

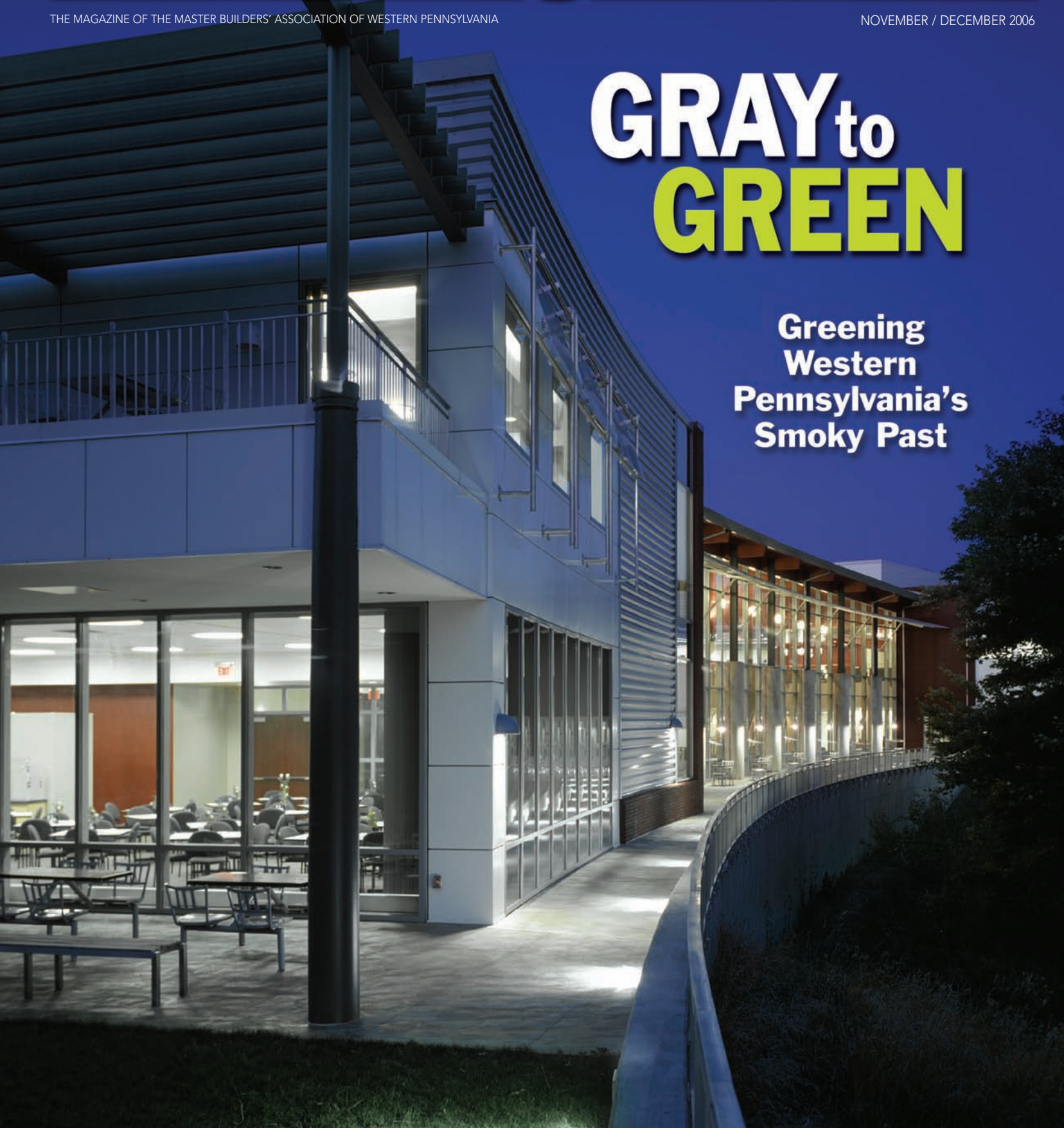
# Breaking Ground

THE MAGAZINE OF THE MASTER BUILDERS' ASSOCIATION OF WESTERN PENNSYLVANIA

NOVEMBER / DECEMBER 2006

## GRAY to GREEN

Greening  
Western  
Pennsylvania's  
Smoky Past







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COMMERCIAL

# Publisher's Note

If you grew up in Lancaster PA in the 1960's and 1970's, as I did, it's a good bet that your 5th grade Civics book contained a picture of Pittsburgh to illustrate air pollution. For most of the 20th century Western PA had a well-earned reputation as an environmental mess. A newcomer to Pittsburgh in 1979 might have wondered, as I did, how there could be so many laundries and dry cleaners downtown. Had he or she been here 40 years earlier, however, the experience of going to lunch with a clean shirt and suit and returning with sooty clothes would have cleared that mystery right up.

The story of how a region so befouled by the residue of manufacturing and heavy transportation could become a leader in environmental responsibility is one of design and education and chance and, frankly, economic disaster. Like most turnarounds the impetus behind the "greening" of Western PA came from a handful of committed individuals who simply refused to relent.

Researching Pittsburgh's green story was like pulling on a thread in a very large sweater. At some point one has to stop and go to press, so there are also a number of committed individuals and firms who aren't featured here, but who have been designing environmentally-sensitive projects for as long as two decades before LEED was established. Even though they are not part of these articles it's important to recognize pioneers like Bob Kobet, Dick Rittelmann, Tai + Lee Architects, Chris Klehm, Vivian Loftness, Christine and Marc Mondor, and even more still unmentioned.

One of my concerns about dedicating an edition to building green is that the subject has been done-to-death already; but, Pittsburgh's story of change hasn't been told enough. Anyone watching ESPN introduce the Steelers game with the time-worn (and inaccurate) video of steel-making furnaces knows that not everyone has gotten the message.

As we explored sustainable design and construction in this edition a two-sided pattern emerged on nearly every issue. For those who have focused their careers on green issues or made green decisions there seemed always to be both a sense of doing the right thing alongside a practical rationale. Since BreakingGround is a business publication we sought to shine a light on the practical so that even the cynical reader would understand that there are bottom-line justifications for acting responsibly.

BreakingGround is especially grateful to the people at the Green Building Alliance (GBA) and the U. S. Green Building Council (USGBC) for trying to guide us toward the relevant issues and away from the trite.

Before jumping in, it may be helpful to provide a dictionary of sorts for the commonly-used acronyms that will be thrown around freely in this edition. First, the USGBC is a non-profit organization devoted to the education, certification and evangelism of sustainable design and construction. It is they who established LEED criteria and who certify buildings. The GBA is the affiliated organization doing the educating, etc. in Western PA. The GBA actually pre-dated USGBC, but more on that later.

The acronym you'll read most about in this edition (including references above) is LEED™ for Leadership in Energy & Environmental Design. LEED is the rating system established by USGBC to provide the industry with consistent, objective and verifiable standards for green building. The LEED rating system is applied by a third party to certify a building; LEED standards are also used to accredit people so that they may properly lead (sorry) their businesses in sustainable projects. Remember, buildings are LEED-certified, people become LEED-accredited.

**...came from a handful of  
committed individuals  
who simply refused  
to relent.**

Also, during the preparation of this edition Don Peters and Mayor Bob O'Connor passed away. Both of these men had a significant impact on real estate and construction,

although in very different ways.

Don Peters was an industry leader for decades and directed many of the organizations which still benefit the community today. Bob O'Connor lead our city, and region, for less than a year, and had little direct impact on capital spending or development, yet his impact on the region's self image played a significant role in the construction boom we're currently experiencing. For these reasons we'll remember each of the men in this edition of BreakingGround.

Sincerely,



Jeff Burd

# News From The Street

## CMU Construction Booming

Three major projects totaling \$140 million are coming into the construction pipeline at Carnegie Mellon University, including two which result directly from the university's leadership role in the emerging technologies. Construction has started on the second phase of renovations and expansion of Doherty Hall. The \$20 million project, designed by Burt Hill, involves 171,000 sq. ft. Jendoco Construction is the contractor.

CMU is in the final design stages for the new \$64 million Gates Center for Computer Science. The two-structure, 209,000 square foot facility will sit on a 5.6-acre site on the West Campus and will include 318 offices as well as labs, computer clusters, lecture halls, classrooms, and a 250-seat auditorium. University officials will seek Gold LEED certification from the U.S. Green Building Council for the new facility. The project architect is Mack Scogin Merrill Elam, landscape architect is Michael Van Valkenburgh Associates, and EDGE studio is the local affiliate architect. P. J. Dick Inc. will be the construction manager.



Gates Center: Rendering courtesy of Mack Scogin Merrill Elam Architects

The building, made possible by a \$20 million gift from the Bill and Melinda Gates Foundation, will create lab and research space for 350 post-graduate students and 100 post-doctoral researchers, and offices for 120 faculty members and 50 administrative staff members. The Gates Center will focus on fostering new technology in computers and software to be developed and tested within the campus.

Site identification is underway for the construction of a \$66 million facility to supplement the Collaborative Innovation Center that opened in 2005 and houses Google, Apple Computers, Intel and Microsoft offices. The new building will feature the Commercialization Center for Nano-Enabled Technologies, focused on research and development in the burgeoning field of nanotechnology.

Carnegie Mellon will receive \$4 million in state redevelopment assistance to help with the development of the 180,000-square-foot building, which it hopes to have under construction sometime in 2007.

Carnegie Mellon is a leading research institute in nanotechnology, and the facility will be used to further R & D in the field, which has seemingly unlimited commercial potential, but limited current applications. Nanotechnology involves the creation and manipulation of minute materials which possess enough strength for commercial use. The best-known current application for nano-materials is probably as a stain or water resistant fiber popularized in television commercials.

The state has been positioning itself to become a hub for nanotechnology, spending some \$54 million since 1999 to try to capitalize on its assets.

## Green Building Summit

Two of Western PA's leading organizations in the areas of historic preservation and sustainable construction will be coordinating a national summit called the Greening of Historic Properties, to precede the National Trust for Historic Preservation annual conference at the Hilton Hotel and Conference Center Downtown.

The Green Building Alliance and Pittsburgh History & Landmarks Foundation are presenting the Summit on October 30 at the John Heinz Pittsburgh Regional History Center between 9:00 AM and 4:00 PM, followed by a Town Meeting from 5:30 to 7:30 PM. The Preservation Conference opens the following day and runs through November 5.

The purposes of each organization has lead to an ongoing working relationship between the GBA and PHLF but the National Summit marks the first time a national meeting has been held to formalize discussions between the green building and preservation groups.



Experts in both areas will speak at the Summit to discuss LEED requirements for historic preservation.

A booth for the "Greening of Historic Properties" will be open at the conference November 1-3 for public comment and ideas. The information gathered will be presented at the USGBC's GreenBuild in Denver later in November.

## UPMC Expanding

In the midst of the construction of the \$450 million new Children's Hospital in Bloomfield and the \$30 million Magee Women's Hospital Research Center, the University of Pittsburgh Medical Center is in planning for another round of construction to meet the demand of its growth centers. Architects Perkins & Will of Chicago have been doing master planning for how its remaining facilities will be configured.

In the North, UPMC has hired Burt Hill to design an expansion to its Passavant Hospital campus in McCandless. Construction of a seven-story addition of almost 150,000 sq. ft. is expected to start in 2007, and will include new operating rooms and expanded emergency and cancer facilities. Further expansions of UPMC Passavant Cranberry are also planned. The total cost of the project is \$150 million.

Several plans for the Shadyside Hospital and Hillman Cancer Center neighborhood have been discussed since the opening of the Hillman Center in 2003. The success of the Cancer Center has created demand for another facility of nearly identical size across the street. At recent discussions with a Shadyside neighborhood group a site plan was shown which indicated a 280,000 sq. ft. Hillman Center II, and an eight-story 240,000 sq. ft. addition to UPMC Shadyside Hospital. The Shadyside Hospital facility is a strategic asset because of its joint licensing with the Presbyterian University Hospital campus. As the Children's Hospital becomes occupied over the next couple years Shadyside Hospital will be important to allowing flexibility in reconfiguring the services offered at the Oakland hospitals.

In addition to these plans the health system announced on September 22 that it would merge the Mercy Hospital into its operations. The evaluation of what services and administrative duties would be distributed between the former competing healthcare providers will likely slow the progress of the Oakland and Shadyside plans temporarily, but the integration of Mercy into the UPMC system will also require additional construction beyond the original master planning. Mercy Hospital's average patient load is about 75 less than its 428-bed license, which may reduce some of the demand for additional beds being planned in Shadyside and Oakland.

## PA Judicial Center



## Moves Ahead

The Department of General Services made contractor selections in the last week of September for construction of the new Pennsylvania Judicial Center in Harrisburg. Mascaro Construction of Pittsburgh was awarded the General Construction contract for \$78,950,000. The HVAC and Plumbing contracts were awarded to McClure Inc. of Harrisburg; S. A. Comunale was awarded the Fire Protection, and Farfield Co. was awarded the Electrical contract. The \$107 million project was contracted using the "best value" process, and was the last project allowed using best value prior to an injunction against that method that was issued May 18, 2006.

## MEDRAD Continues Rapid Expansion

Work is about to get underway on a second new facility for medical equipment manufacturer MEDRAD Inc. The project is a \$45 million, 120,000 square foot plant and warehouse in the Victory Road Business Park outside Saxonburg in Butler County. Mascaro Construction is the contractor for the project, which will be built to be LEED-certified. The project is being designed by CRB.

The plant will manufacture sterile disposable syringes and should create 100 jobs upon opening in 2007. MEDRAD CEO John Friel indicated that the plant could employ another 400 employees within five years. "This expansion and subsequent job creation is good news for MEDRAD, and it's good news for our region's economy," said Friel, whose company employs 1,100 locally. Located 30 miles north of Downtown Pittsburgh and about 14 miles from MEDRAD's Indianola location, the new facility will include a manufacturing clean room, offices for support staff and warehousing for global distribution.

