



# THE Cornerstone

**WHAT'S INSIDE:**

- A message from the executive director 2
- Don't be impervious to this pavement 2
- In a tiff over TIFs 3
- News briefs 3
- Constructive visions of sustainability 4

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Building Alliance**

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**CASE STUDY**

## Breaking the Mold

**CASTCON-STONE, INC.**

**Owner:** CastCon-Stone, Inc.  
**Building function/size:** Manufacturing facility (30,000 sq. ft.), storage building (relocated, 12,000 sq. ft.) and office building (5,000 sq. ft.)  
**Location:** Clinton Township, Pennsylvania  
**Date completed:** March, 2003  
**Cost:** \$3.875 million, not including land and process equipment  
**Architect:** Perkins Eastman Architects  
**Other team members:** Clearview Project Services Company, Gabriel Enterprises, Tudi Mechanical Systems, Ray Engineering, Olsen Engineers, H.F. Lenz Company, Sustainaissance International, University of Pittsburgh, Green Building Alliance  
**Awards/certifications:** Office and employee buildings have been registered for LEED certification

The recently opened CastCon-Stone, Inc., a precast concrete manufacturing facility in Butler County, exemplifies intelligent planning. The benefits of its design approach are actually greater than the sum of the environmental benefits of brownfield reuse and the economic benefits of energy savings. As was hoped, the company has found that their new facility is very productive, enjoyable, healthy and has an important story to tell. The project literally embodies the company's owners, as well as one of their guiding philosophies.

It was in the year 2000 that CastCon decided to relocate from Cranberry Township to a 17-acre site located in the Victory Road Business Park in Clinton Township. As home to a USX sintering plant until 1985, the park received clearance under Act 2, which, through incentives, encourages the voluntary cleanup and reuse of contaminated commercial and industrial sites. New infrastructure and utilities were installed on the land and it

was designated as a Pennsylvania Keystone Opportunity Zone, thus granting CastCon various state and property tax benefits. "Working on a brownfield was a mixed blessing," says one owner, Laura Huch, equating the location to a "minefield." There were unforeseen foundation and soil problems during construction, although about \$150,000 worth of slag was unearthed and utilized for site grading.

An integrated design process was undertaken from the earliest stages, notes Huch, with the major team players on board around two years prior to breaking ground. As the project site was being considered, Huch and her sister Sandra Ussia, who own CastCon together, engaged Perkins Eastman Architects to create a master plan for the facility. This process included interviews with many stakeholders, notably company employees, regarding what they would like to see. The optimal pro-

duction process was discussed with the aid of an industrial designer and work space was considered in terms of ergonomics. Bob Kobet, a local architect and green consultant with Sustainaissance

International, led a day-long workshop that included four interdisciplinary teams composed of the client, user groups, designers, builders, the site developer and engineers. With the help of Robert Ries of the University of Pittsburgh, existing site conditions such as brownfield reuse, wind, sun, soil, topography and drainage were analyzed. The resulting master plan included project guidelines, proposed adjacencies and building system recommendations, along with a proposed project schedule and budget.

Construction documents were nearly complete at the time the Green Building Alliance became involved by bringing Green Building Fund (GBF) monies to the project.

**"It's not enough to do green design for philosophical reasons; it has to be financially feasible from a return on investment standpoint."**

See *CastCon*, page 4



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## from the ground up...



### A view from the Executive Director

The countdown has begun! There are approximately five months remaining before the green building world descends on Pittsburgh this November 12-14 for the Greenbuild International Conference and Expo. Over 5,000 attendees are expected at this U.S. Green Building Council event, including 200+ exhibitors and 300+ presenters. It will be a unique opportunity to proudly show all the great work that is occurring throughout the entire Commonwealth of Pennsylvania.

Some years ago, seeds of sustainability were planted here through the greening of the Heinz Family Foundation offices, Slippery Rock University's Masters of Sustainable Systems program, Carnegie Mellon University's Center for Building Performance & Diagnostics, CCI Center's green construction, the Governor's Green Government Council (GGGC), and our own Green Building Alliance. While these are just a few of the pioneer efforts that have strengthened the region's green movement, there is no better icon for our 50-year journey from rust belt to green belt than the new David L. Lawrence Convention Center, which is hoping to achieve a LEED Gold rating.

