Breaking Ground

THE MAGAZINE OF THE MASTER BUILDERS' ASSOCIATION OF WESTERN PENNSYLVANIA

SEPTEMBER/OCTOBER 2007

NEW TECHNOLOGY NEW OPPORTUNITIES

The Grant Street Transportation Center Is Built With 3-D Modeling

Update on Technology and Construction

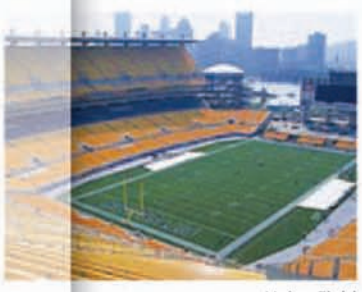
Building Information Modeling Inspires New Contracts

Regional Housing Turns Up While the National Market Slides

Pittsburgh Rated Least Risky Market, Third Best Future City in North America

two Pittsburgh industry leaders *united as one.*

The Petersen Events Center



Heinz Field

Equitable Resources Headquarters

Rand Corporation Building

Seagate Technology

UPMC Children's Hospital Campus

QUALITY STABILITY COMMITMENT DIVERSITY EXPERIENCE

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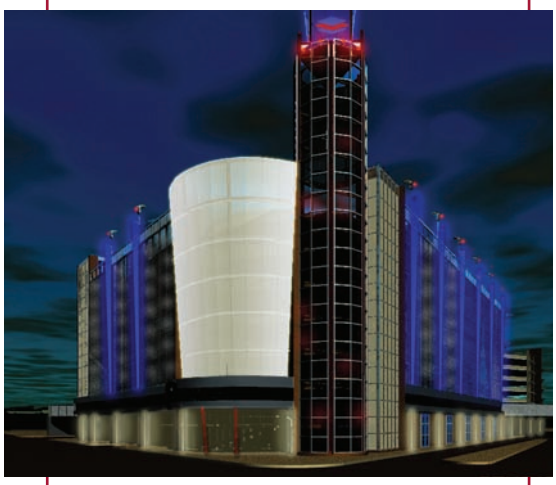


Features & Departments

Publisher's Note

It was a year ago that the idea of a regional magazine for construction and real estate became reality, as we published *BreakingGround's* inaugural edition after Labor Day 2006. At the time, the Master Builders' Association and I felt that there was a need for this industry to have an information source that provided real data on the market's activity regularly, and a forum to present the good things that were happening in the region.

The past year has proven that the industry wanted just a resource. Your response to the information presented in each edition has been gratifying, and the readership has grown by 100% during that year.

I think it's been a happy coincidence that the commercial construction market has been very strong over the past two years, and that 2006 and 2007 have been years where the fruits of the redevelopment work of the past two decades have become obvious. Even the normally gloomy local press has been unable to dampen the spirits of the business community.

…"it's been a happy coincidence that the commercial construction market has been very strong over the past two years, and that 2006 and 2007 have been years where the fruits of the redevelopment work of the past two decades have become obvious…"

As we start the second year of publishing, the focus of this edition will be on technology. Writing that focus on the editorial calendar a year ago seemed pretty simple and obvious. The topic, however, is so eponymous that I found it was harder to break much new ground (no pun), especially since we have focused regularly on new technology. What I tried to highlight was how intertwined the industry is with new technology, both as a creator of new construction and as a cornerstone of the industry's operations.

The story of our region's transformation from industrial to information-based economy is beginning to get trite, but it is important to remember that the principal driver of construction in Pittsburgh anymore is technology. Much of the new construction at our universities, public or private, is in response to demand for technology education or research transfer. Most of the healthcare construction, especially the renovation of existing clinical space, results from the need to house new or replacement medical technology for surgery, diagnostics or therapy. And the most obvious driver is the need for space that comes from technology businesses that start and grow (see Medrad, Cellomics, or Vivisimo).

Construction and design is also an industry that is a voracious consumer of new technology. It's easy to forget that something as old school as a lumbering backhoe is, in fact, an incredible piece of productivity technology, which replaced the need for dozens of human earthmovers. As fees and margins have been squeezed in response to competition, the use of new technology to get an edge or reduce costs has multiplied in our industry.

I hope you'll enjoy the technology edition of *BreakingGround*, as I hope you've enjoyed the six before it. I also hope you'll be sure to contact me if there's ever anything you think the magazine should be doing better. We intend *BreakingGround* to be the voice of the industry in Western PA and are excited to see it becoming a 'must read' for the market (and feel free to keep that in mind when preparing your advertising budget!).

Thanks again for a great start!

Sincerely,

Jeff Burd

News From The Street

More Good News About the Metropolitan Area

Metropolitan Pittsburgh has been rated the least risky market for housing for the second straight year by PMI Mortgage Insurance Co., a subsidiary of the PMI Group Inc., a Walnut Creek, California-based risk management firm. The price of a house in the area has only a 6.4 percent chance of declining, according to the survey of the nation's 50 largest metropolitan areas.

In contrast, Riverside, Calif., Phoenix, Las Vegas and West Palm Beach, Fla., rank highest on the index with a 60 percent or higher chance that home prices will be lower in two years.

TOP NORTH AMERICAN CITIES OF THE FUTURE 2007

Rank	City
1	Chicago
2	Toronto
3	**PITTSBURGH**
4	Atlanta
5	Guadalajara
6	Baltimore
7	Montreal
8	Mexico City
9	Boston
10	Miami

Source: Financial Times' fDi Magazine April/May 2007 Issue

The Financial Times fDi Magazine April/May 2007 issue ranking of the top major cities of the future ranked Pittsburgh third overall. The Financial Times fDi, a magazine about foreign direct investment, asked a panel of judges drawn from international location consultants, corporate executives and other experts, to rank cities in North America based on seven economic categories. Pittsburgh ranked in the Top 10 of all seven of the selection categories listed below:

- Best Economic Potential
- Best Infrastructure
- Best Development & Investment
- Promotion
- Most Cost Effective
- Best Human Resources
- Best Quality of Life
- Most Business Friendly

PMI Mortgage 2007 Summer Market RISK Index

Rank	City	Risk %
1	Riverside-San Bernadino CA	65.2%
2	Phoenix-Scottdale AZ	64.6%
3	Las Vegas NV	61.4%
4	West Palm-Boca Raton FL	60.7%
5	Los Angeles-Long Beach CA	58.6%
6	Santa Ana-Anaheim CA	57.7%
7	Oakland CA	57.2%
8	Orlando FL	56.3%
9	Sacramento CA	56.0%
10	San Diego CA	55.5%
50	**Pittsburgh PA**	**6.4%**

MBA Risk Management Committee Creates Online Learning Opportunity

The MBA Risk Management Committee has developed an online safety training section linked from the MBA website (www.mbawpa.org). By visiting the MBA website, area construction professionals will be able to take an OSHA approved 10 or 30 hour construction outreach course. The Risk Management Committee does not intend for this to replace traditional classroom training courses, but instead act as an additional option to meet our industry's unique demands. "The new online training courses will provide MBA members with another convenient way to train their workforce with the best materials available," said Joseph Franceschini, Risk Management Committee Chairman.

Developed in partnership with 360 Training, the online courses will be offered at a significant discount to MBA members. While other construction associations opt to keep the revenue sharing offered by 360 Training, MBA will pass on the savings to the membership in the form of a discount. OSHA courses will be offered at a 30% discount for members, while all other courses will be offered at a 40% discount. MBA members have begun using this cost and time effective training tool.

"The Committee's goal is to provide MBA members with an abundance of opportunities to obtain timely and effective safety training," said Bob McCall, MBA Director of Safety.

For more information on the MBA's Risk Management Committee and safety training, contact Bob McCall at 412-922-3912 or rmccall@mbawpa.org.

ConsensusDOCS—Construction Associations Create Unified Voice for Contracts

What if owners, general contractors, and subcontractors could all agree on a standard contract that was fair to all parties? For the first time in the industry, 20 leading construction associations, including the Associated General Contractors of America (representing the MBA nationally), are uniting to publish a consensus set of standard contract documents called ConsensusDOCS. With the target launching date of September 28, 2007, the AGC and Construction Owners Association of America (COAA) will be folding its contract documents program into this consensus process.

Currently there are a variety of construction associations that produce standard form construction contracts. However, standard contracts published by one

GREEN BUILDING NEWS

GBA's Flora Elected to Chair U. S. Green Building Council

Rebecca Flora, Executive Director of Pittsburgh's Green Building Alliance, is the Chair-Elect of the U. S. Green Building Council for 2008. Flora has been one of the driving forces in Western PA's sustainable design and construction growth. USGBC's election of Ms. Flora is further recognition of Pittsburgh's leadership role in green building.

USGBC Passes 10,000 Member Mark

The U.S. Green Building Council (USGBC) welcomed its 10,000th member company in July. The achievement marks a turning point in the building design and construction market.

"This achievement is a significant milestone in the growth and development of the green building movement because it demonstrates a broad conviction that our built environment can improve the health of our planet, our economy, and our communities," said Rick Fedrizzi, President, CEO and Founding Chair of the organization.

Today, the green building industry is worth upwards of $12 billion, whereas a decade ago it was negligible. USGBC was founded in 1993 with a vision of transforming the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment. That vision is shared by Council members – who are the driving force behind the Council, and of the green building movement including builders, designers, legislators, policy-makers, educators, manufacturers, developers, activists and scientists.

Green Building Alliance to Award Product Innovation Grants

As part of the Green Building Product Initiative announced in November 2006, the Green Building Alliance (GBA) will begin awarding Product Innovation Grants this year for product development projects that will introduce green building products to the marketplace in the next two years. Over 1,800 building product manufacturers operate in Pennsylvania, and the initiative is designed to stimulate further green product innovation that grows jobs in the state.

The grants, which may be as high as $100,000, will be awarded December 1, 2007. Proposals are being taken now, with a submission deadline of September 28. The GBA seeks to award to manufacturers whose innovations meet the following sustainable qualities:

- Material Contents: recycled, rapidly renewable, salvaged, or non-toxic content.
- Processing / Manufacturing of Materials: minimal water and energy use, material use is limited, or production does not produce harmful impacts on the surrounding environment.
- Product Contributes to a Reduction in Impact : higher efficiency (e.g., energy systems and sensors), reduces environmental impact (e.g., renewal energy components) and products that reduce human health impacts (e.g., air exchange systems and cleaning products).
- Life Cycle: material reusability, longevity, and ultimate deconstruction or disposable.