The project marks the second significant construction project for MEDRAD. Work started this Spring by P. J. Dick on the 125,000 square foot MEDRAD Corporate Center in Tech 21 Research Park in Marshall Township. The building should house 260 employees when it opens in 2007.

## Wild Escape Park Announced in Wheeling

Attraction Management Services of Alta, Iowa announced in August that it would be developing a 100-acre, \$200 million entertainment complex along I-70 just east of Wheeling. The complex, named Crystal Mountain Wild Escape, will initially open a 40-acre theme park with 11 acres under roof. The project's developer, Steve Minard, sees the 12-month season as his principal advantage.

The Wild Escape park will be built in the Ohio County commercial district known as the Highlands, home to Cabela's and hundreds of thousands of square feet of retail and restaurant space. One of the advantages of the area for Wild Escape is the traffic generated by Cabela's and nearby Oglebay Park. Approximately four million people visit Cabela's annually with another two million visiting Oglebay.

The project is being designed by Omaha architects Carlson West Povondra. Construction is expected to start by early 2007.

## Legislation to Boost Green Construction in PA

By Jon O'Brien

The single highest barrier to building green is the perceived initial costs. While the higher initial costs are offset by annual savings in water, energy and waste disposal, a construction end user must first confront initial costs before looking years down the road. Legislation, on all levels of government, can improve upfront costs making sustainable construction a more attractive option, thus encouraging the construction of green buildings. The following are the highlights of pending federal and state legislation:

*High Performance Green Building Act of 2006*  
United States Senate Bill 3591  
Sponsor: Senator Jim Jeffords, Vermont

This legislation authorizes more than \$200 million to promote environmentally-friendly school and federal buildings. This bill would establish a new office at the General Services Administration (GSA) that would create a Green Building Advisory Committee, and analyze current budget and contracting practices that affect green buildings. The committee would also guide federal procurement executives on renegotiating proposed facilities design, existing facilities renovations, and eased

facilities improvements. If enacted, within two years, the GSA must identify all types of facility procedures that inhibit new and existing federal facilities from becoming a high-performance green building.

This bill did pass in the Senate Environment & Public Works Committee in mid-September, clearing the bill for consideration by the full Senate.


*High Performance Green Building Act - House Bill #3047*  
United States House Resolution 5931  
Sponsor: Congressman Mike Doyle, Pennsylvania

The proposed legislation improves green construction on three fronts. The bill requires all new federal building construction to incorporate the most up-to-date green building technology. Secondly, this bill expands existing federal research on sustainable construction. And finally, this legislation creates a green building clearinghouse to provide all interested parties with the latest green building research.

*High Performance Buildings Tax Credit*  
Sponsor: Pennsylvania State Representative Carol Rubley, Chester County

With the intention of promoting better energy and environmental standards for construction, rehabilitation and maintenance of buildings in Pennsylvania, this legislation provides the tool for an owner to receive tax credits for building a new or renovating a high performance building. The tax credits will be disbursed over a four (4) year period providing the building owner provides annual high-performance documentation after the completion of a high performance building. Eligible buildings include: residential multifamily buildings with at least four stories and 10,000 square feet of interior space; a building used for commercial or industrial purposes of at least 10,000 square feet; a combination of buildings with at least 30,000 square feet of interior space and a minimum of 10,000 square feet of interior space per building.

*High Performance State Funding Buildings Standards Act*  
Sponsor: Pennsylvania State Representative Carol Rubley, Chester County

This legislation purposes that the design, construction and renovation of buildings that receive state funding and are owned and operated by the Commonwealth comply with specific environment and energy standards. This bill could significantly reduce or eliminate the negative impact of the built environment in Pennsylvania. Each building's performance would be documented and verified by a third party. Furthermore, the Department of General Services will be required to submit annual reports on actual savings in energy costs and other potential environmental benefits for each green building. The monitoring and verification for each high performance building would continue for five years after the completion of the building. 



## REGIONAL MARKET UPDATE

Over the past two decades the Western PA construction and real estate market tended to lag the national market by 12-18 months. Since the top of the last building cycle in 1999-2000, the national trends and the regional trends in construction have been on the same rhythm. That observation is especially true through nine months of 2006.

Like most of the country the housing market in greater Pittsburgh has slowed significantly over the past six months. There are a couple of interesting differences about our market though. Unlike the national market housing activity in metropolitan Pittsburgh peaked in early 2004. Year-to-year comparisons of activity in 2004 and 2005 found a slight decline each year of 2-3%. Through mid-year 2006 the activity in the Pittsburgh seven-county region was down only 1.7% from mid-year 2005. Third quarter housing permits have slowed dramatically, bringing 2006 starts to a level that's more than 15% off last year's.

Sales of existing houses are also off in Western PA, although to a lesser degree than the national decline. According to Howard Hanna Real Estate Services there were 20,551 houses sold in the first six months of 2006 in the seven-county area. That represents less than half-percent decline compared to 2005. In the largest county of the area, Allegheny, sales were actually up almost 2%, to 12,920 houses sold. And the value of the homes sold actually rose 5.87%. Recent data indicates that the sales trend is slowing and housing prices have begun to slip from earlier in the year.

Since builders in Western PA are almost entirely small firms starting less than 20 homes per year, the quick change in the market is both anticipated and relatively good news. Pittsburgh's builders are too small to carry inventories of more than a few unsold

houses, so a quick correction in price and start activity indicates a commitment to clearing out inventory, which should prevent a downturn from lingering.

For the same reasons as the national market, construction of multi-family dwelling units is up in our region by over 40%. Likewise, contracting for non-residential construction is running well ahead of

### PROJECTS OVER \$50 MILLION CONTRACTED AUG-SEPT

Project	Location	Owner	Cost
North Shore Connector Tunnel Ph. 1	Pittsburgh	Port Authority	\$117,000,000
Headquarters Office	Southpointe	Consol Energy	\$64,700,000
Providence Point	Scott Township	Baptist Homes	\$100,000,000

last year's pace. Through September 30, non-residential contracting in the seven-county metropolitan area stood at \$2.3 billion, an amount that equaled all of 2005. If the normal bidding volume occurs in the last quarter contracting for non-residential buildings should exceed \$2.8 billion for 2006, which would represent a 20% increase.

What is unusual for this region is the distribution of the sizes of projects. During the past decade there have rarely been more than one or two projects \$50 million or larger in any one year. Between January and July there were five such projects started, including three projects over \$100 million. In August and September three more large projects were started, and at least two more are slated to start by

the end of 2006. While this kind of volume of \$100 million projects is not likely to be repeated in the coming years, it's worth remembering that another dozen or so projects over \$100 million are in planning.


Also affecting our market are several large power plant projects which are located geographically outside metropolitan Pittsburgh, but which are drawing from the Pittsburgh contracting and supplier market. Scrubber construction at Allegheny Energy plants in Hatfield and Martins Ferry are underway totaling \$400 million. New plants, almost all costing \$1 billion or more, are being planned for 2007 and 2008 in Greene County, Somerset, Washington County and Morgantown.

Not surprisingly, the major construction projects at the hospitals make healthcare the leading sector of the market. Construction of retail centers remains strong, and new manufacturing and warehouse buildings are ahead of last year's pace. Healthcare and industrial construction will remain strong through the remainder of 2006 and through 2007.

Requests for design proposals have dropped off in the past three-to-six month period, and hiring at

architectural/engineering firms has slowed. Firms providing architectural services to the senior living and continuing care markets are seeing increased activity, and have been increasing their hiring. In the broader non-residential market, however, slower architectural activity may be an indication of a contracting slowdown by late 2007 and 2008.

For the near term, however, private non-residential construction will remain above normal levels. Backlogs overall should remain high into next year, keeping labor relatively unavailable, and keeping pressure on pricing as contractors and subcontractors can be more selective in the projects they pursue. The public sector of the industry has been slower in 2006 than in past years. Since the contracting of public and private work is more segregated than in other markets it's expected that public contracting will remain competitive during the winter months.

As 2006 wraps up it will be instructive to watch for inflation to abate, for interest rates to decline slightly, and to observe if the pace of design proposals picks up or continues toward a slowdown. 

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## NATIONAL MARKET DATA

As autumn begins two issues with significant impact on the new construction market are coming into greater focus. The national housing market has experienced slower demand for long enough that the builders are aggressively reacting, and the dramatic increase in oil supply compared to Spring has caused a dramatic decrease in crude oil price.

New housing construction and pricing for housing have been on a double-digit rise for nearly two years prior to 2006. As was anticipated the market correction has been steep, especially in the middle months of the year, which are traditionally higher volume times for sales and construction. Construction of new houses which was expected to be off some 5% in 2006 may slip to lower activity levels, perhaps dropping off as much as 10% by year's end.

Demographic support for new housing is still strong, however, with unemployment still below 5%, and new household formation predicting increased home demand in 2007-2008. The slowdown in starts is a reflection of how quickly the builders and lenders are responding to the softer market. Unlike the mid-1980's when builders continued to start houses in a number of regions long after demand dried up, the market is correcting much sooner.

Another sign of the market's quick response has been the first signs of sales price decline overall. Sales of homes declined in August for the fifth straight month and the median home price declined for the first time by 1.7% compared to August 2005. National Association of Realtors President Tom Stevens is not overly concerned, noting "Contrary to many reports, there is not a 'national housing bubble'," he said. Instead, Stevens said the slowdown reflected cooling in some overheated markets, while other regions had never even known a real warm spell. "Markets in Florida, California, Arizona, Nevada, Virginia and Maryland have exhibited trends far above the local historical norm," he said, referring to areas that have seen some of the strongest sales and biggest price increases during the recent boom.

David Seiders, chief economist for the National Association of Homebuilders, predicted the housing market would bottom out "around the middle of next



year," and predicted that the slowdown would need to account for the two-year boom before new demand kicked in. Seiders was not concerned that the slowdown would trigger a recession, especially with declining energy prices and stable interest rates.

Non-residential construction on the other hand is reaching the peak of its business cycle, with increases of 16% for privately-funded contracting and 10% in public construction. Even with inflation of 8% in building materials the increase in non-residential contracting is strong.

Several sectors are showing remarkable growth, with retail buildings up 38%, hospitals up 27%, manufacturing up 24% and multi-family up 20%. Even office construction, which has been saturated for most of the decade is rebounding, up 12% year-to-date.

One other bit of good news is the flattening out of inflation at the end of summer. While building components and products are still running above 8%


more than last year, price increases in July and August combined were less than 1%. A continuation of that trend will help calm the nerves of many owners who remain nervous about the pre-construction estimates for their projects.

A recent survey by Ken Simonson, AGC Chief Economist, asked builders and developers if they had had any projects cancelled due to price inflation. Not surprisingly there were a number of affirmative responses that did indeed have some common threads. The cancellations were generally on larger projects, primarily in the condo or high-rise residential market, or in heavy/highway work. Also, nearly all of the cancellations were in markets that have historically, or recently, been overheated in demand.

A significant portion of the cancellations also came from markets which are actually still very strong, suggesting that the pricing may have been coupled with a lack of contracting or supplier capacity. A number of high-profile projects were scuttled or put on the back burner in Las Vegas, Southern California and Montana/Wyoming. These are very different markets but share the fact that construction demand is strongly outpacing the contracting capacity right

now. Additionally there have been cancellations in the energy sector, where demand for increased capacity is enormous, but the limited vendor market for equipment and related infrastructure has squeezed lines of supply and prices beyond what the projects can bear.

In another survey, done by Market Measurement Inc. for Pinnacle One, 166 public owners were contacted by phone and asked what the inflationary effect had been on their projects. The owners indicated that 19% of their projects had been delayed or cancelled due to costs. One-third said that fear of cost increase was causing them to plan to pre-purchase materials for next year's work.

In the 30 days or so since those survey results the cost of oil has retreated approximately 20%, which will offer relief to the cost of many construction materials, and all manufactured goods in general. If American consumers can continue to pare back usage while the worldwide supply of petroleum begins to increase the outlook for construction materials over the next six to twelve months is more favorable. 

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## WHAT'S IT COST?

Two interesting short-term market phenomenon are impacting construction costs in the region since mid-Summer. Tight labor supply and high backlog levels have reduced contractor interest in bidding projects, and drastically lower petroleum prices have stopped the runaway inflation effecting material prices since mid-Summer.


Construction projects bidding of late have shown the effects of the high contracting volume in the Winter/Spring months. Many contractors were able to "fill their bellies" before the mid-year, and even those that are still looking for work are finding that available labor is short enough to limit their ability to respond to opportunities in the next 90 days. These conditions are manifesting in the public market by reduced bidder volume in public work, with less than three bidders on many multiple trade contracts. Bidder response in the private market is more consistent, since declining an invitation to bid from a repeat customer is very bad marketing policy; however, the effects of the activity levels are showing up in terms of the competitive pricing, especially from critical subcontractors.

Thus far the less competitive response hasn't had a significant impact on project progress, other than an occasional multiple-prime contract re-bid. With few exceptions projects have been going ahead, even if budgets have been exceeded slightly. The same cannot be said on the national level, where 19% of public owners have indicated a delay or cancellation due to unacceptable cost increases.

This doesn't mean that costs for construction are more moderate in Western PA, but rather seems to indicate that the project owners have been more aware of the impact on budgets and prepared better for the increases. As the tables show, costs for new construction in the region are at all time highs for all building types. Building types which have the highest concentration of plumbing and electrical construction,

like hotels and hospitals, have borne the biggest increases, reflecting higher steel and copper prices. Projects which can be built with residential materials have fared better, as the housing slump is softening prices of those materials.

On a national level the pace of inflation for construction materials is still running well ahead of consumer and producer inflation. In July and August the Consumer Price Index and Producer Price Index rose .2% or less. The year-to-year CPI in August was 2.8%, with the PPI increase at around 4%. Compared to these inflation rates, the prices of construction components and products rose .7% in July and .4% in August. The increase in construction costs since August 2005 is 8.8%, more than double the PPI.