- Fifty years ago we were leaders in improved air and water quality;
- twenty years ago we became leaders in brownfield redevelopment;
- today we are leaders in reducing the impact of development on humans and the environment, the essence of green building, and have 30 LEED projects underway or completed;
- and, when you add to this our expanding network of trails and green spaces, you'll find a region that has totally remade itself over the past half century. I would dare to say that there is no other area in the world that has as great a legacy as ours in connecting economic development with environmental responsibility to achieve a high quality of life.

Greenbuild will provide us with a platform to demonstrate to the world what we have always known, that Pittsburgh is a leader in environmental transformation. Congratulations to everyone that has been a part of making this region a green leader. Join us at the conference to celebrate our successes and showcase the programs, projects and people who have made it all happen!

GBA is serving as the coordinator of host committee activities. Please call us if you want to volunteer or have questions about Greenbuild.

Rebecca

# Green Spotlight on...

## Pervious Paving

Cornerstone speaks with Jim Pillsbury

**Q: What are the differences between pervious and impervious paving?**

**A:** Pavement is necessary to support the weight of vehicles and to provide a hard, firm driving surface. Without pavement, we would have mud in wet seasons and dust in dry times, much like road conditions 100 years ago. Most types of pavement are designed to be impervious, which means that they do not allow any water to pass through them into the soil below. In contrast, pervious pavement is made of material that supports the weight of vehicles while simultaneously allowing rainfall to penetrate into the subsoil.

**Q: Describe the pervious pavement systems used where you work.**

**A:** The Westmoreland Conservation District's parking lot, a project sponsored by Growing Greener grants, showcases seven different types of pervious paving systems. We built a 50-foot by 60-foot, ten-space parking lot, along with a driveway. The seven various paving materials we used are divided among an equal number of sections over this surface.

The subsurface soil was leveled with a bulldozer, a geotextile laid above it and then ten inches of clean, crushed stone was placed on top of that. The lot was "paved" with three types of concrete pavers and four types of plastic paving. The former varieties included interlocking circular and triangular concrete blocks; rectangular, lattice-like blocks; and concrete bricks with plastic spacer strips. The latter plastic systems included an expandable plastic web; two kinds of grid-type paving blocks; and one roll-out, grid-like product. Two of the plastic products are made of recycled material and each of the seven pavers has spaces filled with small pieces of gravel to allow rainwater to pass through to the crushed stone base underneath.

**Q: What was the cost?**

**A:** Our pervious parking lot was installed by a contractor who put in the heavy concrete blocks and by Boy Scouts who installed the plastic paving materials. The cost, between purchase and installation, was about five or six dollars a square foot. This figure is quite a bit more than regular asphalt parking lot pavement, and our long-term hope is that this type of pavement will become more widely accepted and used, bringing down the cost.

**Q: What are the benefits of pervious pavement?**

**A:** The benefits are numerous and include the infiltration of rainfall into the subsoil; recharging of groundwater; treatment or capture of vehicle pollutants; elimination of runoff and the need for curbs, storm drains, pipes and a detention pond; reduction of the urban heat island effect; and aesthetic benefits.

**Q: How well does your system perform in the Western Pennsylvania climate?**

**A:** Our system has now survived two winters – one mild and one quite severe. The plastic pavers are not affected by the freeze-thaw process because they are durable and flexible, while the concrete pavers aren't hurt either because there are so many individual pavers with joints between them. In freezing rain conditions the pavers become slick with ice build-up since salt falls into the spaces between the pavers and therefore doesn't melt the ice on top.

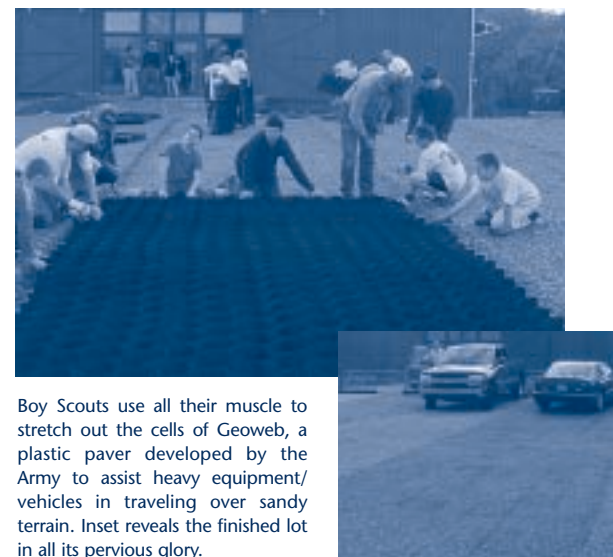
Snowplowing was performed with impunity this winter by trucks, tractors and a large rubber-tired excavator. A careful operator is imperative to snow removal from this type of surface and, since the blocks cannot be completely cleared, the surface remains somewhat snowy and lumpy.