For more information go to http://www.gbapgh.org/grants.asp.

LEED for General Contractors & Construction Managers Technical Workshop

On September 18, 2007, the U.S. Green Building Council will present a workshop geared to design, construction and operations professionals who want to build on their existing knowledge of LEED through in-depth instruction on the integrated design process. Faculty will share insights and lead individual and team exercises on the certification process, including conducting charrettes, estimating costs and preparing documentation. Attendees should have completed a Technical Review workshop or have equivalent knowledge of the LEED Rating System.

The workshop will be held at the DEP Cambria Office at 286 Industrial Road in Ebensburg, PA. Registration is at 8:00 AM, and the program runs from 8:30 until 12:30 PM.

GBA Seeks Green Products for New Offices

The Green Building Alliance will be moving to new, larger space in the historic Riverwalk Corporate Center in the South Side at the end of the year. GBA will occupy 3,855 square feet of space and intends to seek LEED Platinum certification for the renovation of the offices. The project team includes Jendoco Construction, Landmark Design Architects, CJL Engineering, Ferry Electric, Ruthrauff Sauer, and Moshier Studio as LEED advisor.

GBA wants to use the new offices as a showcase of various green products. In August they solicited donations of building products and materials that could serve as a "first stop for green building" in the region.

association are perceived as ultimately favoring that association's membership. There is also a growing industry frustration that heavily modified standard form documents hardly resemble the original text. Sometimes "modifications" are actually longer than the unrecognizable standard form. ConsensusDOCS is the new choice in contract documents, because all the parties were invited to the drafting table and had a full vote in deciding final contract terms. Stephen E. Sandherr, CEO of the Associated General Contractors of America points out, "All parties in a construction project deserve to work under a fair contract—one that they have confidence in because each of their respective associations had a true seat at the drafting table." The ConsensusDOCS drafting process is similar to negotiations for a specific project contract. The drafting mantra was to represent the best interests of the project, rather than a singular party. The contracts employ best practices and fair risk allocation for all of the parties. Consequently, these contracts focus on yielding better project results and fewer disputes.

Drafting ConsensusDOCS involved the following national organizations: National Association of State Facilities Administrators (NASFA), Construction Users Roundtable (CURT), Construction Owners Association of America (COAA), Associated General Contractors of America (AGC), Construction Industry Round Table (CIRT), Lean Construction Institute (LCI), Associated Specialty Contractors, Inc. (ASC), American Subcontractors Association, Inc. (ASA), Associated Builders and Contractors (ABC), Finishing Contractors Association (FCA), Mechanical Contractors Association of America (MCAA), Plumbing-Heating-Cooling Contractors (PHCC), National Electrical Contractors Association (NECA), National Insulation Association (NIA), National Subcontractor Alliance (NSA), National Roofing Contractors Association (NRCA), Painting and Decorating Contractors of America (PDCA), Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), National Association of Surety Bond Producers (NASBP), Surety & Fidelity Association of America (SFAA), and Engineers Joint Contract Documents Committee (EJCDC).

ConsensusDOCS will include more than 70 contracts and forms, and address all project delivery methods. Additionally, project specific information and modifications can easily be entered through the DocuBuilder software program.

These best practice documents address cutting edge issues such as electronic communications, and building information modeling (BIM). Initial publication will also include a transformative agreement called Tri-Party Collaborative Agreement, which will encourage lean construction. In a fashion similar to the ConsensusDOCS process, the Tri-Party Agreement will have three parties sign the same contract and create a core team. This type of agreement has been used more commonly in Australia and is also known as alliancing or relational contracting. The project's core team, which may include key specialty contractors and consultants, will make consensus decisions based upon the best interests of the project.

Look for more information at www.consensusdocs.org prior to the September 28th launch of the documents. For more information contact Brian Perlberg, AGC Senior Counsel for Contract Documents at perlbergb@agc.org or Jessica Salmoiraghi, Director, Construction Law and Contracts at Salmoiraghij@agc.org.

SMPS Announces 2007-2008 Board of Directors

The Pittsburgh chapter of the Society for Marketing Professional Services (SMPS) recently elected their 2007-2008 Board. SMPS' mission is to advocate for, educate, and connect leaders in the building industry. The association has a membership of more than 5,600+ marketing and business development professionals from architectural, engineering, planning, interior design, construction, and specialty-consulting firms located throughout the United States and Canada. SMPS Pittsburgh's officers for the next term are:

President - Rochelle Stachel, HRV Conformance Verification Associates; Immediate Past President - Terry Caywood CPSM, The Sextant Group; Programs Chair/President-Elect - Robin Zoufalik, RPA Associates; Treasurer - Sharon Landau, Landau Building Company; Secretary - Linda Bailey, Dick Corporation; Coordinators Club Co-Chairs - Ann Wagner, Raudenbush and Enrique Bazan, Paul C. Rizzo Associates; Education Chair - Gil Brindley CPSM, Professional Service Industries; Membership Chair - Amy Koniezka, Turner Construction Company; Communications Co-chairs - Breanna Kristian, R3A and Renee DeMichiei Farrow, Pittsburgh Business Times; Sponsorship Chair - Mike Doerfler, Wellington Power Corporation.BG

REGIONAL MARKET UPDATE

In all but two of the last dozen years the summer months have brought a significant slowdown to the pace of contracting in the region. For the uninitiated in the audience, this is not cause for alarm, but rather the logical result of seasonality and the natural ebb and flow of the work for most owners and designers.

Two main seasonal factors play the largest role in producing the lull that invariably settles in June and July. The winter conditions create a natural time for architects and engineers to load up their design work, with less construction administration and a build up to the breaking weather of spring. The end of school year is the second driver, with K-12 and colleges pushing to get projects bid in winter and spring to allow for contractors to be ready when classes finish.

After strong first and second quarter contracting activity, action in June and July slowed considerably in the bid market. Non-residential contracting in June was $203 million, down 53% from May; in July the contracting improved to more than $250 million. While these totals are off from the monthly levels of the spring, it's worth noting that the volume in June-July 2006 was within $5 million of the 2007 total, and those months in 2006 hardly foretold a slowdown.

Looking out into the late third and early fourth quarters there are indicators that the strong non-residential construction market will continue, allowing backlogs to build for architects and contractors. The Bureau of Labor Statistics reported in July that employment for architectural and engineering services had increased again, and anecdotal evidence regionally shows that the majority of design firms would hire now if they could find suitable candidates. Local civil engineers report that the pace of inquiries for land development and testing remains brisk, and regional manufacturers surveyed reported higher orders and plans for increased capital spending into 2008.

Bid activity is beginning to bear out the results of some of this survey data. Contracting is beginning for the $60 million Passavant Hospital Pavilion Addition, and the first Westinghouse Nuclear building in Cranberry Woods, worth approximately $140 million. Respironics announced plans for a new 165,000 square foot, $22 million facility in Upper Burrell Township. The $70 million Butler Memorial Hospital expansion should have a construction manager at risk selected in September, and a $100 million phase of the VA Hospital CARES project should advance in September, pending final funding approval.

Two of the high-profile projects that have been anxiously awaited are moving towards groundbreaking as well.

PITG Gaming/Barden Enterprises appears to have weathered all the regulatory and legal storms in the way of its Majestic Star Casino. While final municipal approvals and neighborhood negotiations are being completed, work on the foundation systems has begun and structural steel has been fabricated. The $400 million, 438,000 square foot casino is still optimistically scheduled for opening in 2008.

> As the national housing market continues to struggle, one of the brighter spots for housing has been Western PA.

At the same time, the Sports and Exhibition Authority (SEA) is taking significant steps towards construction next year on the new Penguins Arena. While the Penguins were making the decision to move the scheduled opening to the Fall of 2010, the SEA is in the process of selecting a construction manager for the project from four finalists, including joint ventures involving local contractors P. J. Dick Inc. and Mascaro Construction. The P. J. Dick/Hunt Construction, and Mascaro/Barton Malow teams are in competition with M. A. Mortenson Co. and Gilbane Building Co. The construction manager should be selected in early Fall.

Another sector that is continuing to boost non-residential construction in the region is retail. Although the driving force behind retail construction, new housing, has lagged significantly over the past two years, several big retail projects have added to the square footage of new space. The Foundry in Washington and the Tanger Outlets in the Meadowlands area, have each put over 300,000 square feet under construction. As the second half of the year winds down two more large projects, the 1 million square foot Simon Mall in Cranberry and the 500,000 square foot Settlers Ridge Center, should be near groundbreaking. While the 'big box' retailers have slowed their contracting in 2007, the drug store chains have heated up. Currently, there are more than a dozen

Walgreens, Rite Aid or CVS stores under construction in metropolitan Pittsburgh.

As the national housing market continues to struggle, one of the brighter spots for housing has been Western PA. First remember that the good news is the smaller degree of decline, rather than housing growth. Unlike the double-digit falloffs experienced elsewhere, housing starts in Pittsburgh were down about 9% year-to-year from the first half of 2006. Housing permits for the past three months in metro Pittsburgh indicate that the bottom of the decline has been reached in this market, with single-family permits up roughly 5% over the same period in 2006. Assuming this trend continues into fall and winter, housing starts should begin a growth cycle again in 2008.

One troubling sign in the market over the past quarter or two is the softening of the 'middle' of the market. Because most of the contractors in the region are relatively small, averaging less than $50 million per year, a steady diet of $1 million to $5 million projects is needed to keep the mainstream market comfortable. With the unusual number of projects over $50 million under construction for the past two years, it has been easier for the few large contractors to stay busy with local work, and it has been a good market for the $50-$100 million contractor to grow larger. Contractors who normally fill their bellies with a few $3-5 million jobs, and a lot of smaller work have had to scramble more to meet their goals in 2007. Contributing to the problem has been a weaker-than-usual publicly funded market, owing mostly to the state's budget problems and the increased construction costs of the past few years.

Heading into the Fall, however, design pipelines remain full, and the signs of progress on most of the large projects remain positive. Public construction is scheduled to see a pickup in bidding from the state and increased activity in the K-12 market. Real estate inquiries in Cranberry have escalated since the Westinghouse announcement. And 'lifestyle' centers are nearing construction in literally all four corners of the metropolitan area.