The good news on the horizon for construction prices, however, is that some of the materials driving inflation have begun to fall in recent months. Drywall, lumber, and construction plastics have been deflated by the housing dropoff, as well as several new plants coming on-line. Since August there has been a 20% decline in petroleum prices and 50% decline in natural gas from their high points, which points to declines next Spring in asphalt, diesel and energy costs. 

### Regional Cost Survey September 2006

Building Type	Cost/Sq. Ft. Range
Office Core & Shell	\$75-82
Retail Shell	\$60-65
Corporate Office Building	\$165-180
Church	\$150-190
K-12 School (New)	\$143-167
K-12 School (Renov)	\$100-128
Condominium	\$95-112
Single Family	\$70-102
Warehouse	\$45-65

### Percentage Changes in Costs

	to August 2006 from —		
	1 mo. ago	3 mo. ago	3 yr. ago
<b>Consumer, Producer &amp; Construction Prices</b>			
Consumer price index (CPI-U)	0.2	0.7	3.8
Producer price index (PPI) for finished goods	0.1	0.6	3.7
Materials and components for construction	0.3	1.2	8.8
<b>Costs for Inputs by Construction Types</b>			
Nonresidential buildings	0.6	1.6	8.0
Highway and street construction	0.8	2.7	13.8
Multi-unit residential	0.3	1.4	8.6
Single-unit residential	0.3	1.0	8.0
<b>Costs for Specific Construction Inputs</b>			
#2 diesel fuel	6.1	6.0	26.6
Asphalt	6.9	29.0	77.4
Ready-mixed concrete	0.0	1.9	11.9
Plastic construction products	0.2	0.8	20.1
Gypsum products	2.9	3.2	21.2
Lumber and plywood	-3.8	-9.0	-6.1
Steel mill products	1.2	9.2	23.3
Copper and brass mill shapes	-2.4	2.1	81.0
Aluminum mill shapes	0.1	0.1	15.6
Construction machinery and equipment	-0.1	0.0	3.2
<b>Costs for Basic Inputs</b>			
Crude petroleum (domestic production)	-1.9	3.3	15.7
Industrial natural gas	1.4	-4.3	-2.9
Plastic resins and materials	0.9	2.8	10.2
Construction sand/gravel/crushed stone	1.5	2.7	10.2
Cement	0.3	0.7	11.0

Source: Bureau of Labor Statistics, Compiled by Ken Simonson, Chief Economist Associated General Contractors

# Pittsburgh,

## Feature Story

"...If any one would enjoy a spectacle as striking as Niagara, he may do so by simply walking in Pittsburgh, and looking into hell with the lid taken off."

—James Parton, writer in *Atlantic Monthly*, January 1868

"Pittsburgh, without exception, is the blackest place which I ever saw."

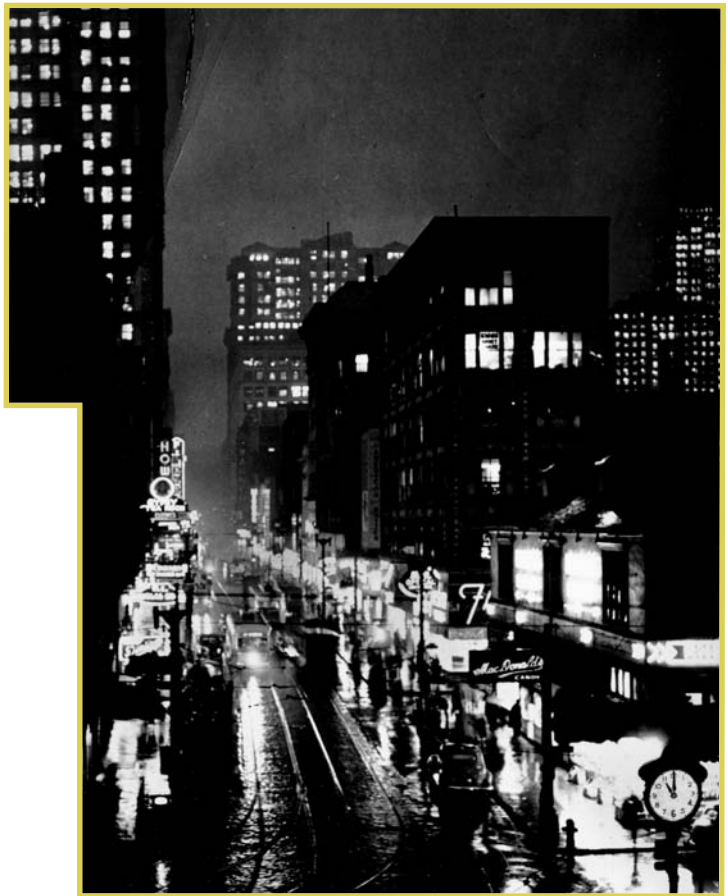
—English traveler Anthony Trollope, 1860

"Abandon it."

—Frank Lloyd Wright, when asked what he would do to improve Pittsburgh, quoted in *The New York Times*, November 27, 1955

It is our good fortune that it was David Lawrence's ideas, not Wright's plan that was the inspiration for Renaissance I. The quotes above are not exactly the stuff of regional economic development literature. It was, ironically, the fact that the very smoke that inspired these quotes also drove the economic engine of Western PA that made the place so difficult to clean up. There was the real fear that clearing up the smoke that earned Pittsburgh its reputation would also clear out the basis of its economy.

Pittsburgh's well-earned smoky reputation, however, was at odds even then with the fact that Western PA was also the home of some of the most visionary environmentalists. Rachel Carson wrote books that helped spawn the modern-day American



View of Fifth Avenue from Liberty Avenue on November 5, 1945 that shows the use of street lights during the day. Note the clock in the lower right that reads 11:00 a.m. Photo credit: Library and Archives Division, Historical Society of Western Pennsylvania.





# Gray to GREEN

environmental movement, and did so from Pittsburgh. David Lawrence, as Mayor of Pittsburgh, spearheaded legislation that eliminated coal-burning furnaces and reduced smoke. Even venerable names like Howard Heinz and Richard Mellon were among some of the earliest leaders of Teddy Roosevelt's conservation movement.

Perhaps it's not surprising, then, that a region that was one of the smokiest should become one of the "greenest" in America. The transformation from a place where streetlights burned at noon in its steel towns, to a region which is at the forefront of environmental responsibility was what moved the U. S. Green Building Council to hold its second Greenbuild Conference in Pittsburgh in 2003. "One of the reasons we chose Pittsburgh was that it was one of the two or three cities with the most LEED projects going on," said Taryn Holowka of USGBC.

Some of the earliest environmentally sensitive buildings in the United States were done in Western PA during the 1990's. Pre-dating the LEED standards established by the USGBC projects like CCI Eco Center were winning national awards as early as 1999. The Robert L. Preger Intelligent Workplace, built on top of Margaret Morrison Hall at CMU, was opened in 1997 and "a pilot project that people still refer to in terms of energy efficiency, productivity and healthy buildings," says Stephen Lee, Professor of Architecture at Carnegie Mellon University.

How did we clean up our act? The history of making Western PA one of the most environmentally friendly in America was written by politicians, activists, committed citizens, pragmatic businessmen, and lots of educators. Success came from perseverance and good fortune, with a little bit of economic disaster thrown in for good measure.



View of Oliver Avenue from Smithfield Street, September 25, 2006 at 11:00 AM.



View of Downtown Pittsburgh through the Liberty Tunnels before (1945) and after (1951) smoke controls were instituted. Photo Credit: The Carnegie Library of Pittsburgh.

Between World War I and World War II the city's leaders passed anti-smoke legislation that was aimed at cleaning up the skies. Before the effects could be seen the rules were put on hold so that production for the war effort was not held up for any reason. After the war the demand for manufactured goods put the region into high gear.

By 1950 then Mayor David Lawrence realized that while Pittsburgh was wealthy and on the move, the long-term prospects for livability were threatened by the damage being done to the environment. Pulling together business and civic leaders he rallied support for a variety of measures to clean up the city.

One of these measures nearly cost Lawrence his job. To make the biggest dent in the air pollution all homes and businesses were ordered to convert their coal furnaces to gas or another fuel that didn't produce smoke. 1950 was an election year, and Lawrence's opponent, Eddie Leonard, pounced on the economic hardship that switching from coal would cause and engendered support by running against smoke control. Under fire and in a tight primary race, David Lawrence chose not to back down from his positions.

While much of the city was divided over the issue the citizens in the poorest neighborhoods were not. Their support was enough to sweep Lawrence into another term. Later Lawrence looked back on that election as a corner turned by the city, moving toward an environment that was progressive for all its citizens.

The 1960's and 1970's saw changes in Western PA for the betterment of the environment. Downtown Pittsburgh became free of manufacturing. The

national awareness of air and water pollution wrought the Environmental Protection Agency, and its clean air and water regulations were imposed on the manufacturing plants that lined the Monongahela, Allegheny and Ohio Rivers, and their tributaries. Environmental education became integrated into the University of Pittsburgh's engineering and Carnegie Mellon's architectural curriculum.

The singular change that had the biggest effect on Western PA's environment also caused an economic scar that is only now beginning to fade. By the end of the 1970's foreign steel competition, outdated mills and overburdening labor arrangements led America's steel manufacturers, most of whom were based in this region, to opt to close down nearly all the mills in Western PA. Within five years almost all of the facilities used to make steel or to support its production were closed. More than 100,000 jobs were lost, and our region's economy was without an anchor.

Before all the mills had even closed, however, it was becoming obvious that the economy of Western PA was changing. As service-based businesses in finance, and later computers, flourished, demand for

## LEED Benchmarking Data

Metro Pittsburgh	22
Seattle	20
Portland	18
Atlanta	14
Chicago	12
California	70
Pennsylvania	45
Washington	44
Oregon	35
Michigan	30



high-rise office buildings created the construction known as Renaissance II and III. Emerging technologies in computer software, engineering and healthcare helped grow Pittsburgh's two largest universities. By the end of the 1990's Western PA bore little resemblance to its image of the 1950's.

One of CMU's growing educational focuses was on energy efficient and sustainable design within the School of Architecture. In 1988 the Advanced Building Systems Integration Consortium (ABSIC) was formed at CMU as a private industry-government-education collaboration to research and test products and technologies to improve the performance of commercial buildings. ABSIC functions as a living lab for graduate research under the guidance of five CMU architectural professors. The Robert Preger Intelligent Workplace was constructed between 1994 and 1997 and still provides groundbreaking research on emerging green technologies.

1993 proved to be a watershed year for the environmental community. On Earth Day in April, President Clinton announced the "Greening of the White House" project to make the President's residence a model of efficiency. The three-year project, which included the Executive Office Building, resulted in renovations that saved \$300,000 each year in energy costs, and reduced the White House's carbon emissions by 845 tons per year.

In Pittsburgh that year, three existing non-profit environmental groups merged with a handful of architects, engineers and contractors to form the Green Building Alliance. At the same time the Heinz Family Foundation hired William McDonough to design a renovation to their offices that was environmentally sensitive. McDonough, a pioneer in sustainable design, created an office that inspired Teresa Heinz to become a champion for green practices. The contractor, Mascaro Construction, also came away from the project as a disciple of green building.

Also in 1993 the United States Green Building Council was formed to promote green practices nationally. One of their most enduring



*REI's South Side Works Store, a rare LEED-certified retailer.*

accomplishments was the creation of the Leadership in Energy and Environmental Design (LEED®) Rating System, which was put into place in 2000.

Greater Pittsburgh did not wait for LEED to take the lead in green building. By the late 1990's dozens of green buildings had been constructed in Western PA. The Heinz Endowment sought to kick start the promotion of sustainable practices in the industry and agreed to fund the hiring of Rebecca Flora as Executive Director of the GBA. A tireless advocate of green building, Flora met with almost anyone who was interested in building green. It was just such a meeting with PNC's Gary Saulson that resulted in the decision to pursue LEED certification for PNC Firstside Center, which was under construction. At 647,000 square feet it was the largest LEED Silver building when completed.

Gary Saulson became such a believer in the value of LEED buildings to PNC's mission that all construction since then has been LEED-certified. PNC is poised to become the first company to qualify for bulk certification for its prototype branch design, a breakthrough that will open doors for retailers to build green, and get LEED certification.

Perhaps the pinnacle of this period in Pittsburgh's green history was the construction of the David L. Lawrence Convention Center. When opened in 2003 it was the first green convention center, and at 1.5 million square feet, the largest LEED Gold building in the world.

Later that year Jack Mascaro, along with the Heinz Endowment and the Bevier estate, funded the Mascaro Sustainability Initiative for engineering at the University of Pittsburgh. MSI funds research aimed at initiating and nurturing research and education in the research thrust areas of green construction and sustainable water use.

### Where the Points are in LEED

Category	Possible points (% of total)	
Sustainable sites	14	(20%)
Water efficiency	5	(7%)
Energy/atmosphere	17	(25%)
Materials/resources	13	(19%)
IEQ	15	(22%)
Innovation	4	(6%)
Accredited professional	1	(1%)
<b>Total</b>	<b>69</b>	<b>(100%)</b>

Source: USGBC

### LEED Certification Levels

Rating	Earned Points
<b>Certified</b>	<b>26 - 32</b>
<b>Silver</b>	<b>33 - 38</b>
<b>Gold</b>	<b>39 - 51</b>
<b>Platinum</b>	<b>52 - 69</b>

Source: USGBC

Looking back at more than a decade of accomplishments, brownfield conversions, the urban trails, the Community Bike Program, Sustainable Pittsburgh, and others, one could feel comfortable with this region's leadership role in green building. Rebecca Flora does not feel so comfortable. "Green building is growing everywhere," Flora says, "and while that's great I'm worried that other cities will just rush past us."