**Q: What would you do differently next time?**

**A:** We probably should have filled in all of the blocks with angular crushed stone instead of round river gravel, which would have made a firmer surface. Also, since one section of the plastic pavers did not interlock well and was too flexible, it had to be replaced with another kind of plastic block that is more rigid and locks together better. When vehicles drove over the initial pavers, they separated and began floating up through the pea gravel, creating a hazardous, uneven surface.

Ladies don't like the blocks because they are hard to walk on while wearing high-heel shoes, and some people don't like the fact that, as already mentioned, snow cannot be completely removed from the surface.

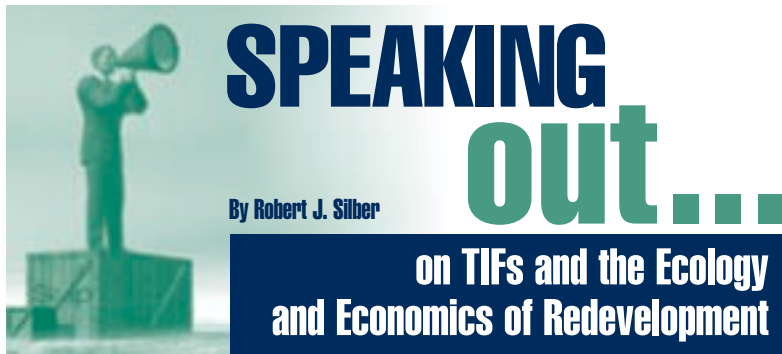
*Jim Pillsbury is a hydraulic engineer for the Westmoreland Conservation District, where he has worked for 15 years. He specializes in stormwater runoff and water control, streams and wetlands. He has a BSCE from Penn State University and is a Pennsylvania registered professional engineer.*



Boy Scouts use all their muscle to stretch out the cells of Geoweb, a plastic paver developed by the Army to assist heavy equipment/vehicles in traveling over sandy terrain. Inset reveals the finished lot in all its pervious glory.

#### Resources on pervious pavement include:

- *Introduction to Stormwater* by Bruce K. Ferguson.
- "Paving without Asphalt or Concrete," *Environmental Building News*, Vol. 8, No. 11 (Nov.1999), [www.buildinggreen.com/products/road\\_oyl.cfm](http://www.buildinggreen.com/products/road_oyl.cfm).
- "Re-Evaluating Stormwater: The Nine Mile Run Model for Restorative Redevelopment" by Bruce Ferguson, Richard Pinkham, and Timothy Collins. *Environmental Design + Construction*, [www.edcmag.com/edc/cda/articleinformation/features/bnp\\_features\\_item/0,4120,21198,00.html](http://www.edcmag.com/edc/cda/articleinformation/features/bnp_features_item/0,4120,21198,00.html).
- For general information or help finding a concrete contractor or product: [www.concretenetwork.com](http://www.concretenetwork.com)



# SPEAKING out...

By Robert J. Silber

## on TIFs and the Ecology and Economics of Redevelopment

Over the last several years, Allegheny County has used TIFs (Tax Increment Financing) to subsidize the development of large retail centers in ecologically sensitive areas.

To understand how we got to the point where Allegheny County is using millions of tax dollars to subsidize the creation of big-box store developments in previously undeveloped, suburban communities while many areas in true need of redevelopment assistance are left unaddressed, we need to go back to 1945. In that year, Mayor David Lawrence and the state legislature created the Urban Redevelopment Law to assist in the redevelopment of the Golden Triangle and the creation of Point State Park. That law set conditions for "blight" and allowed the government to redevelop areas if one of several terms was met. These conditions referenced such things as faulty street layout and inadequate light and fresh air in order to clearly describe older urban areas that didn't benefit the public and were unlikely to be redeveloped.

Now fast forward to 1990. In that year, the legislature passed an amendment to the 1945 law, called the Tax Increment Financing – or TIF – Act, which provided a funding mechanism for the redevelopment of those blighted, urban areas. Essentially, tax bodies such as the city, the county, and municipal and school districts would be able to declare an area blighted and then borrow money by issuing bonds that would be paid off by the difference between the present and future taxes of a redeveloped property. That increase in tax revenue is the tax increment.