There seems to be little on the horizon that could derail the non-residential market for the next three to four quarters, and if the regional housing market continues to recover ahead of the national market, Western PA could see an extended construction growth cycle into 2009.BG

NATIONAL MARKET UPDATE

The data for the first half of 2007 shows a real mix of signals for the national construction economy, with the divergence between the cycles for residential and non-residential contracting beginning to reverse course, at least for the short term.

Most of the macroeconomic data shows an economy that is healthy overall. The Bureau of Economic Analysis reported that gross domestic product (GDP) in the second quarter grew at a seasonally adjusted rate of 3.4%, net of inflation. That rate is better than expected, and up significantly from the 0.6% rate of the first quarter. The GDP price index slowed to a 2.7% annual rate. Unemployment remains in the 4.4%-4.6% range. Industrial output rose 1.6% over 2006, and manufacturing capacity utilization rose to 80.3%, compared to the long-term average of 79.8%.

The national construction data for the first six months tells a tale of two markets going in opposite directions. Non-residential contracting was up 8% compared to the first half of 2006, according to McGraw-Hill Construction, and by 18% according to the Census Bureau. Residential construction was down 26% over the same period in 2006, according to McGraw-Hill.

Looking forward, two surveys point to a continuation of the non-residential construction boom. The National Association of Business Economics reported that its second quarter industry survey showed that 29% of its respondents expect to increase capital expenditures during the next 12 months (compared to 8% in April); and, the Bureau of Labor Statistics showed an increase in architectural and engineering services for the 42nd straight month.

On the labor front there were also two pieces of good news, as construction employment and compensation slowed, giving further relief to the rate of increase for construction costs. Total construction employment was down 0.7% compared to July 2006, although most of the decline was due to the 3.4% decline in residential jobs. Total compensation for construction jobs increased 0.9% in the second quarter, compared to 1.2% in the previous quarter.

Activity in the residential market did show the first glimmers that the nearly two-year decline may finally be bottoming out. Residential construction spending increased 4% in June compared with June 2006, according to McGraw-Hill Construction. The Mortgage Banker's Association reported that for the week ending August 3 new mortgage applications rose 8.1% to the highest levels in two months. In a survey that covers approximately 50% of the retail residential loans in the U. S., the purchase index (which gauges the loans for purchase of homes only) rose 7.4%. These results match very closely with the National Association of Realtors survey showing the number of pending home sales had risen in June at the fastest pace since 2004.

On the labor front there were also two pieces of good news, as construction employment and compensation slowed, giving further relief to the rate of increase for construction costs.

Proving that for every silver lining there's a cloud, the Census Department announced in mid-August that building permits for new housing dropped 7% in July. First, it's worth noting that Census uses a significant amount of estimating in their analysis, and retroactive corrections are common, so looking at data one month at a time may not be prudent. As an indicator of the economy, such data should also be viewed cautiously. Reduced permit levels are likely to be an indication that the homebuilders, particularly those high-volume public companies, are not adding to inventories as a remedy to existing market conditions. Such a remedy isn't good news in the short run, but will act to clear out the market prior to the beginning of a new growth cycle. BG

WHAT'S IT COST?

A look at the June producer price index below tells a story that is relatively boring for the first time in several years. Unlike the previous eight or ten quarters, the second quarter of 2007 was a time of little dramatic increase in the major basic materials that are inputs or finished products for construction products. Even better is that the outlook for the balance of the construction year is for more stability and decline in some of the building materials that have been more volatile over the past few years.

One of the two basic materials which rose precipitously during the second quarter was crude petroleum. While the effect of that increase also showed up downstream at the diesel refinery and asphalt plant, by mid-August crude and diesel prices had backed off 8-9% from the June high points.

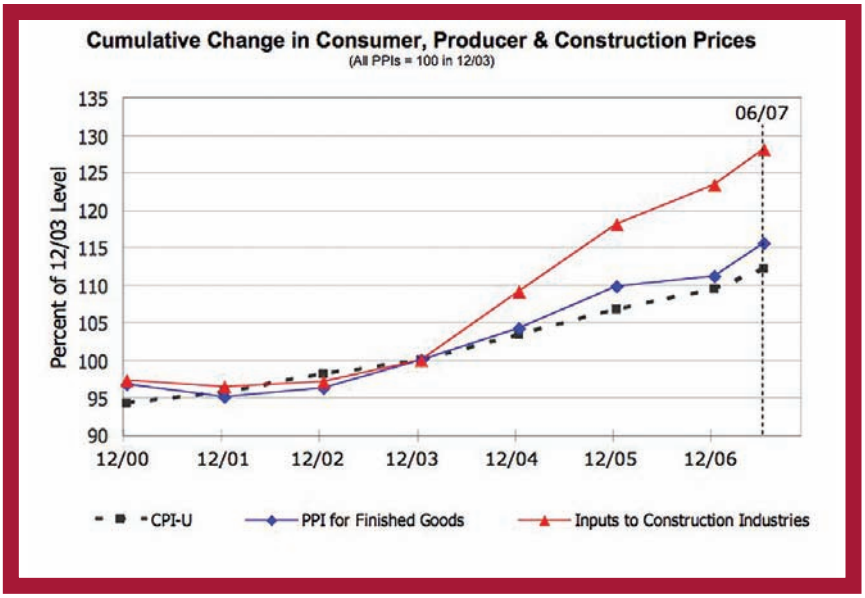
Asphalt, while dependent on the same refining process to create one of its raw materials, is also a finished product with its own supply and demand cycle to drive prices. With paving prices running up 15-20% at the opening of plants in spring, it appears that many municipal and state contracts were trimmed or cancelled because budgets hadn't been increased. No data is available on just how much paving demand has been suppressed by the higher prices but bidding for paving put in place in August has been competitive, and prices have moved downward into the mid-low $30's per yard range.

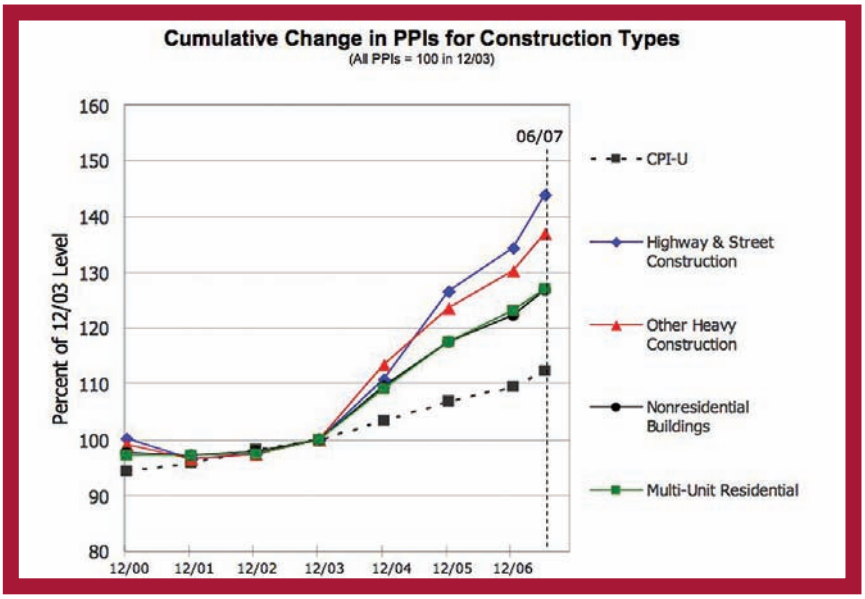
The other product which spiked in the second quarter was copper, which rose 17.3% during that period. Copper will probably continue to be volatile until the national commercial construction market cools, as its supplies are more limited compared to other basic materials, and mining capacity isn't being increased at the same pace as demand.

Some of the other materials and products that had been rising earlier in the year have leveled off or are now falling.

Structural steel shapes and tube products prices cooled during the second quarter, and have backed off slightly in the recent two months. Natural gas and cement prices both declined to a less than 2% increase from April through June.

As might be expected, the repressed demand for housing, which is roughly 40% less than in June 2005, has created an oversupply of lumber, plywood, drywall, and other primarily residential materials. Even with strong non-residential construction to boost demand somewhat, the overall pricing for these products will remain lower than past years.





Trend for national consumer and producer prices for construction based on December 2003 levels (source AGC of America).

PERCENTAGE CHANGES IN COSTS	to June 2007 over past--		
	1 mo.	3 mo.	1 yr.
Consumer, Producer & Construction Prices			
Consumer price index (CPI-U)	0.2	1.5	2.7
Producer price index (PPI) for finished goods	-0.4	1.8	3.3
PPI for materials and components for construction	0.3	1.3	2.3
Costs by Construction Types			
Highway and street construction	-0.6	3.7	3.6
Nonresidential buildings	0.1	2.1	2.5
New warehouse construction	0.0	-0.3	6.0
New school construction	0.7	0.6	11.9
New office construction	-0.1	0.6	7.2
Multi-unit residential	0.2	1.4	2.8
Single-unit residential	0.3	1.1	2.2
Costs for Specific Construction Inputs			
#2 diesel fuel	0.5	3.4	-7.8
Asphalt (at refinery)	3.3	3.0	-5.0
Asphalt paving mixtures and blocks	0.1	1.1	7.7
Concrete products	0.1	0.2	4.5
Brick and structural clay tile	-0.1	-0.4	1.0
Plastic construction products	0.8	1.1	-0.9
Gypsum products	0.4	-7.3	-13.3
Lumber and plywood	1.4	1.3	-5.4
Architectural coatings	-0.1	-0.3	4.5
Steel mill products	0.4	3.3	10.6
Copper and brass mill shapes	2.1	17.3	4.8
Aluminum mill shapes	-0.5	0.3	2.5
Prefabricated metal buildings	0.7	1.4	4.1
Costs for Basic Inputs			
Crude petroleum (domestic production)	2.9	13.0	-6.5
Industrial natural gas	1.8	1.7	12.1
Plastic resins and materials	0.8	2.3	-1.3
Construction sand/gravel/crushed stone	0.0	1.0	8.7
Cement	0.0	2.3	6.3
Iron and steel scrap	-0.9	-13.7	7.0

Two trends that are likely to create an extraordinary increase in demand to some degree in the near future will be the beginning of the first large-scale reconstruction efforts in the area effected by Hurricane Katrina in 2005, and an expected increase in bridge construction that should follow the heightened inspections in the wake of the tragic I-35 bridge collapse in Minneapolis.