The size of our market does make it possible for a much larger city to have more LEED-certified projects, even if their share of LEED projects is much smaller. How important is that leadership role? "Our region is about to land a large project because the owner wants to be someplace where business is environmentally responsible." Flora is convinced that our green leadership can be the region's differentiating quality, one that will attract more businesses than government incentives.

To keep that leadership role the GBA continues to push regional initiatives that will separate Western PA from other cities.

In November GBA will lead a green building products initiative to undertake research, testing and benchmarking for products to be used in sustainable projects. There are no current LEED standards for individual products, which makes it difficult to differentiate between sustainable products and those that are marketed "green."

GBA has also facilitated the creation of a Green Government Task Force to be co-chaired by Mayor Ravenstahl, Councilman Peduto and Senator Ferlo. The task force will act as an advisory committee in the creation of a Local Action Plan for the ICLEI's Cities for Climate Protection Campaign. The campaign aims to set standards for air and water quality that can be used for future development.

For those who have lived in this region since World War II the transformation of the environment in Western PA is nothing short of miraculous. Growing up near dead rivers, with perpetually cloudy skies, someone in their 70's probably couldn't imagine Western PA with clean air, fish in the rivers and green all around. For the countless professionals who have labored the past 40 years in defense of the environment the payoff will be when some future generation can't imagine Western PA without those things. **BG**





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# Project Profile

## Regional Learning Alliance Conference Center at Cranberry Woods

850 Cranberry Woods Drive  
Marshall Township

One of the more interesting and unique efforts to continue the education of Western PA adults in support of economic development is the Regional Learning Alliance (RLA). Sparked by officials at Slippery Rock University the RLA evolved as a concept from continuing education into a multi-faceted learning source, which could be offered for

corporate and community training, and conferences. As the uniqueness of the concept unfolded it was clear that the idea of the RLA would best take form in a new, dedicated facility.

In the end the RLA identified its mission this way: To be the premier Learning Center, capitalizing on the resources of a regional alliance of educational institutions, as well as the region's foremost Conference and Training Center that utilizes the combined strengths of the educational partners and workforce development providers, working together to enhance the individual, corporate, and economic vitality of the region.

As the form of the RLA was being shaped Mine Safety Appliances stepped forward and offered to donate a site within its campus in Cranberry Woods.

That site would allow the RLA Center to be within an hour's drive of anyone who lived in the region, at the same time providing an environment that most colleges would envy. The pristine nature of the Cranberry Woods park created another directive for the design and construction of the facility: building it green.

Designing and building LEED-certified educational building or conference centers was not new. These kinds of facilities have been among the more popular end uses for green buildings. But the RLA Conference Center was actually going to function more like a commercial building during the day, creating design demands as the building needed to transform from something akin to a hotel by day into a college by night. Architects had to create the flexibility to accommodate the diverse operations for educational use, while building to the standards and expectations of the business community and the requirements of the International Association of Conference Centers (IACC). Their accreditation was extremely important to the success of the day business at the RLA because research showed that no facility in the Western Pennsylvania had this accreditation or was built to their high standards of operation, technology, and amenities.

Mark Weber, project architect for Renaissance 3 Architects, said "The project was unique due to the fact that the operational scope and purpose had never



Main entrance of the Regional Learning Alliance Conference Center.  
Photo by Ed Massery.



been done before anywhere in the country. There was no model or benchmark to follow. The project in itself became a model in design, construction, application, and facility utilization with as diverse an identity as could be imagined." Aside from design issues the hybrid nature of the building meant that local and state codes had to be understood to apply to the building in new ways. Since the project predated the state-wide building code adoption that meant satisfying the code officials in Marshall Township, Allegheny County and PA Labor & Industry.

Beyond the code issues resulting from a hybrid building the processes and materials needed to achieve LEED Silver rating caused hiccups in getting approvals. In several instances meetings and appeals had to go all the way to Harrisburg for approval in the use of materials in the facility because they were so radically new to the local area. And the owner's decision to leave all forests and wetlands untouched removed flexibility for locating the building on the site.

## Project Team

Renaissance 3 Architects  
Landau Building Company  
Zimmer Gunsul Frasca Partnership  
Barber & Hoffman, Inc  
Tower Engineering  
Mackin Engineering Company

One unexpected challenge came when the County Health Department would not accept the dual flush toilets and waterless urinals that were designed to meet the reduced water usage plan. The design team had to convince the Department that such fixtures were not a health problem. This was the first instance in the county that the dual flush toilets were used in a commercial facility.

None of these obstacles were insurmountable, but solutions to any of the problems were also impacted by an unreasonable schedule and an ever-shrinking budget. The ultimate success of the project was only possible through total cooperation, says Sam Ward, Project Manager for Landau Building Co. "It took a lot of effort to get everyone on board throughout and keeping the process clear," said Ward, "but the architect did a great job of getting everything in the documents."

The experience of the team helped. Mark Weber had been involved in sustainable design for more than a decade, Landau had experience with green buildings, and Sam Ward had been the Project Manager for CMU's Preger Intelligent Workplace project while he worked for TEDCO in the mid-1990's. Many of the

## Project Details

Size: 2-story, 75,500 sq. ft.  
Cost: \$11,500,000

LEED Features: Stormwater is retained on the xeriscaped site that eliminates the need for irrigation systems and maintenance. Other features include waterless urinals, dual-flush toilets, white roofing, low-VOC materials, recycled carpet, certified lumber, HVAC designed to exceed ASHRAE 55-1992 purchase of green power, sunscreens, 96% construction waste recycling

subcontractors, however, had no experience working on a LEED-certified project. "We had great forms to help the subs hit all the requirements each would need to meet," says Ward. "The team helped the unfamiliar subs by doing a lot of up front work identifying suppliers to help them."

While the upfront approvals and design process stretched beyond what was anticipated the RLA steadfastly clung to its September 2005 opening date. One of the byproducts of the collaborative nature of this project was the flexibility it created within the team. Landau started construction of the 75,500 square foot building October 15, 2004 and presented a completed building for use on August 24, 2005. As tight as the schedule (which included a complete redesign of the HVAC after work started) was, the budget was tighter still.

All the sources of hard capital had not been completely identified at the time the work began, and four months into the job, in February 2005, the owner learned a grant was going to be \$762,000 short of what was expected. Using the resources of the entire team, Weber was able to design changes that found the extra budget without reducing program or size. In fact, the project ran smoothly enough that in April 2005 the team felt comfortable enough to use contingency funds to include some "wish list" extras, and the project still came in on budget.

The finished product is a building which brings the natural surroundings into the public spaces, and includes numerous outdoor/indoor spaces. Justin Griffith, General Manager of the Conference Center, observed "there aren't a lot of con's about this building. We're still working out some comfort issues in certain rooms, but the building rents itself." The natural light, open spaces and amenities make marketing the conference center easier.



*The main conference hall at Regional Learning Alliance.*

Mark Weber notes "there is a commitment from the staff to using green practices even after the building opened." Weber was guiding a group of visitors through the facility recently when one asked if the building was still operating "green." One of the cleaning staff was nearby and Weber decided to see what was on the supply cart. "It was a bit of a risk, but I was prepared to respond either way. The cleaning person was great. She was so enthused

## Educational Partners

Art Institute of Pittsburgh  
Butler County Community College  
Carlow College  
Community College of Allegheny County  
DeVry Institute  
Geneva College  
HeartPrints Center for Early Education  
LaRoche College  
Pennsylvania Cyber Charter School  
Penn State Beaver and New Kensington  
Campuses  
Pittsburgh Technical Institute  
Robert Morris University  
Slippery Rock University  
Strayer University

that she starting telling them about all the different cleaning products and the recyclable materials they used!"

Griffith echoes that enthusiasm. "We still have things to improve on, but this is such a great facility to show to people. It's really easy to get prospective users interested when they see the great light in the place, and hear about how many aspects of the building show a responsibility to the environment." [BG](#)



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# Firm Profile

## PNC Financial Services

In the world of corporate image and branding, color plays a significant role in fixing a corporate identity in the minds of its customers and consumers. In light of its historical competitors' colors, then, it may surprise to see how PNC, the "big blue" of the regions' banks, would become so "green."

With about 1,000 buildings and 25,000 employees in 31 states, PNC doesn't fit the stereotype of the kind of firm that owns and builds green. Museums, nature centers and universities build green, not big publicly-traded corporations. And make no mistake, PNC is a big business, with 2.5 million customers, \$63 billion in deposits, \$21.5 billion in market capitalization and \$506 billion in assets under management. Decisions that would change the corporate culture, like practicing environmental responsibility, must be filtered through an analysis of how the shareholder will respond.

It helps that investors are increasingly interested in a company's sustainable practices, as well as their financial practices. It also helps that PNC has developed a model of environmental responsibility that adds to the bottom line.

"We decided to go green because it was the right thing to do; it was good for our employees and our customers," says Gary Saulson, Director of Corporate Real Estate for PNC. "In going green, though, we were forced to examine every decision we made about our buildings and in that process we made a lot of good decisions that saved construction and operating costs."

PNC had its first chance to make an environmental impact in 2000 during the construction of the FirstSide Center. After the project had already been designed by Astorino, Saulson had a meeting with Rebecca Flora, Executive Director of the Green Building

Alliance, who made a persuasive argument for building FirstSide to LEED standards. Changes were made to the plans so that the 647,000 square foot building, built by Dick Corporation, was certified LEED Silver. It was the largest LEED silver building in America when completed.

Some five years after it opened FirstSide operates 25% cheaper per kilowatt hour than the similar 441,000 square foot Eastwick Operations Center in Philadelphia which is not LEED-certified. The lessons learned at FirstSide were applied to the 113,000 square foot PNC's J. Richard Carnell Center/PFPC Headquarters in Wilmington DE, a LEED Gold building, and will be used to guide the design and construction of \$170 million Three PNC Plaza in Downtown Pittsburgh next year.

PNC's biggest impact on green building actually has a much smaller footprint. For the past few years PNC has begun building branch banks that are LEED-certified, and are in the final steps of working out "bulk certification" approval from the USGBC for a prototype design being used for new branch construction. The branches, designed by Gensler, are only 3,650 square feet. What's big about these branch banks is that the bulk certification will open the door to an entire sector, retail, that has historically not qualified for LEED.

Retailers aren't environmentally neglectful, by the way; in fact, several retail chains have cultures built around environmental responsibility. Companies like Starbucks, Ben & Jerry's Ice Cream and Target have investigated LEED certification, but the process was not convenient. LEED certification is built on a third-party reporting system which is inherently unique to a specific project. Establishing, and paying for, independent LEED documentation for each of its new coffee shops would add hundreds of thousands of dollars each year for Starbucks, and likely delay store openings on every project. PNC and USGBC have arrived at a solution where the building features and processes that qualify a project for LEED certification can be repeated through prototype design and process documentation that can be verified through auditing. If successful this "bulk certification" will grow the number of LEED-certified buildings exponentially.

Since 2002 PNC has built eight new green branches which were individually designed to LEED standards, and another 21 which have been built or are being built to the prototype design. The prototype produces a building which looks like a branch bank, frankly, without a lot of obvious green features, aside from the amount of glazed surfaces. But again, the design process afforded an opportunity to approach branch construction anew.



*Southern elevation of PNC Firstside Center in Downtown Pittsburgh. Photo by David Denoma.*

"We looked at the branch's activities, and what our customers actually did in a branch bank," Saulson said. "For example, we had a standard size water heater that we wouldn't have questioned if we weren't looking to make economically conservative decisions. What do people do with hot water in a branch bank? Well, mostly they wash their hands. We didn't need 10 times that hot water capacity for hand-washing."

PNC's prototype is not only sustainable, but also cost-effective. The prototype design reduces construction time by four to six weeks, and the building's materials allow construction to continue during adverse winter weather. Using brick panels reduces jobsite waste disposal. Each new branch costs \$100,000 to \$150,000 less than what competitors are paying for their branches. And the energy model for the prototype produced a savings of 40%. Four of those branches have been built in southwestern PA by P. J. Dick, in Adams Ridge, Nebo Pointe, Pittsburgh Mills and Greengate Centre.

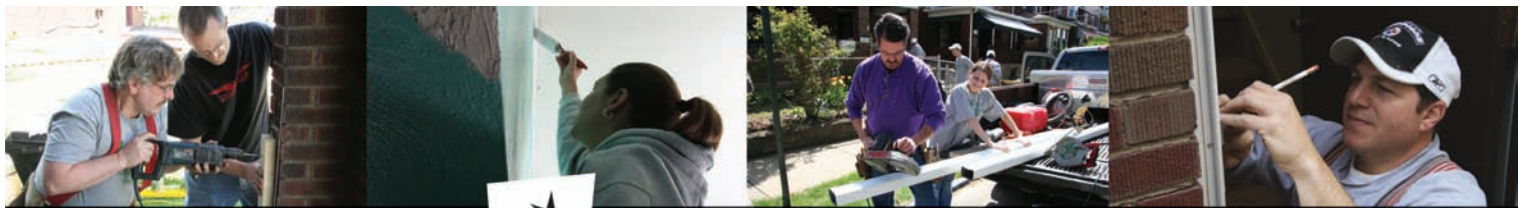
The impact of the decision to build and operate its facilities sensitively to the environment can be felt beyond the real estate bottom line. PNC employees working in LEED-certified buildings have responded to the improved work environments with increased productivity and significantly lower turnover and absenteeism, as much as 50% lower in the processing and operations centers. Anecdotal evidence suggests that the green workplaces also are more comfortable for those with allergies and asthma, and that employees leave work feeling less fatigued at day's end.



Entrance elevation of PNC's Nebo Pointe branch in Ohio Township.

Since 2001 PNC has gotten much healthier as a corporation. Early in CEO Jim Rohr's tenure the company's performance was under siege by federal regulators and shareholders. Rohr took his lumps from Wall Street, but persisted in reorganizing the corporation's management and operations. By October 1 of this year PNC's stock price had risen above \$73 per share, more than double its 2002 low.