Because Allegheny County's 130 municipalities and 46 school districts are in a perpetual state of tax revenue warfare, each taxing body is desperate to attract new development to its jurisdiction. That circumstance, along with the fact that we no longer have a County Department of Planning, has led to a situation wherein developers interested in large retail suburban developments can call their own tune and receive millions of dollars in assistance to create these big-box mega-centers. Areas that were previously passed over for development due to difficulties such as floodplains, wetlands and steep, unstable slopes now seem desirable to developers.

Of course, in an area of stable to declining population, new retail developments inevitably steal sales, jobs and tax revenue from already developed areas. Thus, rather

than increasing the local tax base, these TIFs for retail developments on greenfield sites actually lower the base. This occurs as sales are taken away from businesses that pay 100 percent of their taxes and are shifted to the new developments whose taxes are mainly used to pay off bonds that built the roads and infrastructure to service the development. As economists know, the retail sector has a low multiplier effect, meaning that few new jobs are truly created through minimum wage openings in big-box malls (the Wal-Mart effect).

With this area's crumbling roads and billion-dollar stormwater/sewage problems going unfunded and unaddressed, the idea of using tax dollars to further stretch our infrastructure and build new retail centers is a cruel parody of economic development. Concern from fiscal conservatives, environmentalists and nearby residents, however, has led to significant opposition of these TIF deals and discussions on the need for TIF reform at the county and state levels.

*Robert J. Silber is the director of advocacy and outreach for Allegheny Riverkeeper, and political co-chair of the Sierra Club and Allegheny Group. He is currently involved in litigation against two TIF developments, Deer Creek Crossing and Mount Nebo Pointe. Mr. Silber can be reached at silber828@cs.com.*

Opinions expressed in Cornerstone are not necessarily those of the publication or the Green Building Alliance.

### UPCOMING EVENTS

**ALLIANCE BUILDING BREAKFAST**  
July 23 (Wednesday), 7:30 - 9:00 a.m.  
Funding Green Building

**BROWN BAG LUNCH  
& NETWORKING**  
August 15 (Friday), 11:30 a.m. - 1:00 p.m.  
Topic/speaker TBD

**WORKSHOP**  
September 12 (Friday), 8 a.m. - noon  
Post-Occupancy Evaluation

**ALLIANCE BUILDING BREAKFAST**  
September 24 (Wednesday)  
Green Construction Practices

See [www.gbapgh.org/events.asp](http://www.gbapgh.org/events.asp)  
for details on any of the above events  
as they become available.



**GREENBUILD CONFERENCE  
& EXPO**

November 12-14 (Wednesday - Friday)  
See [www.greenbuildexpo.com](http://www.greenbuildexpo.com)  
for details and to register.

### Briefly Stated...

**FREE ASSISTANCE IS AVAILABLE TO PENNSYLVANIA SMALL BUSINESSES INTERESTED IN REDUCING THEIR ENERGY COSTS** through this mouthful: the Environmental Management Assistance Program of the Pennsylvania Small Business Development Centers (SBDC). This program reviews utility bills and conducts on-site energy assessments to identify cost-saving opportunities specific to each business. Additionally, confidential assistance can be provided on environmental, health and safety regulatory compliance; and environmental and energy technology development. Call Derek James at (215) 898-1284 or visit [www.pasbdc.org/emap](http://www.pasbdc.org/emap) to learn more.



**FOR INFORMATION ON THE GREATEST FUEL-MISERS IN 2003 VEHICLE CLASSES,** visit [www.thecarconnection.com/index.asp?article=5805](http://www.thecarconnection.com/index.asp?article=5805).

**IF YOU'RE THINKING OF FURTHERING YOUR EDUCATION, CONSIDER A LEISURELY INTERNET CRUISE.** Duquesne University's Center for Environmental Research and Education

is currently accepting applications for its new online Master of Environmental Management program. The curriculum emphasizes environmental regulations and laws, pollution prevention, air quality and environmental technologies. Three required residency periods at the campus in Pittsburgh are structured to accommodate busy professionals and are held over three-day weekends. To learn more about this degree program (the next students will be accepted for an August start date), contact Dan Donnelly, Ph.D., at (412) 396-4367.