Permits for commercial construction in Jefferson Parish and New Orleans, LA reached $500 million during the first half of 2007, a volume that surpassed the previous 15 months. Assuming that this is a trend that will continue, demand for drywall, lumber and most commercial building products will get a needed boost that could put pressure on pricing and availability.

The bridge replacement and reconstruction that results from the increased awareness and inspections may have a significant effect, but on a limited scope of materials. The magnitude of the problem won't be known until the last few months of 2007, and any pressure on demand for cement or steel which results won't be felt until 2008. BG

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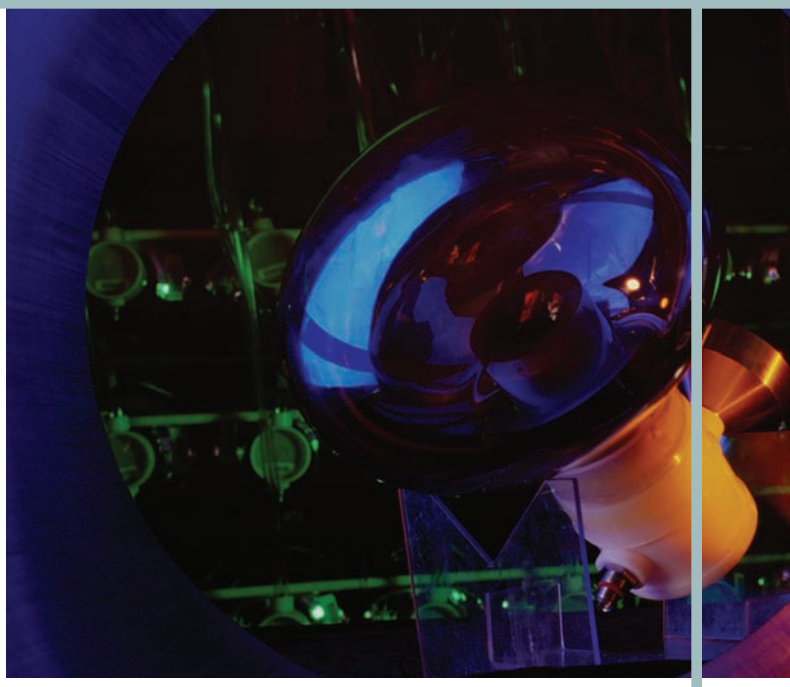
New Technology is Creating New Opportunity

One of the ways in which we humans use language is to give extra weight to words or phrases that are meant to convey importance to the things we are doing. We create buzzwords. The use of language in the past generation has upped that practice further by using hyperbole to add even more significance to everything we describe. Our buzzwords become ultimate or extreme buzzwords (ultimate and extreme have grown from adjectives to buzzwords themselves).



That's how the word technology evolved to mean such new and shiny things. In reality, technology has to do with making or crafting means to adapt the world around us to our current purposes. In that regard, construction has always been one of the highest technology industries. The development of tools to replace slower tools or methods has been at the root of the growth of design and construction back to ancient days.

As we view technology today, the word has become almost inextricably linked to computers. For design, construction and real estate, the same is mostly true as well. For economic development, particularly in former industrial centers like Pittsburgh, technology means something more akin to the classic definition. New ways of adapting the world to our needs generally means new jobs, and growth to a region.

Most of this edition will focus on the technology that is making an impact on how architects, engineers, developers, contractors, etc., are doing business. But, focusing the economy of Western PA on technology has been a strategy that has worked to turn around a region, and the businesses that have grown by innovating and delivering new technology have provided the demand for a large percentage of the construction that has been put into place over the past twenty years.

Building for Technology

Construction since the end of the 20th century has gone from boom to bust to boom again in Western PA. The biggest spending during that period has been for entertainment/recreation, healthcare, education, retail, and housing.

The last category, housing, has been the biggest category for new construction spending every year, with an average of three-quarters of a billion dollars put in place annually. In this decade nearly 25,000 new single-family units have been built. Regardless of what is published by the Department of Census, or what you might fear about the influence of subprime lending, the vast majority of these houses came from jobs.

In 2005, the Bureau of Labor Statistics did a mid-decade study on job creation nationally in the preceding five years. What it found was that more jobs had been created in healthcare, higher education, and science/engineering fields in the metropolitan Pittsburgh area than the national average. In healthcare and science, the rate was nearly double the national rate. While the healthcare jobs have a lot to do with the demographics (and that's true nationally), the growth in education and science/engineering are the result of Pittsburgh's leadership in the research and development of new technologies.

Looking at the construction of the same era in the region bears out the strength of those same sectors, with a special emphasis on technology research and development. In Oakland, the biggest projects at the individual universities and in private sector were Pitt's Biomedical Science Tower 3, the Collaborative Innovation Center (CIC) at Carnegie Mellon, and the Rand Corp. building developed by Elmhurst. Each of these buildings was developed for multiple tenants whose purposes were the pursuit of new technology. And each has been very successful once opened.

The current crop of education-related projects being developed, CMU's Gates Center and CIC2, and Pitt's Falk Hall Expansion, can trace back to technology demand.

In healthcare, the application of new technologies in surgery, diagnostics and therapy have created demand for a $100 million plus cancer center, and more than $100 million in clinical renovations since 2000.

Another job sector that the region graded out surprisingly well was in production jobs. While production jobs did decline in the region, the 17% pace of decline fared better than the national rate of 19%. Because most of the manufacturing jobs lost were lost due to lower labor costs overseas, the jobs that stayed were in industries where the worker added more value than the higher wages cost. Those jobs were mostly technology-related.

A glimpse at the major manufacturing construction projects this decade reinforces that observation. High-tech manufacturers Medrad and Respironics have built hundreds of thousands of square feet each, and the new Westinghouse Nuclear facility will add more than 700,000 square feet of engineering and research space to Cranberry Woods.

As non-residential construction continues to steamroll into 2008, some of next year's meatier projects will be tech driven as well. Contracting has begun for the Ferchill Development's $46 million, 150,000 square foot Bridgeside Point II research and office building, the last building in the Pittsburgh Technology Center. Mellon Bank has plans to double its data center in Northpointe Business Park in South Buffalo Township in Armstrong County. UPMC should start work on its Hillman Cancer Research facility, a project that is planned to have at least 200,000 square feet of research space.

Building with Technology

On the tool side of the industry, construction and design have always been innovative businesses. The problem-solving nature of contracting, and the creative side of architecture and engineering lend itself well to developing new methods for getting the job done. As computers have become smaller and more powerful weapons, construction and real estate have made increasing use of them, belying the stereotypes that the industry portrays.

At the root of the appetite for advancement in technology is the need to keep pushing the costs of the business down. On a global level, you can blame the 'WalMart mentality' or whatever your favorite metaphor for the commoditization of services is. Here at home, that drive comes from the intense competition that results from too many good contractors, architects, brokers, consultants, etc., for the amount of available work in Western PA.

Technology improvements are the keys to remaining competitive and maximizing profitability throughout the industry. Getting the most out of emerging technologies requires building that staff of people that are experienced and knowledgeable about how your business makes money, and interested enough in new technology to stay current. In smaller firms, the challenge is that with less people on staff, your odds are lower of finding that well-rounded person described above. For large firms, the problem is that the organizational tendency towards specialization yields IT departments whose people didn't come from operations, and vice versa, and that business inexperience is hard to replicate.

With the focus on computers and the Internet it's easy to overlook the advances in equipment technology that have helped more construction get done for less money over the years. Lasers, satellites, and mobile communications have allowed field engineering to be done more accurately and quicker. The same technology can give a bulk earthwork or concrete contractor big productivity gains. Advances in manufacturing and materials has made it possible for heavy equipment to be lighter, safer and more maneuverable, again getting more work done with less effort. Cranes can go higher. Scaffolding is safer and faster to assemble. Hydraulics replace pulleys, and on and on…

On the information side of technology, advances seem to be focusing in on enhancing communication and

collaboration by using databases and the Web. The applications of these improvements are becoming widespread across the industry. In fact, there are opportunities to link these applications from design through property management. What the recent history has shown is that firms open to such technological collaboration tend to benefit most and grow faster. In many examples, the new technology application, like using websites to distribute documents or sharing building leasing data, becomes the norm in very short order.

The principal advantage of greater collaboration is in the expansion of the talent pool with whom a firm can work. Pittsburgh has long been a business city with a lot of international relationships. Those relationships have provided opportunities for even small architectural and engineering firms to design projects overseas, or for specialty contractors to work beyond our borders. Even the geographic scope of the regional business being done by contractors, or real estate brokers, has broadened. The effect of that broader, even global, market is increased exposure to firms whose experience would benefit other projects.

Wireless and wide area networks now can accommodate the collaborative input of consultants from out of town, or out of country. If yours is a service business, like most in the construction industry, you can bring a better team to the table for your client if there are no geographic or time zone limitations.

The Internet has proven to be a boon to the commercial real estate business. First used to help differentiate the broker or market the company's properties, website applications now allow full service real estate firms to use the Internet to enhance those services.

One of the most powerful Web-based tools that have been developed for the property management business is the work order website. At their most powerful, these sites are databases of tenant information, which allow tenant requests to drive work orders for maintenance and repairs. Because of the database underlying the service, dispatches can go automatically with accurate information about the tenant's location, the location of the equipment or system that serves that space, leasehold rights for billable or non-billable work, and tracks the request through to a completed repair.

Developments devoted to spaces for new technology, like the Pittsburgh Technology Center, have succeeded in Western PA and throughout the country.

Most have database management tools that allow the property manager to understand better what is going on in the building, anticipate problem areas, or manage tenant satisfaction better.

CB Richard Ellis has taken a step further creating a Web-based portal, called AXIS Portal, which creates a building-specific website that acts as a property management, communications, marketing and information management tool. Tenants can use AXIS to get seamlessly into the work order system. Building or community events are posted. Tenants can use the site to announce their own events or to look for services. Floor plans are posted and used to announce vacancies to the rest of the real estate community. For the building owner, important documents like leases, contracts, or plans, are stored for their use.

The appeal of Web-based tools like these is that the cost of data storage, software maintenance and updating, or capacity management are built into the server contracts. Servers share the economies gained by hosting multiple clients, and the customer can limit his or her cost, and the expenses of an IT department.