PNC Financial Services, the bank many in the region remember as Pittsburgh National, would still like the consumer to think blue when he or she thinks of PNC. But, as the corporation with more LEED-certified buildings than any other in America, PNC is working hard to be the "green" bank as well. **BG**



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# Legal Perspective

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## It's Not Easy Being Green – Legal Issues Impacting Green Construction Projects

D. Matthew Jameson III

While “green construction” is one of the fastest growing segments of the construction industry, the law has yet to react to this emerging market. The law typically is reactionary – in other words, once clients experience legal problems, case law, statutes, and standardized contracts evolve to address those legal problems. The entities that successfully avoid legal problems on green construction projects will be those that accurately foresee potential problem areas and proactively address them, instead of waiting for the reactionary legal response that will eventually occur. This article will touch on some of the proactive steps that parties can take to avoid legal problems. Specifically, the article will discuss some of the potential problem areas that parties should consider when drafting their contract documents for the project.

As they currently exist, none of the major standardized construction documents (i.e. – the AIA, AGC, or DBI contract documents) address issues unique to green construction. Parties should therefore consider revising these agreements to address the following unique legal issues posed on green construction projects. First, delay clauses should be revised to address delays caused by late delivery of materials required for green construction. While “no

damages for delay” clauses are frequently accepted in the industry, this type of clause can have heightened significance on green construction projects. Unlike typical construction, where contractors often have numerous different options for acquiring materials that meet the needs of the project, green construction projects frequently specify unique products that may only be available from one or two different manufacturers. Parties should anticipate the possibility of these delays and address them in the contract documents.

Second, owners and contractors should consider including a contractual provision that adds incentives



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## Green Advantage Certification Seminar

Hosted by the Green Building Alliance and sponsored by the MBA, a Green Advantage Certification seminar will be held on November 9th at the Regional Learning Alliance in Cranberry Township. The purpose of the Green Advantage Certification is to staff your project with construction field personnel who have

demonstrated knowledge in green building practices and LEED. An exam will conclude the full day seminar and, upon passing it, an Innovation Credit will be available if a contractor's workforce consists of over 30% Green Advantage Certified individuals at the time of commencement of construction.



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for the contractor to contribute to the owner's green construction goals. For example, on most green construction projects, it would further the owner's green construction goals if the contractor could (1) demonstrably reduce the volume of construction waste generated on the project, (2) use alternative fuels to operate equipment, or (3) offer value engineering ideas that add to the green nature of the project. Yet, the contracts for most green construction projects fail to add incentives to the contractor to achieve these goals. Parties should consider amending their standardized contracts to provide these contractual incentives.

Third, from the owner's perspective, one of the primary goals of going with a green design is to achieve certification, be it LEED, Green Globes, or some other green certification. Given this primary goal, parties should consider penalty/incentive clauses that specifically address this goal. For example, just like a school owner may want to include a liquidated damages provision regarding the project completion date, in a design build contract, an owner may want to consider a liquidated damages provision regarding the level of green construction certification that is desired. This concept is particularly worth considering where an owner is receiving tax credits for green construction – the taxing authority may pull those credits if the represented level of certification is not actually achieved.

Fourth, parties should closely review the coordination provisions of their contract documents, since submittals and mock-up samples take on added significance in the area of green construction. Again, because so many of the products in the green construction market are new, owners will want to closely evaluate submittals and mock-up samples, possibly causing delays to the project. Therefore, instead of agreeing to "reasonable" or "as soon as possible" contractual turn-around time for submittals and samples, parties should consider agreeing upon a set number of days to avoid disputes.

While green construction will likely continue to expand its place in the construction industry, the parties that will successfully integrate themselves into this market will be the ones that can minimize negative legal impacts. The most important point, therefore, is to carefully consider the unique risks and issues that the green construction project may present and address those risks up front in the contract documents for the project.

*Matt Jameson is a Shareholder and chairperson of the Construction Services Group at Babst Calland Clement Zomnir PC. BG*

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# Financial Perspective

## How Expensive is Building Green? Well, it depends...

Building green has changed significantly over the past fifteen years. What has been consistent is that it is good for the environment to use sustainable practices and products on a project. Trying to get a handle on what, if any, additional cost there is for the environmental responsibility is harder to do.

It has been the common perception throughout all parts of the industry that building green will cost more, and that it is something worth paying for. The truth is there are many ways in which you can pay more for the choices you make during a green project. Many of the materials that have been associated with sustainable products have either supply or demand issues that make them more costly. The purely "green" products can be unfamiliar to the installer, adding to labor costs. Commissioning and LEED documentation can add a couple of points to the project cost. The extra demands placed on the designer may add to his or her fees. And systems chosen for their life-cycle benefits almost always cost more than the commodity end of the product offering.

While all of these things can add to a project's all-in budget it's important to remember that none of them necessarily do. It's likely, in fact, that almost all of these factors can be planned for in a way that eliminates the extra cost. Like all endeavors in life, extra effort during the planning can translate directly to the bottom line.

According to Gary Saulson, Director of Corporate Real Estate at PNC Financial Services, planning a LEED-certified building properly should save you money from day one. "I don't think there has to be any first cost difference," says Saulson. "Let me give you an example. I built a new house last year...and told the builder that his standard HVAC equipment wasn't efficient enough. Carrier's top of the line was very efficient and paid back in 15 years, but their next model down in efficiency paid back in three years. Now was choosing that model a 'green' decision or a good business decision? Either way, I didn't increase my budget; I just made more good decisions."

PNC, which has commissioned a prototype Gensler design for its new banks, spends \$2-3 per square foot less on its branches. The reduced operating and life-cycle costs accrue on top of the construction savings.

One of the main residual benefits of the decision to pursue a LEED certification is that it should force an integrated design and construction process for all the professionals. It's possible that one could approach a green project the same way as always and just make cost-adding decisions to reach LEED standards, but it's not likely. The practical reality is that planning for an environmentally low-impact project will force the team to identify better practices throughout the job. For example, recycling demolition waste adds LEED points to the Materials and Resources category, but it can also offset other costs. When the Tennessee Titans built their new stadium their material recovery revenue was \$500,000.

...Like all endeavors in life,  
extra effort during the planning  
can translate directly  
to the bottom line...

Alan Traugott is a principal at CJL Engineering, coming here after 25 years with Flack & Kurtz Engineering in New York. As a founding member of USGBC he's seen how familiarity has made it easier to do green projects over time. "Our experience nowadays is that doing basic LEED certification just doesn't cost any more, including up to LEED silver," says Traugott, "There are increases in soft costs because of commissioning, and it's more rigorous on the design side, with more research and modeling, but there are cost savings to be gained from those as well."

It seems that design and construction professionals in Western PA would agree. In a 2004 survey conducted by the GBA 88.3% of the respondents said that the cost of a LEED building was comparable or only slightly more than one that wasn't LEED-certified.

Another recent study addressed the profitability of sustainable design projects from an architectural standpoint. Hellmuth Obata Kassabaum has been a





leader in sustainable design worldwide. HOK's Director of Sustainable Design, Mary Ann Lazarus, wanted to know how much less profit was made on their green projects, fearing that the projects might routinely lose money because of the time involved. Studying the results on 15 LEED-certified projects, HOK found that their work averaged 25% higher profit. Without quantifying why this happened (motivated clients, better design focus, bigger institutional budgets), Lazarus was satisfied that a sustainable design was not a drain on profitability.

In an integrated design process the owner will get the opportunity to make decisions about the project that focus more on the building's operations than in a more linear process. Understanding paybacks on energy consumption and employee productivity will help owners make decisions with long-term cost implications. One area to be wary of in the process is the maintenance of systems. Some of the energy saving solutions for the mechanical and electrical systems can invite more complicated equipment to the project. "I still tell students about the KISS principal," says Stephen Lee, CMU Professor of Architecture, "Simple solutions often work just as well as complex systems for saving energy."

It's very difficult to anticipate the ongoing maintenance needs during the design of a customized heating solution. One successful LEED-registered project that is still working out the mechanical systems is the Regional Learning Alliance in Cranberry Woods. The project had a budget that was lower than comparable buildings and a schedule that was tighter than average. The building opened on time and under budget and is anticipating a Silver rating.

"We have the heating bill of a 5,000 sq. ft. house instead of a 76,000 sq. ft. office building, but the savings have been consumed by the extraordinary amount of HVAC repairs," says Justin Griffith, General Manager of the RLA. "I wouldn't have asked much about ongoing maintenance expense if I had been here during design, but I will on future projects."

As a green building, however, the RLA's conference Center is more attractive than others to prospective users. Commercial buildings, which rely on rent to

perform, provide the toughest test for the cost/benefit analysis of LEED standards. According to Pat Sentner, Principal at NAI Pittsburgh, green buildings "absolutely have an advantage. I have yet to see a tenant not like the idea of an environmentally-friendly building." Green buildings give tenants "a healthy building with features that are wildly popular." But, says Sentner, "I haven't seen a tenant who's willing to pay a premium for them yet." Office tenants benefit dramatically from a green environment, but planning for a LEED-certified office means integrating competitive lease rates into the model.

Beyond the upfront costs of construction, the operating costs and the maintenance expense, owners now need to consider another significant cost factor, government incentives. Like Tax Incremental Financing, the tax incentives or density bonuses for green construction can be enough to make a difference in a project's viability. Tax incentives are in place in four states and four municipalities currently. The incentives vary but usually involve a tax rebate as a significant percentage of the project cost or a reduction in property tax. In Nevada, where construction is booming, projects rated LEED Silver or higher can receive a 25% tax break. Density bonuses,

which are in place in only two cities right now, allow developers to build more space for lease, increasing the rental income in areas where demand exists.

Coincidentally, both of these kinds of incentives are being considered locally now. Pittsburgh City Council is considering the Sustainable Development Bonuses Bill, which will allow for higher-density in a LEED-certified development than normal zoning does. State Rep. Carol Rubley has introduced legislation providing for tax credit for LEED-certified buildings.

It's still important to come back to the cost benefits after construction, however. USGBC is working on an initiative to create a national database of all the human resource benefits associated with green buildings, including employee retention, health care, absenteeism and the resultant productivity gains. The importance of such data is in the numbers, according to Alan Traugott. "Energy costs make up a couple or three bucks per square foot in a building. If you save 50% that's maybe \$1.50 per square foot each year, not chump change; but, people cost an employer between \$125 and \$400 per square foot, depending on the business. If you can pick up just one percent that's more than the energy savings, and real productivity gains can mean big dollars." **BG**



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# Management Perspective

## The Owner's Decision: Green Versus LEED

By Jon O'Brien

Sustainable construction has entrenched itself in life's mainstream. It makes sense to ensure that environmentally-responsible buildings are constructed, especially when buildings consume 36% of the energy and more than 68% of the electricity used in the United States annually. One of the most effective ways to reduce operating costs over the life of a building is to optimize energy efficiency in buildings – and that's precisely what two local unions did.

Although neither the Greater Pennsylvania Regional Council of Carpenters nor the Operating Engineers Local 66 designed their new headquarters to meet LEED Certification, both unions made concerted efforts to implement many green building principles into the design and construction of their new headquarters.

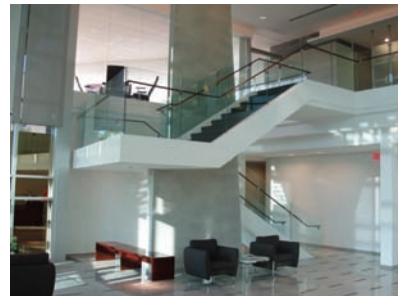
From the start, Carpenters Executive Secretary Treasurer Jack Brooks and Operating Engineers Business Manager James Kunz, Jr. made decisions guided by a green mind-set.

"Early on I worked with Massaro and the design professionals to assess the value and benefits of implementing green principles, and I discovered that a green design is a good design," said Brooks. "The benefits of going green are real, plus it's the right thing to do for future generations."

The Carpenters consulted with Massaro Corporation about their building, which is located in Collier Township. The 34,000 square foot facility will also house the Builders Guild and Carpenters Combined Funds Office.

The Operating Engineers Local 66 will now be headquartered in the O'Hara Township RIDC Park. Under the direction of Mascaro Construction Company,

*Main lobby at the Operating Engineers Local 66 offices in RIDC Park in O'Hara.*



a 35,000 square foot building was renovated. The Local 66 main office will also house District #1 and the Operating Engineer's Funds Office.

Both unions performed extensive interior and exterior renovations, with the primary goal to significantly lower energy consumption and costs compared to their previous headquarters. A major reason for both unions to implement green into their facilities is that enough time has lapsed to prove that there are financial advantages of going green.

"Building owners must be proactive from the start to protect their investment," said Kunz. "Sustainable practices are the key to adding value to any facility and it's also a powerful demonstration of civic responsibility."

Similar interior renovations were conducted by both the Carpenters and Operating Engineers. Both buildings optimized natural lighting, creating a more relaxed atmosphere for employees and reducing energy output. Motion sensors controlling the lights were installed throughout both buildings, along with temperature and humidity gauges, which regulate and adjust to a room's current condition.

The existing HVAC systems were value-engineered to reuse efficient elements and upgrade certain equipment. HVAC upgrades were conducted to increase air-circulation and moisture controls in both locations. When all interior renovations are considered, both unions expect to use around 40 percent less energy than their former buildings.

Minor roof renovations were done on the Operating Engineers building to keep surface temperature down, a temporary solution to prolong the roof life. Both unions improved the landscape around their respective buildings for cosmetic reasons and to also absorb heat. In addition, measures were taken by both unions to reduce storm-water runoff.

Inside and out, modifications were made with benefits to the environment. However, intangible benefits exist for the employees, which include working in natural light and ventilation, compared to the former dilapidated buildings that featured the humming glow of fluorescent lights.



