is a masonry wall system being used for the first time in a commercial application in Wisconsin at the Boys and Girls Club of West Bend. John Spakousky, a masonry contractor for 22 years, invented the system one cold Alaskan evening to solve many of the problems with traditional block structures.

"I was dismayed by the steady decline in masonry's share of the construction market over the past 30 years," says Spakousky. The

(Continued on page 2)

Criteria for Successful Wall Design

- Control Heat Flow
- Control Air Flow
- Control Water Vapor Flow
- Control Rain Penetration
- Control Light, Solar and Other Radiation
- Control Noise
- Control Fire
- Provide Strength and Rigidity
- Be Durable
- Be Aesthetically Pleasing
- Be Economical

– Neil Hutcheon
Canadian Building Digest, No. 48

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Projects of Note

Close to the Heart *Construction of the new $5 million* ***Heart Hospital Medical Office Building*** *will begin this summer for planned occupancy in early January 2004. The 45,000 square foot two-level building will provide office space for physicians at the adjacent Heart Hospital currently under construction on Riverwood Parkway in Glendale. The office building's exterior will use the same brick, glass and metal accents planned for the hospital. Plunkett Raysich Architects is the designer and Irgens Development Partners is the developer of the medical office building.*

Come On In *An 8,100 square foot church addition and school renovations will commence in Summer 2003 at* ***St. Matthew Catholic Church*** *in Oak Creek. The upper level of the octagon-shaped addition will serve as a gathering space and new main entrance for the church and school. The lower level of the addition will provide flexible space that will be easily reconfigured to accommodate a variety of meeting rooms and storage for the church and school. The entry addition is designed with a future new church building and fellowship hall in mind. The $1.4 million project will be completed in early 2004. Plunkett Raysich Architects has provided master planning and architectural services for the expansion project.*

Lillian Leenhouts, FAIA: Wisconsin Architectural Pioneer

Long before environmental issues got the attention they receive today, Lillian Leenhouts was doing something about it. Born in 1911 and raised in South Milwaukee, her interest in environmentally responsible architecture began in 1933 when she saw the passive solar house designed by George Fred Keck at the Century of Progress Exhibition in Chicago.

Having studied at the Layton School of Art, where she discovered the work of Frank Lloyd Wright, Leenhouts was well aware of the link between art and architecture. From Layton she went to the University of Michigan, graduating in 1936 with her degree in architecture.

After a six-year stint with the Milwaukee Art Institute, Leenhouts earned the distinction of becoming Wisconsin's first female licensed architect in 1942. During the war years, she employed her talents designing smokeless gunpowder plants and naval stations in Wisconsin, Delaware, Georgia, and in Maryland, where she met and married architect Willis Leenhouts. After the war, they established Willis and Lillian Leenhouts Architects in Milwaukee.

Although they specialized in single-family residences, in 1963 they designed Wisconsin's first non-public, non-profit housing for seniors, Milwaukee's 14-story Cambridge Apartments. The building incorporates numerous passive solar design elements. William Wenzler of Wenzler Architects, a close friend of the Leenhoutses, says, "Everything they did was environmentally oriented. They believed in it, stayed with it, and never deviated."

They stressed excellence in over 500 projects, including homes, schools, libraries, and churches. Their plan for the Allen Field School at 730 W. Lapham Ave. included a central courtyard with views to the quiet, garden-like setting from all levels of the school, a real break from traditional school design.

Lillian expressed her appreciation of and concern for the environment in other ways, too. Recognizing the value of the Milwaukee River as a major asset to the city, she established the Architects' River Committee to explore ways to enhance its value, including cleaning it of debris and pollution.

Under Mayor Henry Maier's tenure, she worked to get architects, environmental designers and urban planners engaged, and to get legislative wheels in motion. She foresaw the Riverwalk development much as it has unfolded in recent years, and she was starting to see some changes in the 1980s.

Lillian passed away in 1990, but not before she and Willis became one of very few husband and wife teams to be inducted into the College of Fellows of the American Institute of Architects. Lillian was also a member of the Society of Women Engineers, and the first woman to serve on the Wisconsin Architectural Licensing Board.

She was awarded an Honorary Doctorate degree by the UWM School of Architecture and Urban Planning. A scholarship in her name is available to help aspiring architects. As a true pioneer in these and many other ways, she remains an inspiration to those who have followed in her footsteps. ◆

New Wall System...