Contractors may have benefited the most from the use of office technology, especially since the emergence of easy-to-use application software like Microsoft Word and Powerpoint coincided with the increase in the need for contractors to get more sophisticated in their marketing. By the mid-late 1990's the need for presentation or prequalification materials had become weekly, and today it's as commonplace for a contractor to interview or respond to an RFP as it is to bid.

Estimating and project management software applications have reached near saturation point with contractors, and, like other information technologies, the newer development may be aimed more at integrating those tools with accounting, payroll and purchasing programs so that the estimating plan and assumptions drive the schedule, and the related financial software can assimilate that information accurately.

As one of the three key parties involved in a project, the contractor will bring a lot of value to the model in a building information model (BIM) project. Because contractors tend to be more engaged in the daily marketplace, they will be in the best position to add information concerning costs, constructability, and availability to the model. BIM software was developed by the manufacturers of design software like Autodesk, so the architectural community has been first to embrace it. Increasingly, though, the word is spreading nationally through word-of-mouth and promotion by the contractors associations, and adoption of BIM into contractor's systems is growing. In the spring, when *BreakingGround* profiled BIM as an emerging trend, all of the contractors from Western PA who have done larger federal work had taken a wait and see attitude. As of now, each had invested or is investigating the integration of BIM into their processes.

It's likely that BIM will be the next big technology tool to break through the barriers of acceptance. Many of the communications advances that are developing will be furthered by the need for real time collaboration that BIM demands. It's also likely that the cyclical non-residential contracting slowdown that will occur within the next few years will inspire new technologies to further improve productivity, enhance customer service and sharpen the industry's competitive edge that much more. In Western PA, the regional commitment to fostering an economy based in new technology has built an infrastructure to grow and attract more businesses. The demand for space from these current and future technology companies will keep the construction industry building for technology as well as with it. BG

Project Profile

The Grant Street Transportation Center Uses 3-D Modeling to Build

It's probably appropriate and ironic that in a city striving to shed its blue collar image, the first major project to use 3-D modeling to drive construction would be (drum roll please) a parking garage. While there are a lot of sexier projects being developed right now, the challenges presented to the design of the Grant Street Transportation Center (GSTC) made for a natural application of model-driven design and construction.

The project represents a good study of making the best of a tough situation. The old Greyhound terminal had aged to the point where the company needed to make significant renovations, and the garage provided parking for only 150 cars. The Parking Authority was looking to add cars to the Cultural District end of town, but no other sites were available. "(GSTC) gave us a chance to have a marriage like we did with the Port Authority on the First Avenue garage," says David Onorato, Executive Director. "The building could look like something besides a parking garage."

The Pittsburgh Parking Authority has made a conscious effort to develop architectural garages, renovating facades on older garages over the past five years, and ensuring new garages had design integrity. "The First Avenue garage looks like a high-tech building as you approach it," explains Onorato. "We don't want our garages to look like warehouses for cars, so we planned the Grant Street project to stand out." The striking elevations also give the Greyhound terminal a better identification than in the past.

The decision to use the GSTC as a showcase building meant that the site would have to be used in an extraordinary way to maximize the return in exchange for the design elements. The business plan required parking for 1,000 cars, and a full-service Greyhound terminal to fit on a one square block site. And the site itself was one that had enough headaches to discourage building anything on it in the first place.

Here's a brief litany of the more challenging site conditions: The entire 1100 block of Penn and Liberty Avenue is bisected diagonally by a Norfolk & Southern Railroad trestle. The business plan required that the building use

Rendering of the GSTC Liberty & 11th Street elevation in daylight Image by StudioI.

the entire site, up to the sidewalks, on all four sides of the building. A bank of Verizon lines, housed in a delicate brick enclosure nine feet below grade, bisected the site in the opposite direction to the railroad line.

Tammy Greene was the project architect for IKM Inc. She says the site was the dominant challenge to the design. "The railroad trestle on site greatly dictated the floor plate geometry, ramp configuration, and ultimately the post tension slab and beam design for the West Garage," says Greene. "Once the site setbacks were considered it was determined that the best design involved two garages with a separate entrance and exit, pay lobby and elevator towers for each."

If that wasn't an unorthodox enough solution, the design of the West Garage would add another level of complexity. The site bisection left a triangular site on which to place the West Garage. To maximize the parking the ramps would rise through the center of the garage, leaving a structural design with complex and compound angles throughout, and nary a single level surface. Because there were so many differing angles involved with each beam and column intersection, an accurate plan would be difficult in two dimensions, so a model was created using AutoCAD 3-D.

"A 3-D model was essential for a proper understanding of the complex slab and beam design," says IKM's Greene. The model was also important because it could be used to drive the fabrication of the concrete forms used to pour the structure. "There are so many places where three and four beams connect at different angles that working from 2-D plans and details would take forever, and there would be enormous waste," explains

Grant Street Transportation Center Contractors

CM/General Contractor	Massaro Corp.
Foundation/Site Contractor	P. J. Dick Inc.
Plumbing Contractor	W. G. Tomko & Son
Electrical Contractor	Lighthouse Electric

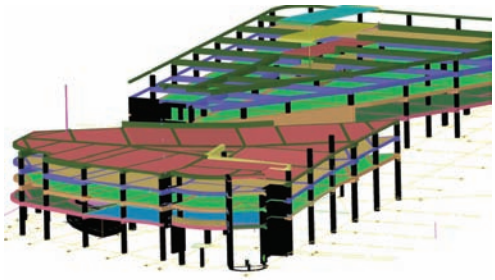
Left-to-right IKM President John Schrott, Massaro's Pat Stone, Bobby Turcic, Brian Miller and Matt Hansen of IKM.

Pat Stone, project manager for Massaro Corporation, the project's construction\manager. "The 3-D model lets us produce the connections and slab interfaces with the precise angles and dimensions, with complete reliability."

Massaro's George Sirochman is responsible for taking the construction document model and creating a 3-D model as construction progresses. From a desktop PC in a site trailer, Sirochman produces drawings with enough precision that the fabrication shop can do the carpentry of the formwork directly from the model for that day's work.

The modeling also makes the engineering, layout, and sequencing of the post-tensioning easier to plan. "The shape of the site, the sound and vibration considerations of an active rail line in the middle of the buildings pushed us to the post-tensioned structure," points out IKM president John Schrott. "This market has almost no experience with a post-tensioned building this size." Pat Stone laughs, "We haven't done a post-tensioned, triangular, seven-story building in a while, so having a structural model is pretty helpful."

The tensioning is made more difficult by the geometry of the West Garage. "There are over 10,000 cables being stressed," says Stone, "On the triangular sides of the building there is enough stress that the structure wants to twist into itself. It's only fractions of an inch but over seven floors it would be enough that nothing would fit on the upper floors."



AutoCAD 3-D model of the GSTC.

As challenging as the design was, it's probably no surprise that the contracting was not a piece of cake either. Massaro Corp.'s involvement was a result of having a consulting construction management contract with the Parking Authority at the beginning of the decade. While IKM was designing the GSTC, Massaro was doing preliminary budgeting, and bid day budgeting of the concrete superstructure. Before the project could advance any further it went on hold for a year as a result of the City's financial issues. When the project came back to life in spring 2005 the superstructure bids came in $5 million over budget. Massaro was concerned that the unique conditions of the market led to a non-competitive bidding environment. Their suggestion was to let a foundation/site package, and to package the remaining general trades with the concrete superstructure. The combined packages still weren't large enough to attract the larger post-tensioning contractors to bid, but Massaro was still very comfortable that their budget was good enough to use it as a guaranteed maximum price.

Norfolk & Southern train rolling between the two halves of the GSTC.

The Parking Authority decided to pursue a way to conduct a public bid, and have the security of Massaro's GMP. The solution was to bid the general portion of the project publicly with Massaro's GMP published for the other bidders to see. Both the Authority and Massaro were prepared to live with the result of bidding against the GMP. On bid day, none of the other bids ended up lower than the Massaro number.

In addition to Massaro's package, separate contracts were awarded for the foundation/site construction, and the building's mechanical and electrical work. All told the 454,000 square foot building will cost $43 million, including the Greyhound terminal, underground fuel storage tanks, and retail shell space along Liberty Avenue. The superstructure should be complete in October, and Stone points proudly to the fact that there has been only one change order to date. "Even that was just a shifting of the over-excavation from the foundation contractor to our contract, which was a net zero cost to the owner."

Tammy Greene is please to see the project coming closer to the vision of a signature building in a high-profile neighborhood. "I love the building elements at the corner of 11th Street and Liberty Avenue," Greene says. "The 131 foot high glass elevator tower and the 67 foot high conical white polycarbonate 'sail' element will be a striking focal point at the end of Grant Street." BG

Firm Profile

FAST-CAT Brings Portable Plans to the Field

What's the value of two hours? Two hours goes by fast in most business days. In that time we can watch most movies, or prepare a pretty good meal, or we could watch about six innings of baseball or most of three quarters of a Steelers game. For a construction superintendent, two hours can make all the difference in running a successful job.

Finding those two hours each day is one of the main goals of FAST-CAT, a hand-held device designed to put the latest working set of construction drawings into the field supervisor's hands, and allow those drawings to be portable throughout the site. "One of the realities of the industry is the superintendents have ten hours work in an eight-hour day," says Ray Steeb, President of Field Assistant Systems Technology (FAST). "Superintendents understand that's part of the job. It's when the ten hour day becomes twelve that you start to lose quality and people."

Steeb is a career construction guy, working as a project manager and eventually Vice President for Turner Construction in Pittsburgh. When he parted ways with Turner in 2002 he was not planning to return to contracting, until an opportunity to start his own firm came to him. During that same time, however, another opportunity came to him that would ultimately lead him down a different path.

FAST-CAT owner Ray Steeb views project documents at the jobsite.

"In April 2002 I was at a function where I ran into Jared Cohon from CMU," recalls Steeb. "He asked if I would be interested in working with the university to get their technology developments out into the marketplace." Cohon introduced Steeb to Jim Garrett, who was trying to develop something specifically for the construction industry, rather than adapting technology to construction.

The FAST-CAT Toughbook allows for hand-held viewing and communications with portable, current documents. More information is at www.Fast-Cat.net.