*Reception area at the new Greater Pennsylvania Regional Council of Carpenters office.*

Along with improving the efficiency of the headquarters, renovating green enables the two unions to gain a competitive edge. More and more owners are contemplating building green, and it's reassuring for an owner to know that their project is in the hands of a sophisticated workforce that practice what they preach.

"The green construction movement has gone full circle from environmentalists trying to save the planet to the Building Trades Unions becoming a steward of sustainable construction," said MBA Executive Director Jack Ramage. "The green future is here and flourishing in the Pittsburgh area, and the MBA's workforce has positioned itself to become the preferred builder for development in our region."

Yet, building a project with sustainable practices isn't the same as LEED certification. In some ways the argument is a little like the philosophical question of the tree falling where no one can hear. Those who push for LEED certification compare it to Underwriters Lab for consumer products: you can design a product to the highest safety standards but if UL hasn't tried to burn it or crush it, it isn't UL approved. Owners who pay strict attention to LEED standards but choose not to invest in the certification process counter that not having a plaque on the wall doesn't diminish their building's performance.

One of the trends that may erase the line between green and LEED is the continuing evolution of LEED accreditation. As the incentives for LEED-certified building grows the demand for LEED-accredited professionals has also. The accreditation has reached a critical mass of participation with over 25,000 accredited professionals. The standards have been evolving to attract involvement from all sectors as well.

According to USGBC's LEED Director Tom Hicks, accreditation "changed in 2004 in that we updated the exam to more closely align with the industry." Hicks says,

"Next, we plan to have the AP exam branch out into tracks to make it more applicable to various professions in the building industry – (ex: interior designers and facility managers). So a person will still be an AP but they will be able to choose which track of the exam they want to follow, to make it more applicable to their professional field."

Broadening the accreditation tracks and making the testing more rigorous will ensure that involving LEED AP personnel on the project will ease the certification of the project. Local contractors have seen the change and adapted. For example, Massaro Corp. recently sent 12 project managers through accreditation. Said company President Joe Massaro III, "We did it because LEED isn't going away and we want our people to be trained to contribute to the design, if necessary, and take the right steps to bring value to the whole process." Massaro now has all of its PM and preconstruction staff LEED accredited. "If we're working on a project early at least two Massaro people involved will be LEED accredited," says Massaro.

Green Building Alliance board member Michael Kuhn stresses that having another LEED-accredited member on the team helps "to address problems during construction that might effect the paperwork and the LEED certification." As a project manager for Jendoco Construction Kuhn has seen the marketing advantage as well. "Owners are increasingly aware that having a contractor with a LEED professional can make the project go smoother." Contractors are now seeing RFP's more regularly with LEED requirements included.

Where in past the LEED process could have become another adversarial issue between the three parties to a project, contractors are now pulling in the same direction with LEED accredited project management. Says Kuhn, "There's no question in my mind that having an AP pro on staff will help get the project certified." And that will continue to make it easier to make green become LEED. BG

## LEED® and Green Globes™

Since 2000 the USGBC has maintained a rating system which is based on a rigorous third-party verification process. While USGBC has constantly worked to make the LEED process more stringent and reasonable at the same time it was probably inevitable that a competitive rating system would arise.

Originated in Canada, and funded by a sector of the lumber industry, Green Globes is an interactive, self-reporting tool for self assessment of the sustainability of the design. Under the auspices of the Green Building Initiative (GBI) a project's owner can pursue a Green Globe rating

using an online self assessment tool for \$500. This compares to the low end of LEED at about \$2,250.

Like LEED, Green Globes is a graduated system based on possible 1000 points. The owner receives one to four Globes based on the percentage of the total that

is reported. Green Globes points address similar issues to LEED, assessing the project's site impact, water and energy efficiency, use of resources, recycling and indoor environment. Unlike LEED there are currently no municipal, state or federal incentives that use Green Globes as a qualifying standard.

LEED Rating System®	Green Globes™
Introduced in 2000	Released in US in 2005
6,400 members	3,930 members
over 400 LEED-NC certified projects	1 Green Globes project
In use in Canada	In use in Canada
USGBC pursuing ANSI accreditation	GBI accredited as ANSI standards developer
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# MBE/WBE Company Spotlight

## Castcon Stone Inc.

Providing high-quality architectural precast to customers interested in value has been the mission of Castcon Stone since its inception. Manufacturing and shipping those products in a way that is responsible to the environment adds even more value to the industry.

The company was founded in 1954 as an innovative alternative to the stone retaining wall business of Carl Huch Sr. and his son, Carl Jr. Quarrying stone was a highly seasonal and back-breaking business, and using concrete meant minimizing the seasonality and increasing the product line to include stairs and other architectural products.

By the 1990's Carl Huch Jr.'s daughters, Laura Huch-Kerckhoff and Sandra Ussia, were involved in the business and by 1993 the planning was put in place to transfer ownership to the two sisters. When Laura and Sandy acquired the business in 2000 their philosophy of putting customer needs first and selling value was deeply rooted as a third-generation family business. One of the core values of Castcon Stone today is to operate their business in the most environmentally-sensitive way possible. In the precast concrete business that's not easy to do, but Castcon's management looks at every opportunity to reduce their environmental impact. "We can work with the content of the concrete, use carbon-fiber reinforcement or modify the chemistry to reduce the weight of the product," says Laura, "which in turn reduces the fuel needed for shipping. We also try to use a local source for everything we can." Adds Sandy, "You can also operate your facility with as little waste as possible, recycle, and reduce water and energy consumption. All of these things limit your environmental footprint."

Castcon made a significant commitment to that sustainable philosophy by building its new 17,000 square foot facility to LEED standards. The building, designed by Perkins Eastman, is located in the Victory Road Industrial Park in Southeastern Butler County, and is one of the earliest LEED-certified buildings in the region. Opened in March 2003, Castcon's plant received especially high marks for wise water use and energy conservation. While triple the size of their old plant, Castcon's new facility uses the same amount of energy as their Dutilh Road building consumed.

While the new plant was a source of pride it took some getting used to. The increased capacity wasn't being utilized properly and orders were being turned away, which was the main problem the bigger plant was to solve. "We realized immediately that we had taken for granted how low our overhead was in Cranberry," says Laura. "To get the benefit of the new building...we had to re-think everything we did. In many ways it was like we stopped one company and started a new one here."

It took more than a year to re-engineer processes and people to take advantage of the expanded facilities so that Castcon could grow as planned. Sandy says, "We are extremely

grateful to our suppliers and partners for their patience and their help in figuring out solutions." In February 2005 Castcon created the Chief Operating Officer position and hired Jim Clark to oversee operations, which allows the two owners to ensure that their values are translated from their customers to the manufacturing floor. "We practice value-based marketing. If we show our customers how to make the right choices from the beginning we end up with happy customers," says Laura. "It means we have to find out what our customers value in us and our competitors and give it back to them. One of those values we try to share with our customers is sustainability."

## Company Profile

### Castcon Stone Inc.

Laura Huch-Kerckhoff, President  
Sandra Ussia, Vice-President  
2900 South Noah Drive  
Victory Road Business Park  
Saxonburg, PA 16056

Phone 724.352.2200 • Fax 724.352.2290  
Email: s.palone@castconstone.com

**Number employees: 38**  
**Annual Sales: \$4-5 million**

## Current Projects:

151 Firstside Condominiums, Pittsburgh PA, Zambrano Corp.  
New Jersey Devils Arena, Newark NJ, Bovis Lend Lease  
U.S. Census Bureau, Washington DC, Skanska Corp.



Laura Huch-Kerckhoff (l) and Sandy Ussia (r) at their Clinton plant.



# Trend to Watch



## Building Integration Moves Forward

By Jeff Burd  
and Mike Dorefler

Smart buildings have been around for more than two decades now. In the mid-1980's advances in the technology of computers, getting smaller and more powerful, made smart buildings seem very accessible. But, twenty years later intelligent buildings, as they were initially conceived, are not commonplace. Recent changes in the technology of distributing low voltage systems and in communications between devices may finally be opening up the market.

Building integration as a category probably needs more definition than the references to smart buildings. The complete integration of building systems requires equipment that is able to monitor and communicate with a central control, and with other devices. Total building integration means that the building will be responsive to the owner's end-use requirements within the total environment the building exists. HVAC and lighting systems, for instance, will need to be controlled for the user loads, and also for the external environment. For example, lighting is needed in the absence of daylight at a specific level, but only if occupants in the building are there to use it.

Every building has comfort, lighting, security and communications needs that are specific to the needs of the occupants. Those needs have been able to be translated to building systems through both digital and analog controls for decades. What was to be revolutionary about intelligent buildings was the ability to control environments remotely, flexibly and selectively, and to get information back from the building systems about how the building was performing.

What prevented the saturation of the market by such buildings, more than anything else, was good old American ingenuity. During this same time period, unfortunately, owners and developers have become

very savvy and willing to ask designers and contractors to do more for less. This environment of heightened competition motivated manufacturers to push their internal resources to create better equipment, and also to control how the equipment related to other systems so that the manufacturer didn't lose a competitive advantage. Some of that American ingenuity was used to keep Controller A from talking to Device B, unless both were made by the same company.

As sustainable design advanced and building owners began to understand the advantages of having multiple devices communicating and running on the same backbone, the demand for open protocols increased. While the market is still not wide open, it is changing. "It's starting to happen more often," says Alan Traugott of CJL Engineering, "It's not too different from the PC world with MAC and PC's exchanging information now. The definitions are out there now to be used by everyone."

LEED-certified buildings require significant reductions in energy consumption, which in turn have resulted in HVAC designs that utilize technology for monitoring and controlling the building's comfort in relation to the external environment. As one of the organizations which set the baseline for responsible energy design the American Society of Heating Refrigeration & Air-conditioning Engineers (ASHRAE) has set standards for LEED designs, and has created an open protocol architecture, called BACnet, which promotes maximizing technologies for energy reduction. Those same technologies can also allow a building owner to use the same CAT-5 infrastructure to array his lighting controls, security systems, access controls, HVAC and communications, all talking to the same server. Such integration provides great operating control.

James White, partner at LLI Engineering, also sees open protocol architecture creating incentives for manufacturers to eliminate their proprietary engineering. "It's how a \$60 thermostat can become a \$10 thermostat." Such economies can be multiplied when one company makes a variety of these controls and the equipment. "That's one of the

reasons Johnson Controls bought York," says White, "and Trane is also considered one of the 'Big 4' controls manufacturers now."

This kind of consolidation isn't complete, and the architecture isn't omnipresent yet. "You won't get full functionality in a building because we're not to the 'plug and play' world yet," says Traugott. "You can't just pop out Siemens equipment and plug in Honeywell." More pressure to get truly open is coming as controls manufacturers develop IP-based systems for Internet and wireless monitoring.

What would complete integration look like? Imagine an employee needing to get a little work done in a secure building on Saturday afternoon. The device that detects and allows access to the employee would activate the lighting, ventilation and comfort in his office area. The restroom in his area would be accessible, but his co-workers office would not. If the Saturday worker entered the co-worker's office the security camera would record his actions. If the employee entered a sensitive area the action could even trigger an alarm for internal security or police. When the police patrol arrived the officers could be sent a floor plan on their Blackberry, with the exact location of the employee shown. If the security issue was serious enough the police could lock the employee in his location until security arrived. It's enough to make you think twice about peeking in the boss's file cabinet next weekend!

One of the ways green building is helping to drive more building integration is in the use of sub-controls to monitor system components to maximize energy performance. Truly integrated buildings provide feedback on problems that wouldn't have been checked before. Using LEED Measurement and Verification methodology requires such information from the sub-components. "You could have a roof-top unit with an outdoor damper stuck," notes White, "but you wouldn't check it if the building was comfortable."

Owners are also paying more for LEED Measurement and Verification to ensure the best building performance. MEDRAD's new office in TECH 21 Business Park is using sub-meters to measure individual equipment pieces within systems. MEDRAD figures that the efficiency gained by keeping all components in a system at peak performance will pay back any extra costs associated with M & V.



Smart buildings will still come up short on total integration of all systems as long as fire safety codes require dedicated fire alarm infrastructure. The improvements in infrastructure, information technology, communications and open protocol architecture have made building integration a potentially cost-saving measure, rather than a value-added extra. Add to that the role that integration plays in designing green and the incentives to build an integrated building may finally make those 1980's science fiction claims about smart buildings a 21st century reality. **BG**



# Best Practice



*This is the second of a two-part series on commissioning focusing on the benefits and requirements of commissioning in a green building.*

## COMMISSIONING FOR SUSTAINABILITY

Rebecca T. Ellis, PE, LEED AP, CCP, CxA

Many people in the construction industry equate sustainable design with the United States Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED®) certification program. However, the concept of sustainable design existed prior to the USGBC, and the LEED program was developed to encourage and facilitate its application in the mainstream design and construction market.

Similarly, building systems commissioning was an established process before it became a prerequisite for certifying a project under the LEED-NC (New Construction) program. The LEED program is a compilation of best practices with respect to energy conservation and good environmental stewardship, and a project can earn points for implementing specific best practices. The fact that commissioning is a prerequisite to earning any points under the LEED system illustrates how important the USGBC considered commissioning to be for achieving the sustainable design and construction goals of their program.

Returning to the BreakingGround's September/October edition article on commissioning, the simple definition of commissioning is:

*A systematic process of ensuring that building systems are designed, installed, integrated, and tested to perform according to the design intent and the building Owner's operational needs.*

This definition applies to any and all building systems that are expected to perform to a certain measurable standard. This includes sustainable design-driven features such as, but not limited to, the following:

- Heating, ventilating and air conditioning (HVAC) energy conservation strategies
- Indoor environmental quality
- Domestic hot water energy conservation strategies
- Water conservation strategies (domestic, process, irrigation, etc.)
- Lighting controls and daylighting
- Renewable energy systems (photovoltaics, wind power, geothermal, etc.)
- Wet-lands development and/or maintenance
- Green roofs
- Permeable parking surfaces
- Measurement and verification systems

As with any commissioned building system, the commissioning of sustainable design features starts with the definition and documentation of the expected performance (acceptance criteria) for each system. This is especially important for new and cutting edge technologies for which there is little or no history to determine "industry standard" performance. If the project team is going to put in extra effort and, potentially, expense to incorporate sustainable design into a project, the development of



an Owner's Program of Requirements is a must. The pre-design discipline of understanding each system's capabilities and the potential inter-relationships between different sustainable strategies can uncover critical issues at the conceptual design phase instead of during construction, system startup, or early occupancy.