**THE LARGEST SOLAR ELECTRIC SYSTEM IN ANY UNIVERSITY IN THE WORLD**—and one of the largest such systems in the nation—will be installed this summer at California State University, Hayward. The on-site solar generation system will deliver approximately 30 percent of the campus' peak electricity demand during the summer months. Covering 110,000 square feet, it will feature both rooftop- and ground-mounted installations. The latter part of the system, which captures up to 30 percent more energy than fixed systems by following the sun, will be installed in an unused field. Relatedly, the University of Pennsylvania recently increased its previous commitment to wind power to 10 percent of its electrical use. This translates into the assigning of the output of 10 turbines to the university for 10 years.

### THE RECHARGEABLE BATTERY RECYCLING CORPORATION (RBRC)

is offering environmentally safe ways to collect, transport and recycle portable rechargeable batteries to individuals and businesses. By visiting the organization's website ([www.rbrc.org](http://www.rbrc.org)), individuals can enter a location or zip code to find the nearest battery recycler. Nickel cadmium, nickel metal hydride, lithium ion and small sealed lead batteries are acceptable for recycling. Recovered materials are used to make new batteries and stainless steel products.



**STILL HAVE THE FIRST COMPUTER YOU EVER OWNED LURKING IN YOUR ATTIC OR BASEMENT?** Or how about your grandmother's old green stove? The Pennsylvania Resources Council and Construction Junction will be hosting monthly collections for various items through September. All collections will be on Saturdays from 10 a.m. to 2 p.m. and take place at Construction Junction, 214 N. Lexington Street, in the North Point Breeze section of Pittsburgh. On July 19, appliances will be taken; electronics and tires on August 16; and appliances again on September 20. Call (412) 431-4449 x243 for further information.

## Groundbreaking Ideas...

## Beyond Sustainable

The U.S. Green Building Council (USGBC) defines green design as practices that “significantly reduce or eliminate the negative impacts of buildings on the environment and occupants.” Introductions to these issues frequently refer to the impending environmental disasters that will occur if we continue with current, traditional practices. Such discussions frame the purpose of green building in terms of what is to be avoided rather than what should be embraced. Of course we want to avoid destruction, but what is our *constructive* vision for doing this?

Through the Green Building Alliance’s Green Vision lecture series, new in 2003, practitioners are invited to think about this question and what it means for our region. So far, these lectures have included Bill McDonough speaking on “The Next Industrial Revolution,” David Orr talking about “Designing a World that Works,” and Bill Reed discussing “Regenerative Design.” A fourth lecture is planned for September.

All three speakers have stressed that a better understanding of the relationship between humans and nature is critical to a positive, constructive framework for green building. It is characteristic of the industrial age to treat natural resources as a commodity, an input to our economic activities. This places humans in a dominate posture in relation to the natural world, making its resources ours to use and control. Concerns over the ensuing pollution and resource depletion then give rise to the “old environmentalist” view, which sets nature on a pedestal, in need of protection from humans. Is the individual’s role in nature to dominate or to preserve? These two views polarize conflicts, pitting economic gain against environmental preservation, while also furthering the fallacy that humans are somehow separate from nature.

Everything we do, every object we handle, is embedded within the order of the natural world. A fairly simple idea with both spiritual and scientific implications, the act of fully adopting this systems perspective would be a profound cultural shift.

Throughout popular media, humans are most often depicted as individuals whose connection to the world begins through their consumption choices and ends with the waste they create. In advocating ecological literacy, Orr stresses how individuals are connected to their economic and social systems, which operate within the earth’s ecological system. As expanding technology and a growing population increase the scale of human activity, the connection to this system becomes impossible to ignore. To cite an example from Reed’s lecture, overfishing of pollock in Alaska led to a decline in that

state’s seal predators, which in turn led to whales feeding on sea otters instead of seals. Then, further, that led to an increase in sea urchins that normally fall prey to otters. The large number of urchins, which feed on kelp, led to the destruction of kelp forests that protect the shoreline from erosion. The end result of this chain was the collapse of coastal houses into the sea.

Far from merely an intellectual exercise, the shift to an ecological systems perspective can offer many solutions. Returning to our earlier question, this viewpoint provides a rich, constructive vision for green building. Reed suggests that such an approach leads us back to the master builder paradigm for design, wherein there is reliance on the knowledge of local ecology and materials. Design strategies that depend on natural systems, such as daylighting, air circulation and stormwater absorption, are quickly returning to standard practice. These methods are only the beginning of what nature can provide directly in the way of services. Beyond that, nature has been perfecting its materials and technologies for centuries, and we are increasingly turning to it for inspiration and models in engineering.