Steeb steered the project toward an area he felt was untapped - the field."One of my interests was in focusing on the field staff, which never seemed to get the tech improvements. They had first year students interview hundreds of superintendents to see what they needed," explains Steeb. "The low-hanging fruit was portable documents-a way to have access to current documents without running back and forth to the trailer."

For the next couple of years, through 2005, the concept underwent engineering to create a durable, portable device for viewing documents, and then extensive software design and proof of concept testing in the computer schools at CMU. Steeb got to see first-hand the conundrum that haunts technology transfer to industry at research universities. The emphasis at universities is on publishing groundbreaking research, whereas industry works towards patents. As you might imagine, the urge to get to research published has an equal but opposite urge to keep competitive advantages secret until patented.

As the dust cleared at the end of development, FAST-CAT became a working prototype that was tested in the field during 2006. Using it on his own company's projects, and then getting use from other contractors, such as P. J. Dick Inc., Steeb began to see how FAST-CAT would be different from any similar devices.

"We offer end-to-end service – hardware, software, communications and installation- which no one else does," says Steeb. "Because of that all the information flows through FAST-CAT, which gives communications channel control to the project manager, so that the PM knows the superintendent has access to the latest set of all the documents."

The emphasis on an innovation that focused on current documents and channel control makes FAST-CAT a productivity tool that also has the potential for improving installation quality as well. Field staff can look at the drawings and specs right at the location of any questions

on the jobsite. Questions and notes can be handwritten and saved to the documents permanently (with date/time stamps and signatures saved). The same forms are used for jobsite reporting. The RFI process is compressed, which allows superintendents more time to ensure proper installations. And the fact that all the data flows through the master set of documents, which can be continuously synched with the field set, means that the risks associated with independent field decisions are all but eliminated.

Steeb points out the importance of current documents. "I always said that if you give me five minutes on a jobsite that I could find someone using the wrong set of plans. That might not mean the wrong documents will cause a problem at that moment, but it eventually will." Resolving conflicting documents costs time and money that could be better spent moving the project forward.

The contractor isn't the only member of the team who benefits from FAST-CAT's technology. "After the job the owner has accurate as-built drawings – accurate for all time- and a record of the decision path," explains Steeb. "Besides maintaining the contract documents themselves, FAST-CAT saves all the cut sheets, shop drawings, even photos of mockups."The technology eliminates the costs and time associated with drawing reproduction, which is appealing to the project's architect and engineers. And, again, the control of the communications channel ensures the designer that his or her instructions flow through the project manager to the field, and are stored with the master documents.

Contractors who have tested FAST-CAT seem to get that the real payoff is in their increased productivity and accuracy. Ray Steeb gives an example, "Say you have three carpenters working in an area, and a question arises that stops work. If you have to wait for written instructions you're probably waiting two hours." FAST-CAT allows for a written response to be communicated in minutes. "A carpenter costs a contractor $60 an hour. If we can save three carpenters three hours downtime, that's more than the $500 per month charge," says Steeb.

When FAST-CAT became ready for rollout in March 2007, it became obvious to Ray Steeb that it would be impossible to operate a contracting business and FAST-CAT, so he has been closing out the final Steeb Crawford projects, and will devote himself full-time to FAST-CAT in the fall. That will give him the time to find field superintendents those elusive two hours. BG

Legal Issues for Construction Projects Utilizing Building Information Modeling(BIM)

By Tim Cornetti

The increasing use of Building Information Modeling (BIM) in construction projects has significantly changed the traditional roles of Owners, Constructors, and Designers as well as the approach to a project. No longer is each solely responsible for their discrete scope of work. Instead, a project that successfully utilizes BIM requires that each party be involved in the collaborative effort to ensure that a project is completed on time and on budget. All three parties must buy in to the project team approach and share in the financial risk of the project. Owners, Designers, and Constructors must assume roles beyond their traditional ones. This blurring of the traditional roles and responsibilities requires that parties to a BIM project redefine their legal obligations. Traditional construction contracts must give way to new agreements, which reflect the collaborative process and buy in concepts required by BIM.

Building Information Modeling is a three-dimensional, digital representation of building processes that allows the timely exchange and modification of building information in a digital format. BIM includes three-dimensional modeling of design geometries, building components and spatial relationships, and can be used to exhibit the processes and phases of construction. The intent of BIM is to have the Designer, Constructor, and Owner provide immediate input and modifications to design, as well as the methods and means of construction in real time. Critical to the successful use of BIM is that each party will have access to and the ability to make modifications to the building model.

In the spring of 2007, the American Institute of Architects (AIA) published two new standard form documents dealing with the design and construction industry's leap into the digital age. The C106™-2007, Digital Data Licensing Agreement, and the E201™-2007, Digital Data Protocol Exhibit, allow contracting parties to share digital data in accordance with agreed-upon protocols for transmission, format and the use of the data. Along with addressing ownership rights to the digital information, the new documents also establish procedures for the transmission of digital data. These two new documents are the first from AIA that addresses digital documents. The next document to be created from AIA is an agreement between the owner and a design and construction team for the delivery of a project using Building Information Modeling.

In order to address the legal issues related to the use of BIM, the Construction Industry Contracts Council is currently drafting a model "Standard Form of Tri-Party Agreement for Collaborative Project Delivery," identified as Consensus Document 300, which would significantly modify traditional construction contracts.[1] Instead of the traditional contractual structure where an Owner enters into two separate contracts, one with the Designer and one with the Constructor, the Tri-Party Agreement brings all three parties within a single agreement. The stated rationale for the Tri-Party Agreement is that a project's objectives will be best achieved "through a relational contract that promotes and facilitates strategic planning, design, construction, and commissioning of the project through the principles of collaboration and lean project delivery."

Fundamental to the Tri-Party Agreement is the expectation that each of the parties will work in a collaborative effort to ensure that the project's interests will be best advanced through openness, timely exchange of information, and fair dealing between the parties. Consistent with this approach, the Tri-Party Agreement also contemplates that all three parties will share in the cost savings and losses on the project. Under the model Agreement, a project budget is established following completion of the design, which then becomes the project's target cost estimate. Should

the project complete within the cost estimate, the parties will share in the savings. Should the project exceed the cost estimate, the parties will share in the losses. The model Agreement does contemplate a limitation to the losses to be incurred by the Designer and Constructor to be determined on a project-by project basis. In many respects this cost sharing arrangement mirrors elements of Guaranteed Maximum Price (GMP) contracts, with the distinction that all parties have contributed to the design phase.

The model Tri-Party Agreement contemplates that the Constructor and Owner will "assist the Designer" in the design of the project. It also carefully states that the Constructor will not be deemed to have engaged in the practice of professional services (architecture or engineering) unless such services are within the Constructor's scope. Further defining the responsibilities of the Designer, the Tri-Party Agreement makes clear that only the Designer is the party who retains the obligation to have overall responsibility "for all design decisions as required by applicable state laws." These concepts are not very different from the roles assumed under traditional construction contracts. However, requiring design input from a Constructor during the design phase departs from a Constructor's traditional role.

The Tri-Party Agreement also contemplates the creation of a "Management Group" which will be comprised of a single representative of the Owner, Designer, and Constructor. The representatives of the Management Group are intended to serve as the decision-making body for the delivery of the project, each of who have full authority to bind their respective entities. In many respects the Management Group will serve the same role as a Construction Manager.

The model Agreement also includes a provision that identifies "safe harbor decisions" as decisions that the parties have jointly reached regarding the construction of the project. If a decision is a "safe harbor decision" the parties agree that they are immune from liability to one another for all events that directly flow from the "safe harbor decision." For instance, should the parties agree to resequence and adjust the construction schedule due to delayed delivery of materials, the Owner, Designer and Constructor will not be liable to one another for additional costs or time. The theory underlying this provision is that when the three parties work conjunctively to reach a decision on the project and mutually agree to that decision, it then becomes a "safe harbor decision" for which none of the parties may be legally liable to one another. While the parties agree to waive any and all claims related to "safe harbor decisions" by and between them, they also agree to share equally in any liability to third parties for such a "safe harbor decision." For instance, should a subcontractor claim that a "safe harbor decision" impacted it; the current Tri-Party Agreement contemplates that each of the signatories to the Tri-Party Agreement would be equally responsible to the subcontractor for that claim. If successfully implemented, this arrangement should significantly reduce claims between the Owner, Designer, and Contractor and reduce project risk of claims from third parties who will be confronted with the united front.

..... a project that successfully utilizes BIM requires that each party be involved in the collaborative effort to ensure that a project is completed on time and on budget.

BIM and the collaborative construction agreements such as the Tri-Party Agreement will only be successful where an Owner, Designer, and Constructor are committed to working as a team. They will be of little value on projects where each party places its own financial and risk interests above those of the project. However, where all parties are committed to advance the project, both BIM and the collaborative construction agreements may be of substantial value.

Tim Cornetti is a partner with Reed Smith LP. His practice concentrates on commercial and construction litigation and construction contracting.

1 For this article, the CICC has provided a draft version of Consensus Document 300 for review. The final version of that document is scheduled to be released in the upcoming months.BG

Liquidity Problems Aren't New in Construction or Investing

Even a casual investor can't escape the headlines and hand wringing over the fallout from the risky lending practices commonly referred to under the sub prime heading. While the actual exposure of the financial institutions is still being revealed, albeit slowly, the more serious ramifications will come if the lack of liquidity in the market continues beyond the summer crisis and begins to strangle the strong non-residential construction growth that is present nationally and regionally.

The problems still seem to be mainly an issue for the buyers and sellers of residential mortgages. Just as a quick refresher, the liquidity crisis has evolved as the many financial institutions that bought and sold bundles of loans that included riskier 'sub prime' mortgages found that many of these loans were in default, and the demand for those loans dried up. The concerns created distrust for all mortgage-backed securities, and thus financiers found that they could no longer find buyers for these investments, even if the loans were of high quality. That market was, therefore, no longer liquid.

If the next step is for banks and lenders to tighten up lending across the board, then the spillover will have a dampening effect on the robust commercial construction market, and the economy in general.

There are a couple of very good reasons to remain calm and see beyond the panic to the potential upside of the credit crunch for the non-residential market.

First, one of the Federal Reserve's first responses was to pump billions of dollars into the market by becoming a buyer of high-quality mortgages. The next response will almost have to be a reduction in the Fed's interest rate. Aside from the positive effect this will have on the stock market, the commercial real estate market will also get a huge boost from even a minor reduction in the cost of borrowing.