In the LEED program, the following are the minimum acceptable commissioning activities that need to be performed in order to be considered for certification at any level.

- Designate an individual to serve a Commissioning Authority.
- Develop and implement a Commissioning Plan.
- Document the Owner's Program of Requirements (OPR) and the design team's Basis of Design (BOD)<sup>1</sup>.
- Include a commissioning specification in the construction documents.
- Verify installation and performance of the commissioned systems.
- Prepare a Commissioning Report.

Ideally, the Commissioning Authority will be a qualified employee of the Owner or a third party professional. LEED, however, recognizes that not all projects have the resources to include such a formal independent commissioning approach. For projects smaller than 50,000 square feet, LEED allows the Commissioning Authority to be a member of the design and construction team, as long as she or he has the requisite credentials and experience.



The LEED certification program offers a single point (out of a total of 69 points available for incorporating environmentally-sound best practices) for what they term Enhanced Commissioning. The Enhanced Commissioning process includes the following activities in addition to the prerequisite activities listed above:

- Commissioning Authority shall formally review the OPR, BOD, and the construction documents no later than mid-way through the development of construction drawings and specifications by the design team.
- Commissioning Authority shall backcheck the OPR, BOD, and the construction documents later in the design phase.
- Commissioning Authority shall review equipment and system shop drawings and submittals associated with the commissioned systems during construction.
- Develop a systems operations manual to supplement the contractors' standard equipment operations and maintenance manuals.
- Verify that training of operations personnel and building occupants is completed per project requirements.
- Commissioning Authority shall facilitate a review of building operation with the building owner, operators, and occupants 10 months after substantial completion.

*continued on page 43*

<sup>1</sup>The Basis of Design is the design team's narrative description of how they propose to meet the system performance requirements defined in the OPR. For example, what equipment, configurations, and control sequences do they intend to incorporate into the design documents?

# AWARDS & CONTRACTS

## What's Going On Around Town

**Landau Building Company** is the general contractor for **Trilogy Partners LLC** for the construction of the **Trilogy Office Building** located at the corner of Crider Road and Route 228 in Adams Township. This 32,000 square foot building will house medical offices. The contract amount was \$4,089,000. **Paul Slowik & Associates** is the architect.

Landau was also awarded a \$ 1.5 million contract for the addition and renovations to E. A. Fischione Instruments in Export, PA. **Paul Slowik & Associates** is the architect. UPMC Shadyside/Presbyterian has contracted Landau to perform renovations for the PACU Expansion located at UPMC Shadyside. Landau is also working on several projects in West Virginia: the Engineering Science Building Addition at Fairmont State University with **The Design Alliance** as architect; Hatfield's Restaurant renovation at West Virginia University with **Alpha Associates**; and a \$ 1 million contract to perform renovation work on the Same Day Surgery Department at Weirton Medical Center. **Paul Slowik & Associates** is the architect. Landau has recently completed a major plant addition for the F.S. Elliott Company, LLC, located in Export, PA, and has also completed several renovations to the Allegheny Country Club located in Sewickley, PA.

**Burchick Construction** was recently awarded by the Department of Veterans Affairs Phase I of the National Cemetery of the Alleghenies. Development of the Cemetery will include 15,500 burial plots, administration facility, public information building, three

committal shelters and columbarium niches. This \$15 million project includes extensive earth moving and landscaping that will provide the national shrine for the veterans that have served our country.

**P. J. Dick** is providing Construction management at risk services for a new \$3.6 million, 13,580 square foot facility for the Gailliot Center for Newman Studies. The project includes a library, chapel and four-apartment residence hall. The masonry and precast plank structure features a clock tower, extensive precast ornamental pieces and millwork. The project architect is **David J. Vater, R.A., Inc.** **P. J. Dick** is providing Construction Management at Risk services for Carnegie Mellon University's new \$64 million Gates Center for Computer Science. The two-structure, 209,000 square foot facility will sit on a 5.6-acre site on the West Campus and will include 318 offices as well as labs, computer clusters, lecture halls, classrooms, and a 250-seat auditorium. University officials will seek Gold LEED certification from the U.S. Green Building Council for the new facility. The project architect is **Mack Scogin Merrill Elam** of Atlanta, along with **EDGE Studio** as local affiliate.

**P. J. Dick** will be providing general construction services for tenant fit-out of the Quantum II office building in the SouthSide Works of Pittsburgh. American Eagle Outfitters purchased the building in October 2005 for its headquarters offices and recently hired **PJD** for the \$8.2 million fit-out. **P. J. Dick's** Small Projects Group was recently awarded a project to

renovate the Mellon Bank Hangar No. 6 at Pittsburgh International Airport. The \$1 million project will begin in October 2006 and is scheduled for completion in January 2007. **H. F. Lenz Company** is the project engineer.

**Mascaro Construction Company** is the general contractor responsible for constructing \$90 million worth of new construction at the campus of Marshall University in Huntington, West Virginia. The projects include 1,000 beds of student housing, 130,000 square foot student activity center, and a new baseball and softball field. Mascaro Construction recently completed the \$40 million Robert C. Byrd Biotechnology Science Center at the campus. Mascaro was the low bidder on \$60 million of prison work for the North Branch Correctional Institution in Cumberland, Maryland. The work will complete the last two phases of construction for this 1,024-cell, maximum security facility. Phase 5a (\$35 million) consists of the 256-cell Housing Unit 3 and support services. Phase 5b (\$25 million) is for Housing Unit 4, another 256-cell unit and support services. Mascaro is the design-build contractor for the Joint Medical Logistics Center in Frederick, Maryland. The \$26.4 million, 130,000-square-foot project is under contract with the US Army Corps of Engineers, Baltimore District. **Baker and Associates** is providing A/E services. Mascaro is the construction manager at risk for MEDRADs Sterile Disposables Manufacturing Expansion project. The 120,000-square-foot manufacturing facility includes a 20,000-square-foot clean room and 100,000 square feet for

manufacturing, warehousing, sterilization, laboratories and office space. The new facility will be constructed at the Victory Business Park in Clinton Township, Butler County. The building is being designed by CRB.

The PA Department of General Services awarded Mascaro a \$78,950,000 contract for the General Construction of the \$107 million Pennsylvania Judicial Center in Harrisburg.

**Carl Walker Construction** is completing a 427-car parking garage for the Cork Factory Lofts. The \$4.2 million project includes 126,000 sq. ft. of parking space on levels two and three, with 60,000 sq. ft. available on ground level for retail/commercial use. Construction began in October on a 165-car parking structure for Penn State University's Behrend College in Erie. The \$3.9 million project consists of a 52,000 square foot two level parking structure dug into a hillside. The precast concrete structure with brick and glass exterior was designed by **Weber Murphy Fox Architects** of Erie.



*PSU-Behrend Parking Structure rendering by Weber Murphy Fox Architects.*

**Uhl Construction**, of Hampton, was awarded a \$7.1 million General Trades contract for addition and alterations to Moniteau Junior/Senior High School in West Sunbury. The project is a mix of approximately 30,000 square feet of new construction and 120,000 square feet of renovations. The architect is Roth Marz Partnership in Erie, PA.

**Rycon Construction** was awarded the General contract for the \$4.3 million New Clack Laboratory facility in Lawrenceville. The 10,000 square foot building,

designed by IKM Inc., will be operated by the Allegheny County Dept. of Health.

Work is underway on 17,000 square feet of new construction at Hillcrest Academy in Bethel Park. **TEDCO Construction** is the contractor on the \$2 million project, designed by **Rios Williams Architects**. TEDCO has also started construction on the \$18 million Medical Student Housing complex for the University of Pittsburgh on Darragh Street. The project, designed by **Renaissance 3 Architects**, will house students beginning in Fall 2007.

Lanxess Corp. selected **John Deklewa & Sons** to renovate lab space at RIDC West. The \$1.6 million project was designed by Loftus Engineers.

**F. J. Busse Co.** recently completed renovations for the Sacred Heart School. The project involved 5,000 square feet of interior renovations and asbestos abatement, and was completed in three weeks. The architect was **Dave Brenenborg of Brenenborg Brown**. Busse is also under construction on a \$1 million project at the Meadowcroft Rockshelter and Museum of Rural Life in Avella, Washington County, for the John Heinz Regional History Center. **Pfaffmann and Associates** is the architect. Construction is underway for the 8,000 square foot expansion for Alpern Rosenthal in the Heinz 57 Center.

**Dick Corporation's** Pacific operation was awarded a \$200 million contract in partnership with Dallas-based Flour Corp. for emergency construction services by the U. S. Navy. Dick Pacific-Flour Corp.'s agreement also allows for up to four one-year options worth \$200 million per year. If exercised the full contract has the potential value of \$500 million for Dick Pacific.

**Massaro Corporation** has been awarded design/build contracts for construction of a 30,000 sq. ft., \$5,000,000 facility for AvPorts Atlantic Aviation, and a \$3,400,000 renovation of the Propel Charter School of

McKeesport. **Tasso Katselas Associates** is architect for both. Massaro has also been selected to do \$1,000,000 of mechanical and electrical system upgrades at Shadyside Presbyterian Church, and a 25,000 sq. ft., \$6.8 million addition at Oakland Catholic High School. **Celli Flynn Brennan** is the architect.



*AvPorts Atlantic Aviation groundbreaking.*

Massaro is under construction on Indiana University of Pennsylvania Main Campus Dormitories, a \$35,399,855 project involving 259,380 sq. ft. of new construction designed by **WTW Architects**. Massaro is working on a 2,400 sq. ft. renovation at Schneider Downs Co., with **Hayes Design Group**, and a new 4,200 sq. ft. branch for Fifth Third Bank in Bridgeville. The \$946,000 project was designed by **Weber Architecture**. UPMC has awarded Massaro two separate projects, a \$1.6 million renovation at the Falk Clinic and a \$1.9 million renovation at Western Psychiatric Institute and Clinic. Both projects involve 10,400 sq. ft. of renovation and were designed by **Image Associates**.

Woodland Hills School District has awarded contracts for a variety of projects as part of a \$10 million renovation program. **Massaro Corp.** is the construction manager. **HHSDR Architects** is the architect. Massaro Corporation has received three awards from the Historic Review Commission of Pittsburgh for its contributions to preserve the integrity and history of Pittsburgh. The Historic Review Commission of Pittsburgh presented awards for: Little Sisters of the Poor Chapel, **Perfido Weiskopf Architects**; Central Catholic High School Auditorium, **Desmone & Associates Architects**, and The Union Project, **Eversmeyer Design Associates**.



# THE INDUSTRY in the COMMUNITY

## "Drive You Wild" Benefits Pittsburgh Zoo

Zambrano Corp. hosted the Third Drive You Wild golf outing for the Pittsburgh Zoo at Treesdale Country Club on August 28. Although overcast skies threatened throughout the day 100 golfers and friends of the Zoo attended.



The Pittsburgh Zoo's Barbara Baker (r) flanks the Ferry Electric foursome and one of the Zoo's reptilian guests.



Baker and Zambrano's Brad Smith (r) with more adventurous golfers.

## BreakingGround Kickoff

On August 22 a party to launch the inaugural edition of BreakingGround was held at the Monte Cristo Club in PNC Park.



(L-to-R) Builders Guild Executive Director Jason Fincke, Lou Gilberti of Greater PA Carpenters, MBA Executive Director Jack Ramage, Steve Massaro of Massaro Corp.



Mike Mascaro, Chair of the MBA Marketing Committee with BreakingGround publisher Jeff Burd of Tall Timber Group.



(L-to-R) Ed Neilson, Special Assistant to Secretary, PA Department of General Services enjoys the evening at the Monte Cristo Club with Tim Chesleigh, Carpenter's Council Representative.

## State Representatives Reach Out

On August 25, 2006, former Congressman Pat Toomey hosted an evening with PA House of Representatives District 42 Republican Nominee Mark Harris.



(L-to-R) Joseph Burchick of Burchick Construction Company; Mark Harris, Republican nominee for State Representative of District 42; and Chris Burns of TEDCO Construction Corporation.

PA Senator Jay Costa hosted the annual Costa Golf Classic at Alcoma Golf Club in Penn Hills on August 28



(L-to-R) Jonathan Fasson and Dennis Troy of GSP Consulting; Pennsylvania State Senator Jay Costa; and Jon O'Brien of the MBA.

## Carpenters Celebrate Apprentice Graduation

The Greater PA Regional Council of Carpenters' 56th Annual Apprentice Graduation Ceremony was held on September 22, 2006, at Heinz Field. The evening was emceed by Ray Vogel, Carpenters Training Director, and Howard Pfeifer, Chairman of the Carpenters' Joint Apprentice & Training Committee. Over 600 attendees congregated to celebrate the graduation of over 150 apprentices.



Mike Veon, State Representative District 14; Dan Onorato, Chief Executive of Allegheny County; and Ray Vogel, Training Director for the Greater PA Council of Carpenters.



(L-to-R) Father Dan Valentine; Jack Brooks, Executive Secretary-Treasurer for the Greater PA Regional Council of Carpenters; Bill Waterkotte, Assistant Executive Secretary-Treasurer for the Greater PA Regional Council of Carpenters; Mike Veon, State Representative District 14; John Mascaro, Jr., Vice President for Mascaro Construction Co.