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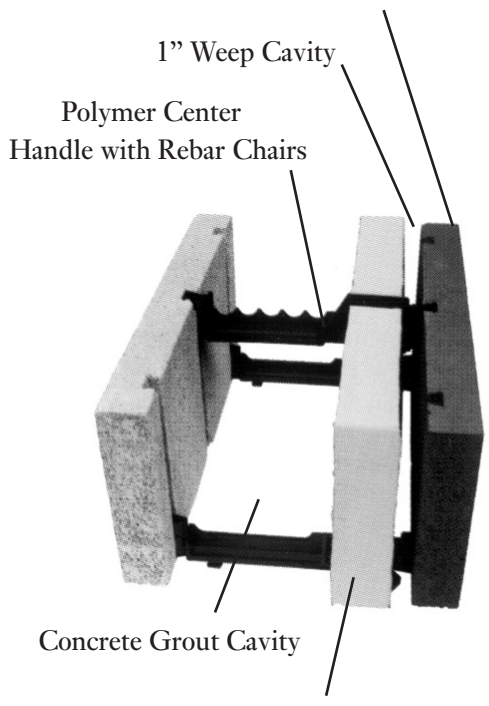
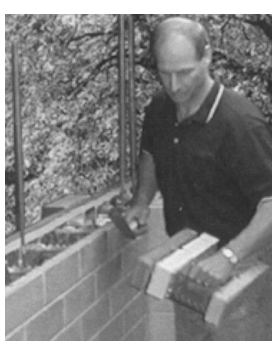


Pentstar masonry units combine the economy of a single-wythe wall and the water tight, energy efficient performance of a cavity wall.



Pentstar's lighter weight makes for easier handling and cuts construction time

decline was a result of three key factors: air and water leakage, low insulation values, and high cost. Spakousky's patented Pentstar® system solves these problems while preserving the enduring qualities of traditional cavity wall masonry.

He changed the internal design of a typical concrete block by replacing the standard webs with an insert connector. The connector acts as a tie between two masonry face shells while dividing the block into two cavities. One cavity receives reinforced concrete for structural strength and the second accepts insulation fill. The resulting wall assembly is water tight, energy efficient (R-25–R-50) and extremely strong.

The gym walls of the expanded Boys and Girls Club are about 30 feet tall, so they require outstanding strength. "This system allows us to build a block wall that's reinforced horizontally and vertically, and it's filled solid with concrete, so it gives us the structural qualities needed to support the roof loads and resist high wind loads," Choren says. "But it also has the insulation in the core and the drainage cavity, so in one product we accomplish everything we need, without the higher cost of a traditional cavity wall."

Walls with Finished Faces

Pentstar masonry units are available in a vast range of interior and exterior colors, finishes and textures. Finishes are simply snapped on to the insert connectors to provide whatever aesthetic look is desired. As a result, walls are put up in one cost-effective operation by a single trade.

Pentstar masonry units weigh 45% less than conventional masonry units, making them easier to handle and cutting construction time. In addition, the system provides excellent sound insulation, fire and wind resistance, and numerous environmental benefits. ◆

Aurora Health Center Project Finishes One Month Early

The single-story building was designed to give it greater prominence than a typical single-story design, and to complement the nearby West Allis Library and the fire station adjacent to Firehouse Square.

Comprehensive pre-construction services helped shrink the timetable and budget for the Aurora Health Center Firehouse Square Project at 7220 W. National Ave. in West Allis. Originally planned for completion December 31, 2002, Aurora actually began moving in to the new 17,200 square foot primary care clinic December 1st.

Beyer worked with Irgens Development Partners, the project's developer, and the City of West Allis for over a year exploring design concepts, providing construction alternatives, and developing budgets. Irgens principal Kris O'Meara says, "Beyer was wonderful to work with. When we had challenges with the budget, they brought up numerous suggestions of where we could save money."

The design concepts included a two-story version, a single-story building with vertical expandability, and the chosen plan, a single-story building with a large atrium entrance. O'Meara explains that one of the design goals was to give the building greater prominence than other single-story designs might have achieved. As an urban renewal site, the city also wanted a design that would complement the nearby West Allis Library and the fire station adjacent to Firehouse Square.