Second, from a demand standpoint, the loss of faith in financial instruments as investment vehicles means that other investments will appear less risky and more desirable. As history as shown, the attraction of real estate as an investment rises when the perception of other investments fall.

These kinds of conditions, coupled with where Pittsburgh is in its economic history, make real estate in Western PA seem especially valuable. With the regional housing market already beginning to turn up in metropolitan Pittsburgh, and the perception of other major cities' risk being much higher, the investment appeal of our region is on the rise. The recent acquisition of major properties in downtown and the east end of the city demonstrate that our real estate market is on the radar of out-of-town buyers.

Liquidity has another meaning in the industry, particularly if you are talking to contractors or sureties. With Pittsburgh's non-residential construction market at an extended high point in the business cycle for the past 18 months, the subject of liquidity may seem far from the minds of the business people in the region. Yet, the time when contractor liquidity problems begin to build has historically been when the market has peaked and begins to turn down. While that point in the business cycle may be another 18 months or more away, paying attention now could ensure that cash is available to cover obligations as work begins to slow.

It is human nature to feel more pressure to pinch pennies when things are tight, and to be more forgiving in good times. Most experts see that tendency as how cash flow crunches begin. Tom Menk, a principal in Alpern Rosenthal's construction practice, sees a good market as the time to put better cash management practices to work. "The real key to contractor liquidity is to use project cash flow to finance the operations," he says. "Enter into contracts that have favorable conditions, with at least some accelerated billing so that the project provides the working capital." Menk feels that competition creates an environment where contractors concede on conditions for fear of losing work. A strong market is a good environment for negotiating fair conditions. Surety companies are in the midst of a third very solid year of business, but that followed almost a half-decade of fixing record high loss ratios, almost all of which trace

back to fatal liquidity problems. Sureties imposed extreme measures on the market to correct the excesses of its own industry and remediate bad contractor decisions. Jim Bly, of insurance giant Marsh USA, believes those measures were short-term solutions. "We'd like to see contractors maintain liquidity by working for good-paying customers, and developing accounts receivable policies that collect within 30-60 days."

Of course no financial advisor advocates the opposite, but their are no quick fix or store bought policy remedies out there that fit all size businesses. At the root of all good collection policies are a few common characteristics. Dick Spence, partner in charge of Hill Barth King's construction group says, "It's the basic stuff that can make a big difference: Make sure you get bills out regularly, even if you don't like paperwork, and get an understanding in advance of how the client requires the billing to be submitted."

Spence recommends getting everyone in the same room before the project starts, so that the owner, project manager and accounting all understand when and how the bills should be processed, who will need to approve them, and how cash flow should be projected.

Keeping those projections on target is a matter of staying in touch whenever there is a delay in payment. A quick phone call can resolve a question or move an invoice into the check-writing queue, and the best time to call is as soon as the payment becomes past due. Project management has a significant impact on issues that can affect payment disputes, and should be rewarded for managing that process effectively. "We recommend having bad debts and write-offs be considered with the PM's compensation," explains Dick Spence, "Where there are direct relationships to collection issues the project manager should have an incentive to manage them favorably."

One other side effect of good markets should be improved working capital positions. More work should lead to more profits, and more opportunities for capital reserves. Everyone involved in the financial sector of the construction industry will recite the mantra "cash is king," and using it wisely is as important as collecting it.

"It's important not to use working capital to buy long-term assets," points out Alpern's Tom Menk. Long-term assets can generate revenue that offsets the cost of financing, and frees working capital for operations. "It may be some normal aversion to debt or just the feeling that if there is cash in the bank at the end of the year it should be used," says Menk, "but better cash management is the better solution when times are good."

Whether you believe greater Pittsburgh is entering a cycle of extended development and construction or ready to begin a pullback, the cyclical nature of construction will eventually result in a decline. Managing working capital in the midst of a growth cycle is the surest way to prepare for any negative consequences a decline in construction will have. BG

MBE/WBE Company Spotlight

KMA Design

In many cases, re-branding an occupation or profession by giving it a new name is meant to divert attention (think 'sanitary engineer'). The designation 'environmental graphic designer' however, is intended to inform the uninitiated that the profession isn't about making signs.

Barbara Martin, CEO of KMA Design, knows that most clients have to be taught that a sign maker doesn't provide the service that a designer does, but the education process is a great marketing opportunity. "When we talk about wayfinding in a hospital, for instance, we can point out the amount of time wasted each day giving directions and translate that into dollars," she explains. "If you can tell the CFO of a hospital that the five minutes per day that each of the 200 employees spends giving directions costs the hospital $100,000 a year in wasted time, you get the CFO's attention."

When the Americans with Disabilities Act went into effect in 1992, Martin saw that the impact on graphics and signage would be significant, and seized the opportunity to start her own design firm in Orlando, FL. Her standing as a woman-owned business helped her land the signage design of the Orange County Convention Center as her first job.

In 1996, she moved back to the Pittsburgh area and founded Kerestes Martin Associates (her maiden and married last names). One of her early clients was the Beaver Medical Center, whose facilities manager, David Kosick, seemed to really get KMA's business. Kosick was interested in making a career change at the time and joined KMA to do business development. The partnership has been a fruitful one, as KMA Design has doubled its size since, and is working for clients nationwide.

KMA's clients are a diverse group, including Disney World, Robert Morris University, Tampa Bay Lightning, Mt. Nittany Medical Center, GlaxoSmithKline, and Butler Township. They have worked locally on PNC Park and the Peterson Event Center, and the Mohegan Downs project in the Poconos.

Prior to striking out on her own, Martin spent ten years working for an architectural/engineering firm, and gained experience at designing signage and graphics that work within the architectural intent of the building design. The integration of her design with a set of construction documents taught her the discipline of planning that she believes separates her from competitors today.

Barbara Martin and David Kosick of KMA Design.

KMA sees the execution of the documents as the logical extension of the planning process. KMA is often brought in to design a wayfinding program or to design signage and graphics that match an architectural design, colors and theme, then develops bid packages, shop drawings and does construction administration for their clients.

"We give our clients exceptional attention to detail," says Martin. "The documents inventory every sign to be demolished, show the details for mounting and the location of every sign, so that the client can go to any spot in the building and there is no doubt about what should be there. It's something positive I can do with my OCD personality," she laughs. BG

COMPANY FACTS

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Annual fees: $1,000,000
Number of employees: 10

How Do You Decide When to Invest in Technology

It's the rare occasion when we take the time to reflect on just how visionary the founders of Silicon Valley were when they looked at how the entire fabric of business and society could be changed by computers. While it's possible that they envisioned construction as a fertile ground for their innovations, it's unlikely that even they could see how pervasive the digital explosion would become for designers, developers and builders.

Something as simple as a dump truck is not beyond the influence. "We bought a number of trucks last year to support our asphalt business," says Cliff Rowe, CEO of P. J. Dick Inc. and Trumbull Corp. "They were all equipped with GPS systems. We're able to use the knowledge of where every truck is to reallocate them better than in the past. It really helps with productivity."

P. J. Dick/Trumbull is one of the few contractors in the region that annually tops the $100 million mark, usually working off more than $300 million in contracts throughout the mid-Atlantic region. They have a corporate CFO and business unit controllers, plus six full-time IT staff. It's the kind of organization that you'd expect would have formal technology committees or ROI justification forms, yet for most of its technology investments management experience guides the decision.

"Our operations people buy a lot for construction, so it has to be a pretty big expense to get to any sort of corporate approval process," explains Nick Cocogna, controller for Trumbull. "The business unit operations people know their businesses, and what will make them money or not. We might help decide how to finance the purchase but they justify their own expenses."

Mike Zavoina, CEO of Gateway Engineers, understands how influential experience can be in evaluating technology investments, but tries to have a systematic approach to balance that. "When we think we want to invest in something, like a new plotter for example, we don't look at return on investment because there are too many soft costs to account for," says Zavoina. "I like to look at the payback period and examine the hard costs. If we can track hard cost savings that pay back the investment in two years then it's an easy decision. Any soft costs or benefits are bonuses then."

Zavoina says that one of Gateway's disciplines is to create a three-year technology plan, which identifies the areas they might want to update a few years out, and then tracks the planning for the investment forward to the implementation budget year. "The second year weeds out the wishful things, and by the third year of planning an investment you'll have an implementation plan and understand the expense in detail," notes Zavoina. "It's hard to get surprised that way."

In Western PA the revenues of a small contractor and a large engineering firm are relatively similar. An average commercial general contractor will turnover $15 to $30 million in a year. This disparity in cash flow seems to have an influence on the buying process, as does the relative perception of risk.

Even though most of the general contractors contacted had some form of technology review process, usually a team of managers or executives, all expressed that they ultimately relied upon the experience, or common sense, of the team to decide the question. Nearly all also talked of investments in the same way a stock trader might, noting that some purchases just don't work out. Architects and engineers, whose businesses are smaller in revenue and involve less risk, tended to express a more analytical approach to the decision-making process.

(The anomaly seems to be developers, who frequently takes large risks and generate larger revenues, but approached technology investing with more caution.)

A surprising facet of the cycle of consumption of new technologies is that very few of the decisions were sparked by sales calls. One of the casualties of increased competition throughout the construction industry has been the decline of personal selling. Twenty years ago architects and engineers could count on being kept up-to-date on new building products by the company reps. Distributors sent sales reps out to call on contractors. But the business models of the high-tech companies have

not included an allowance for penetrating the market through high-volume selling, which leaves the buyers to rely on themselves to find new technologies.

"Most of the time our purchases are driven by someone inside the company seeing some new software, or noticing some equipment that another contractor has," says Dave Deklewa, President of Bridgeville contractor John Deklewa & Sons. "I have a hard time believing what the reps say will be the savings anyway," laughs Deklewa, "so we count on our employees to be knowledgeable, and generally they will be the ones to meet with a rep and set up a demo. Then we'll sit down and look at the numbers ourselves."

Most companies have come to expect that lower level managers and support staff will make contributions to keep up with technology. "At Trumbull we develop our own applications because we're a Lotus Notes shop, and we can develop a lot of improvements within Lotus Notes," says Nick Cocogna. "The developments almost always start with someone seeing something in an industry magazine or a trade show."