**NOTE:** In the September/October *News From the Street* section, lead architect on The Encore on Seventh, HKS & Associates of Dallas, was omitted from the article on Downtown high-rises.



# FACES & NEW PLACES

**Dick Corp.** announces the appointment of **David Y. Etchart** to Senior Vice President of Construction.

**The Builder's Guild of Western Pennsylvania**, which represents more than 33,000 highly skilled local union craftsmen and union contractors, has appointed **Jason A. Fincke** as its new executive director. Mr. Fincke replaces John Turyan, former executive from H. J. Heinz, who is retiring after serving as executive director of the Builder's Guild since 1999. A Pittsburgh native, Mr. Fincke is a graduate of Shaler Area High School and Duquesne University, where he earned a Bachelor's Degree in Journalism in 1978. For the past 28 years, he has worked in public service with the Port Authority of Allegheny County, including 15 years as a member of the Authority's senior staff, most recently as its chief of staff.

President of the **Master Builders' Association (MBA)** **Joseph Burchick** has been appointed to the **Pennsylvania Joint Task Force on School Cost Reduction**. This bipartisan group of thirteen professionals with diverse backgrounds and expertise will be required to look at the impact state mandates have on school districts. Mr. Burchick was appointed by the Speaker of the House of Representatives John Perzel, a legislator from Philadelphia. Mr. Burchick is president of **Burchick Construction Company**, a general contractor headquartered in Pittsburgh's North Hills.

**Burchick Construction** is pleased to welcome **Wes Cypher** as Senior Project Estimator. Wes' background includes seven years in the construction industry with additional background in the electric utility and HVAC industries.

**Marsa Inc.** is proud to announce the completion of their new building. The new address is 1000 Castleview Road Pittsburgh, PA 15234-2299. Marsa's phone and fax number will remain the same. The phone number is (412) 341-3400, the FAX is (412) 341-1355, or visit them at [www.marsainc.com](http://www.marsainc.com).

**P. J. Dick Inc.** announces that **Kim Wilson** has joined as a Project Estimator working in the main office. Kim has over four year's construction experience and a BS in Civil Engineering and BA in Architectural Studies from the University of Pittsburgh. She is currently pursuing her MS in Civil Engineering, also at Pitt. **Julie Rankin** joins as a Project Estimator in the main office. Julie has a Bachelor of Architectural Engineering degree from Penn State University. She served as an intern with Hensel Phelps Construction Company at the Pentagon project in Washington, DC over the summer of 2005.

**Landau Building Company** is pleased to announce that **Robert Bredel** has joined the company as a Senior Project Manager. Mr. Bredel brings over 25 years experience

in private and public commercial construction. He holds a Bachelor of Science Degree in Civil Engineering from the University of Pittsburgh and is a registered Professional Engineer.

**Adam S. Ennis, Esq.**, has joined **Maiello Brungo & Maiello, LLP**, Attorneys at Law as a Principal. Mr. Ennis will chair Maiello Brungo & Maiello's Litigation Group, which covers a range of matters including commercial, real estate and employment.

Bringing with him sixteen years of business and construction litigation experience, Mr. Ennis is a seasoned trial attorney who represents clients in federal and state proceedings as well as arbitrations and mediations. He will now apply that experience to the service of Maiello Brungo & Maiello's clients.

A graduate of the University of Pittsburgh (B.S., 1987) and the Benjamin N. Cardozo School of Law in New York (J.D., 1990), Mr. Ennis is licensed to practice in both the state of Pennsylvania and New York. His extensive background exemplifies successful handling contract disputes and other commercial litigation in the energy, health care, pharmaceuticals, securities, telecommunications and banking industries, as well as construction disputes and other litigation relating to real estate.

**Massaro Corporation** welcomes **Michael Katz, CPA** as new Chief Financial Officer/Chief Administrative Officer. Mr. Katz joins the Massaro team with more than ten years of experience in the construction industry and over eight years in public accounting. He received his Bachelor of Science in Business Administration with a Major in Accountancy from Miami University in Oxford, Ohio. In his new position, Mr. Katz will be responsible for overseeing accounting, finance, human resources, and information technology.

In addition, Mr. Katz is a Certified Public Accountant, current Board Member of the Construction Financial Management Association (CFMA), Member of the American and Pennsylvania Institute of CPAs (AICPA and PICPA) and is on the Board of Trustees for the Leukemia & Lymphoma Society.

**Alpern Rosenthal** has announced the hiring of 48 new employees in 2006, including 32 additional accountants. The firm now employs 190 people. Within the past year Alpern has moved into the Heinz 57 Center and added another 7,500 square feet, bringing the total expansion of their space to one-third more than in 2005.



# In Memory

Within the past 60 days two men who had had a significant impact on real estate and construction passed away. Don Peters was an industry leader for decades and directed many of the organizations which still benefit the community today. Bob O'Connor led our city, and region, for less than a year, yet his impact on the region's self image played a significant role in the construction boom we're currently experiencing.

## HONORABLE ROBERT E. O'CONNOR JR.

Few people who will ever serve the public will probably ever be as well-identified with his constituents as Mayor Bob O'Connor was. After unsuccessful attempts to be elected mayor in 1997 and 2001, Bob O'Connor was elected to lead his beloved city in November 2005. Sadly, less than one year into a promising term Mayor O'Connor died on September 1 after a battle with the extremely rare T-cell type of the uncommon primary central nervous system lymphoma at the age of 61.



A child of Greenfield, he was born Dec. 9, 1944, to Bob Sr. and Mary Anne Dever O'Connor. His father was a truck mechanic who carried Pacific theater shrapnel in his back and died of a heart ailment in 1978. O'Connor graduated from Taylor Allderdice High School in 1962, married a girl from Squirrel Hill and lived in that neighborhood the rest of his life. After a short stint working in a Jones & Laughlin mill, O'Connor went to work for the Pappan's restaurant chain, rising to Executive Vice President before leaving to serve as City Council representative in 1991.

Bob O'Connor may have seemed an unlikely friend of development after campaigning in 2001 as a vocal opponent of public financing for the stadiums. His concern for the long-term impact on Pittsburgh's finances weren't unfounded, however, and his belief that the public image of the region was at the root of lagging development was bearing fruit in his first year in office.

Mayor O'Connor is survived by his wife of 42 years, Judy, and three children, Heidi Garth, now of Swissvale and a marketing research manager; Terrence O'Connor, a law school graduate who went on to become a Catholic priest at St. Alphonsus Parish in Pine; and Corey O'Connor, varsity golf coach at Central Catholic High School.

## DONALD CAMERON PETERS

Don Peters passed away Wednesday, August 16, 2006 at Carriage Court Assisted Living in Lancaster, Ohio. Peters was involved in the construction and charitable communities in Pittsburgh for more than 60 years, including nearly two decades after his retirement in 1981.



Don Peters is remembered best professionally as the President of Mellon Stuart Construction from 1951-1981. The largest contractor in the region for decades, Mellon Stuart was the training ground for thousands of construction workers, many still active today. As an indication of Don's professional influence, more than a dozen contracting firms were founded by former Mellon Stuart managers in the decade after his retirement.

Outside of work Peters was Trustee of La Roche College from 1967 and Board Chairman 1983-84; Chairman of Pine Township Supervisors from 1953 to 1980; and Chairman of the Pittsburgh Chamber of Commerce for several years. Don was Chairman of the Construction Industry Advancement Program (CAP) from 1975 to 1993, and a fixture on the Master Builders' Association board. As a Professional Engineer, Don was on the Pennsylvania Registration Board for Professional Engineers from 1962 to 1982, President of PSPE 1953-54, and a lifetime Fellow of ASCE. He was on Passavant Hospital's Board of Directors from 1963 to 1990. He was past President of the Pittsburgh Builders Exchange and board member of Liberty Mutual Insurance Co. from 1968 to 2000.

Don is survived by his children Susan Ingram, David Peters, Bruce Peters, Douglas Peters and Catherine Peters along with grandchildren: Brett Ingram, Scott Ingram, Brian Peters, Aimee Erhardt, Beth McNeish, Katie Peters, Sean Peters and Nathan Peters; great grandchildren: John, Tabatha, Colin, Gavin and Paige. He is also survived by a brother, Robert Peters of Fox Chapel and sister, Dorothy Kleiber, of Fond du Lac, Wis. Don was preceded in death by his wife of 64 years, Twila B. Peters.

# MBA Membership

## **MBA MEMBERSHIP**

The Master Builders' Association (MBA) is a trade organization representing Western Pennsylvania's leading commercial, institutional and industrial contractors. MBA contractors invest in a skilled workforce, implementing award-winning safety programs and offer the best in management and stability.

The MBA is a chapter of the Associated General Contractors of America, the nation's largest and oldest construction trade association. The MBA is committed to improving the construction trade association through education, promoting technological advancements and advocating building the highest quality projects for owners. To learn more go to [www.mbawpa.org](http://www.mbawpa.org).

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**Clifford R. Rowe, Jr.**  
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**Thomas A. Landau, Treasurer**  
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Sinclair, Kelly, Jackson, Reinhart & Hayden, LLC  
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UPMC Work Partners  
VN Services  
West Elizabeth Lumber Co.  
Westfield Insurance  
Willis of PA Inc.  
Zurich NA Construction



*continued from page 35*

The Enhanced Commissioning point prohibits the Commissioning Authority from being a member of the design and construction team and imposes stricter requirements on who is qualified to serve as the Commissioning Authority. In addition, Enhanced Commissioning typically needs to start no later than the Design Development phase of a project in order to meet the design review requirements.

If you compare the LEED requirements with the bulleted list of commissioning process elements in the September/October article, you will see that LEED has selected a subset of elements as the critical best practices for commissioning success. This does not prevent the owner of a sustainably-designed and/or LEED-registered building from incorporating more than the LEED minimum commissioning activities, if they deem those activities to have value for their project and/or on-going operations.

LEED requires that only the following energy-related building systems be commissioned in order to meet

the prerequisite and/or Enhanced Commissioning requirements:

- HVAC systems and associated controls
- Lighting and daylighting controls
- Domestic hot water systems
- Renewable energy systems

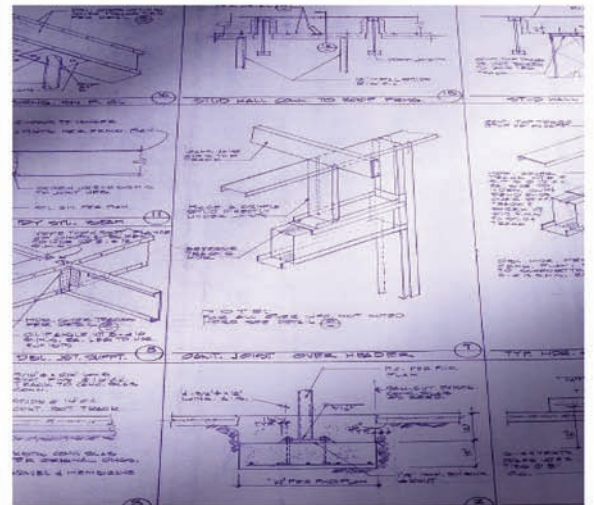
It is likely that building owners committed to commissioning their projects will want to commission their mission-critical systems (e.g., backup power, redundant heating, space pressurization, humidity control, life safety, etc.) in addition to the energy-related systems required by LEED. Therefore, the Commissioning Authority should be prepared to assist the owner in defining performance parameters and commissioning processes for the systems not covered by LEED. **BC**

Rebecca T. Ellis is President of Questions & Solutions Engineering, Inc. of Chaska, MN.

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# Closing Out

## Building a Green Zoo is Hard But Worth Doing



The Pittsburgh Zoo & PPG Aquarium is committed to protecting and enhancing natural habitat while educating the public about conservation and preservation of the environment. Incorporating sustainable design into their construction projects is a natural and obvious way for the Zoo to demonstrate that commitment. The new Animal Health Center to be constructed at the Pittsburgh Zoo will incorporate many common-sense strategies, as well as a few unusual features, towards achieving a LEED rating.

A top priority for the building design is the health and well-being of all building occupants: the humans working here, the children and adults visiting the exhibits, and the animals receiving medical care here. The regularly occupied offices and staff areas, animal holding pens, and exhibit and education areas are located at the perimeter of the building so as to have access to daylight, views, and fresh air. Interior finishes are being selected based on high-durability and low toxicity. Materials must be adequately durable to withstand the scratches, bumps, and messes that accompany an animal occupancy. However, highly durable materials do not need to be replaced or repaired as often, and therefore their life-cycle impact on the environment is minimized as well. Natural and non-toxic materials do not release harmful chemicals into the space, improving air quality for human occupants and for sick animals being nursed back to health.

The Animal Health Center building will reduce energy and water usage over a typical building by using a partial earth-berm layout, careful building envelope and mechanical system design, and low-flow water fixtures. Animal holding areas typically require a high number of air changes, meaning that energy used to condition that air is often wasted when it is exhausted. The proposed system will recover the heat from exhausted air, without cross-contamination, and use it to pre-condition incoming air, reducing energy usage significantly.

One exciting feature of the building is a vegetated roof that will partially cover the main roof. The "green roof" acts as insulation, helping to keep the building cooler in summer and warmer in winter, improves the rate and quality of stormwater runoff, and provides an attractive view from the hillside above the building.

Successfully incorporating sustainable design requires thoughtful commitment by all members of the design and construction team. Pursuing a LEED rating is an added layer to an already complicated building process, but it is a goal to which the Zoo feels strongly dedicated because of its natural fit into its broader mission.

*By Frank Cartieri*

*Frank Cartieri is Director of Operations for the Pittsburgh Zoo and PPG Aquarium. The Zoo is in the midst of investing tens of millions in expanded and improved facilities. Even though animal facilities face significant hurdles in sustainable construction because of their unique needs for ventilation, water use and waste, Pittsburgh Zoo and PPG Aquarium have committed the time and resources to make building green part of their mission.*



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