Noting that the term “sustainable” seems plodding and uninspired, McDonough challenges us to reach higher for vitality and healing through the interdependence among humans and nature. We’ve only just begun.

**For further information on this topic, please see one or more of the following publications/articles:**

- *Biomimicry* by Janine M. Benyus.
- *Balance Point* by Joseph Jenkins.
- *Natural Capitalism* by Paul Hawken, Amory Lovins and L. Hunter Lovins.
- “Dancing With Systems” by Donella Meadows. Piece can be found within *Whole Earth* magazine, Winter 2001; *The Systems Thinker* newsletter, Vol. 13, No. 2 from March 2002; or online at <http://sustainer.org/pubs/Dancing.html>. (Besides containing the text of “Dancing With Systems,” this website also has links to both *Whole Earth* and *The Systems Thinker*.)

CastCon *continued from front cover*

Since this fund stipulates LEED certification, which the project had not originally set as a goal, it is a testimony to CastCon’s overall green goals that certification could be sought so late in the process and yet result in only very minor design changes. GBF shared additional costs with CastCon required by LEED, amounting to approximately \$30,000, for energy modeling, commissioning services and project documentation.

The goal of striking a balance between sustainable design goals and fiscal responsibility served as a useful design determinant. “It’s not enough to do green design for philosophical reasons; it has to be financially feasible from a return on investment standpoint,” says Huch. “It was our goal to not have this green facility cost any more than a well-built conventional one, and was just the appropriate way for us to go.” The installed lighting sensors, energy recovery wheel and increased insulation are projected to have a quick six-month payback. Xeriscaping\* and rainwater collection for landscape irrigation will eliminate irrigation costs, while the placement of drainage ponds already eliminated the need for over \$150,000 in stormwater piping. Money was also saved through high insulation levels and efficient lighting that allowed the mechanical systems to be downsized. The open and daylight office area achieved indirect benefits through the creation of a bright, comfortable and productive environment that employees



The metal panel walls in the office building create a clean, comfortable workspace and eliminate the need for interior finishes. Employees need not strain their eyes due to both abundant indirect lighting and daylighting.

not only enjoy, but that has also reduced staff absenteeism. CastCon is also refining their industrial process and experimenting with flyash content and glass aggregate. The plant recycles all concrete and metal scrap, and is refining its computation processes for raw material use. After one year of operation, the company plans to compare the model to actual costs in order to get an overall picture of benefits.

Huch has begun lecturing about this remarkable building to various concrete and precast trade groups, local architecture firms

## green highlights

**sustainable site:** reclaimed brownfield site, stormwater retention and bioremediation ponds, xeriscaping  
**water efficiency:** rainwater cistern for irrigation  
**energy & atmosphere:** energy modeling projects produced 60% savings, motion sensors for fluorescent lighting, tight icynene envelope  
**resources & materials:** used slag found on site as a paving base, relocation of entire storage building from company’s previous location, elimination of interior finishes  
**indoor environmental quality:** open, daylight design; IAQ plan  
**process:** initial master plan, LEED certification, early planning charrette, integrated design process, input from all stakeholders

and, she hopes, attendees at the Greenbuild conference in November. “How do you develop an enlightened owner?” Huch rhetorically queries her audiences. “You start the process early,” she answers herself, “preselect the team, include end users in discussions, and appreciate how the team members can work together. Also, take a long-term perspective on the project since all the involved people are ones that you hope to do business with in the future.”

Aside from discussing the impressive green attributes of her facility, Huch strongly urges an integrated design process, calling it “the cornerstone of green building. The earlier you start, the better. In our case, goals were firmly established and agreed upon so they transcended any problems that arose. The mentioned trouble with our foundation, for instance, delayed the project a bit, but things never became adversarial. It was always a team effort.”

\*The term *xeriscape* is derived from the Greek word *xeros*, meaning dry, combined with landscaping. The term was coined by the Front Range Xeriscape Task Force of the Denver Water Department in 1981. The goal of a *xeriscape* is to create a visually attractive landscape that uses plants selected for their water efficiency. Properly maintained, a *xeriscape* can easily use less than one-half the water of a traditional landscape and, once established, should require less maintenance than a turf landscape.

The Cornerstone is published quarterly by the Green Building Alliance, a Pittsburgh-based non-profit organization that provides expert services and reliable information to facilitate green building solutions – and, in the process, helps our region thrive.  
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