A comfortable reception and waiting area greets patients and other visitors to the new Aurora Health Center.

The Aurora Health Center building design makes good use of the site's trapezoidal shape.

Irgens Project Development Director, Rick Nelson, says "We had a great experience with Beyer. They came in way ahead of schedule and well under budget, which was good not only for us but also for our investors. I had a particularly good experience with the Superintendent, Ken Breidel, who I thought made the project go very smoothly."

Clinic Manager, Christy Miller, says the early completion allowed better preparation for the cold and flu season influx of patients, as well as a smoother move for the three West Allis Aurora facilities the new building consolidates. ◆

The new Aurora Health Center consolidates the services of three Aurora facilities in a single location. Being able to move into the new building a month ahead of schedule benefited clinic operations and project investors.

"Beyer was wonderful to work with. When we had challenges with the budget, they brought up numerous suggestions of where we could save money."

Project at a Glance

Developer:	Irgens Development Partners LLC
Architect:	Welman Architects Inc.
Footprint:	17,181 square feet
Project Cost:	$2.5 million
Project Start:	May 2002
Project Completion:	December 1, 2002

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Wisconsin's 10 Most Endangered Historic Properties

Designated by the Wisconsin Trust for Historic Preservation March 19, 2003. Full details and photos are available at www.wthp.org.

1. **Free Thinkers Hall/ Barre Mills Town Hall – Barre Mills**
2. **Convent of the Holy Nativity – Fond du Lac**
3. **Escanaba & Lake Superior Railroad Depot – Marinette**
4. **The Foote House – Omro**
5. **The Wittman Hangar – Oshkosh**
6. **The Mineral Point Masonic Lodge – Mineral Point**
7. **Dinesen House – Mole Lake**
8. **Pape House/Louis Martini Store – Springfield Corners**
9. **Big Box Stores vs. Small Business**
10. **Wisconsin Historic Sites**

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Newsletter Team:
Editor & Key Grip – George Beyer
Writer – Richard Fraser
Design & Production – Yuhas Graphics

Your comments and suggestions are welcome.

Phone: 262-789-6040
Fax: 262-789-6055

Green Design...

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Morton, and they account for 92 percent of a building's life cycle costs. In the early 1990s, West Bend Mutual Insurance Co. recorded a 16 percent productivity gain after moving its headquarters into a new 150,000 square foot building. The building's green design elements include daylighting, individual workstation environmental control, and connectivity to nature.

With an annual payroll of $13 million at the time, the value of the improved productivity was over $2 million per year. In addition, employee complaints about air temperature dropped from 40 per day (conservatively estimated at $25 per call) in its previous building to just two per week in the green building. Similar examples abound.

"If you connect the staff to the outdoors, bring in available light, and take advantage of natural ventilation, people tend to be happier and healthier; it's that simple," says Joel Krueger, Project Architect at The Kubala Washatko Architects, Inc.

"The first thing we do when we pick a building site is to determine where south is," he says. That helps orient the building to capitalize on the available sunlight. Two additional practices at the firm are to include high performance windows on two sides of every room wherever possible, and to assure that the building has a good insulative skin.

"When you use that approach in designing the building and massing its footprint, it has an amazing effect," says Krueger. Rather than putting everyone in cubicles, Krueger says his firm also makes sure that every office has a view to the outside.

Costs of Green Design No Longer an Issue

While the initial costs of green design may once have been considered prohibitive, the cost per square foot of an eco-friendly, occupant-friendly building today need not exceed more traditional designs. Of course, there are different shades of green.

"You can do all kinds of costly things with HVAC and plumbing and so on, but the most profound thing you can do is to take advantage of natural daylight," Krueger says, because it has a trickle-down effect on a building's heating, cooling and electric lighting loads. And designing to take advantage of daylight does not have to cost anything extra.

It's very difficult to predict what kinds productivity gains may be expected with an environmentally-friendly building compared to a conventional design but the potential energy savings can be documented, modeled and proven before construction begins.

As fuel prices peaked again earlier this year, we were reminded once again of the need for energy-efficient buildings. Understanding the costs of the missed opportunities of conventional design can help drive a real appreciation of why green design makes good business sense. ◆

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3200 S. 166th Street
New Berlin, WI 53151-4141

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