"We have a team of people involved in evaluating technology regularly as part of the strategic planning process," says Mike Roarty, Vice President at Mascaro Construction. "They are very open to suggestions from anyone in the company, or subs or wherever."

Keeping employees at all levels on the lookout for improved technology helps the company stay heads up, and gives everyone a sense of involvement. Another challenge in acquiring new technology, particularly for back office operations, is a successful match up with the company's culture. An efficient new phone system may limit human contact with the company's people. Project management software that shifts interaction with subs more to the PM may leave an administrative assistant feeling left out. The unintended human consequences of an upgrade in technology may undo the productivity gains.

In the end, the potholes in the road are minor compared to the damage that can result from not pushing to use technology to improve how your company serves your customers or controls its costs.

It seems that the best answer to when to invest is whenever the opportunity presents itself. And the discipline of examining potential investments carefully will help limit the number of decisions that don't go as planned. "We have managers who really look at spending pretty reasonably," says Mike Zavoina, "But it's always good to go through the paces, even if it's just to make sure everyone remembers we're not playing with Monopoly money." BG

Trend to Watch

Improvements in Communication Make a Difference

In one of the climactic sequence of the movie Independence Day, Will Smith's character responds to being surprised by Jeff Goldblum's with the line, "We're going to have to work on our communication."

That could be the tag line for the construction industry since time began. While there's no technology available today that can force people to talk to each other when they don't want to, there have been a number of significant advances made in the past year or so that can improve the process by light years.

There is little that is as frustrating in the process of developing, designing or building a project as the crippling delays that can result from even short periods of indecision. Until recent years the sheer size of construction drawings, even in conceptual form only, made it very difficult to get the drawings delivered electronically from the designer to the client for approvals. Even using email technologies of just a few years back, file transmission was impractical or slow enough that it was often easier to overnight plans. And, of course, until the client could see and understand an architect's design, he or she couldn't discuss and decide on direction. Days missed could turn into weeks of delayed schedules, or months of municipal review time lost.

Today, there are a number of ways to quickly move plans and project information from owner to designer to contractor, some of which can allow for review and revision to happen within the same meeting. Project websites, FTP sites, and high-speed transmission all allow for pertinent project information to be available for quicker decisions.

"The biggest advancements I see are in the things we can do with our phones," says Chad Brinkley, Vice President for CB Richard Ellis. "My phone is like a pocket PC. I'm linked to our server and instantly synched so that I can have access to documents, spreadsheets, or whatever I need to take care of a client's need."

Wireless technology advances now make handheld devices behave like virtual monitors, and can limit the number of 'meet now, respond later', meetings needed for each decision. Putting the technology to use in real-time situations can create a competitive advantage, not only in terms of how your client perceives you, but also in creating more opportunities.

> Taking steps to upgrade communications, however, can be as easy as spending a few hundred dollars more per year on wireless services.

"The best use of my time is spent away from my desk," says Brinkley, "If I can get to information I used to have to be in my office for, while I'm with a client or on the road, I save a huge amount of time."

Imagine the difference in responsiveness if design changes posed at the beginning of a meeting could be reviewed at the end of the meeting, after the project architect had made the revisions and had made them available for remote access. Think how often a tenant's space needs can change during leasing negotiations. Wouldn't it help to close a deal sooner if updated floor plans and lease agreements could show up on your Blackberry before the end of the meeting?

Providing that kind of information request and response in past required networks that were cost-effective for larger firms, or where fees justified the investment in the network. The increased competition in the server market has created an environment where the cost barriers are much lower, and add-ons to phones for data services can be $40 per month. In a business where it can mean tens of thousands of dollars to secure one more commission or tenant that might have otherwise slipped, or to pick up

days on a construction schedule, the cost/benefit analysis is quite favorable.

Another recent advance has been in the improvement of wide-area networks (WAN). Using linked servers or wireless connections, WAN's allow remote offices or traveling professionals to work the same networks as the home office. In the construction industry that has allowed for remote collaboration, and jobsite networking, but the reality of WAN technology has historically been that speed is diminished, security has been weak, communications have been 'noisy' and inaccurate, and the cost of adding infrastructure to add locations is not insignificant.

Wide-are file services (WAFS) have been developed to improve the performance of WAN systems. Using hardware and software solutions, WAFS create leaner networks and boost WAN performance to that of a LAN. Using file compression, packet and caching technology improvements, WAFS reduce processing times for large file updates (like engineering drawings) from five-to-ten minutes down to seconds. The vendors in the WAFS products are developing the technologies to respond to the estimate of more than 540 million mobile workers by the end of the decade; but, the application in construction and real estate is just as powerful for fixed work stations.

Butler architect Burt Hill has ten offices worldwide, with more than 700 professional employees. It began using WAFS earlier this year to take advantage of the experience of all its employees, regardless of their locations. "The WAFS allow us to staff jobs irrespective of where the architect or engineer is," says Mark Dietrick, Senior Associate in the Pittsburgh office. "The key to the technology for our use is that the file locks when someone accesses it, so the security of the data isn't compromised." Because the technology is primarily a communications improvement there is no inherent impediment to increased collaboration, no training needed. More than allowing designers to be assigned to work further away from home, WAFS encourage ad hoc collaboration from professionals not assigned to the project but with relevant experience. For Burt Hill, that can mean that an engineer in Boston can assist on a specific problem the State College office has in just a few minutes, and then return to his own work. The time taken could equate to a coffee break.

"Architects are migrating to it because of the time savings," says Dietrick, "Burt Hill invested $100,000 in WAFS technology, but a conservative ROI time frame was three months." WAFS allow for streamlining of infrastructure and the elimination of servers. And, of course the reduction in time allows for billable hours to be spent on other clients.

Services available for even small devices, like $300 cell phones, can eliminate days in decision-making.

The WAFS technologies that are emerging (Riverbed Technologies' Steelhead, and Packeteer's iShared are two examples) have solutions designed for small offices as well. Since the target market is branch office and mobile worker, there are a number of solutions aimed at the five-person office, most priced at $10,000 to $15,000.

Upgrading your company's technology often involves great expense and re-training. Making decisions about upgrading can be stressful, wrenching experiences. Taking steps to upgrade communications, however, can be as easy as spending a few hundred dollars more per year on wireless services. The steps forward in communication in the past 24 months have made possible huge strides forward in the process of delivering construction into the marketplace. If you're being asked to do less for more fee with no real delivery date, you can probably go back to sleep. If you are still looking for another competitive edge, maybe it's time to look at your communications one more time. BG

Best Practice

Making Interoperability a Top Priority

Interoperability is one of those topics that seem to have equal ability to inspire passionate debate and yawning. It's a hard word to type or pronounce quickly. Because 'not compatible' is a phrase that has been associated with computing since the beginning, interoperable systems and software are viewed like the weather: it's sometimes inconvenient, but nobody can fix it.

The practical definition of interoperability is the ability of information to be viewed or updated using differing software, hardware or communications systems. At its origins, non-interoperability stems from the limited number of developers creating computers or software, bringing their unique solutions into the market. For the better part of the first two decades of the digital age, non-interoperability was part of the competitive strategy of the computer industry, helping to keep customers tied to a specific vendor or system.

Over the years, interoperability has received small boosts from landmarks like the cloning decision, which spawned the proliferation of PC manufacturers and brought pricing down, and the negotiated truces between Microsoft and Apple, which allowed PC's and Mac's to be used toward the same business solutions.

In our industry, progress toward interoperability has been impeded by the many proprietary systems for computer-aided design (CAD) and estimating/project management systems that have been developed, as well as the many patchwork solutions created by designers and contractors to develop plans and specs, estimates or manage projects. Since the beginning of the 21st century, however, it has become apparent that there is much to gain by having all players in the industry using and updating project information, regardless of the systems employed.

Dr. Richard H. F. Jackson is Director of Austin-based FIATECH (an acronym for fully integrated and automated technology). Formed in 2003, FIATECH is a part of the University of Texas at Austin College of Engineering, and boasts members as diverse as DuPont, BP Oil, Flour, Army Corps of Engineers, Primavera, AutoDesk and the Construction Users Roundtable. Its goal is to foster the highest use of technology to promote integration in the capital industries. In an article in the May 2007 Insight magazine Dr. Jackson wrote:

> "What we don't know is what the shift to interoperability will cost. Obviously, we need new technology and staff training, as well as a new focus on how to do business. What we can demonstrate, however, is how much money and productivity are currently being lost because most systems are not interoperable.
>
> Not long after I moved from the National Institute of Standards and Technology (NIST) to FIATECH, we worked with NIST to do a study for the construction industry. That study showed that losses due to interoperability were conservatively placed at $15.8 billion in 2002. Among industry shareholders, owner/operators bore the highest share of these costs, and 85% of their expenses were incurred during operations and maintenance due to time spent finding and verifying facility and project information."

An August 2004 report, the *Cost Analysis of Inadequate Interoperability in the U. S. Capital Facilities Industry*, is based on the NIST 2002 study of the capital facilities construction industry, which includes commercial/institutional buildings and industrial facilities

The authors, Michael P. Gallaher and Alan C. O'Connor of RTI International and John L. Dettbarn, Jr. and Linda T. Gilday of the Logistics Management Institute, examined design, engineering, facilities management and business processes software systems, and redundant paper records management across all facility lifecycle phases.

In addition to the $15.8 billion in annual interoperability costs quantified by the study, NIST estimates there are additional significant inefficiency and lost opportunity costs associated with interoperability problems that were beyond the scope of their analysis. "Thus, the $15.8 billion cost estimate developed in this study is likely to be a conservative figure," the report states. Examples of inefficiencies cited in the report resulting from inadequate interoperability include manual reentry of data, duplication of business functions, and the continued reliance on paper-based information management systems. Three general cost categories were used to characterize inadequate interoperability: avoidance costs, mitigation costs, and delay costs.

- Avoidance costs are related to the activities stakeholders undertake to prevent or minimize the impact of technical interoperability problems before they occur.

- Mitigation costs stem from activities responding to interoperability problems. Most mitigation costs result from electronic or paper files that had to be reentered manually into multiple systems and from searching paper archives. Mitigation costs may also stem from redundant construction activities, including scrapped materials costs.

- Delay costs arise from interoperability problems that delay the completion of a project or the length of time a facility is not in normal operation

Until the problem is solved in an integrated manner, interoperability is normally achieved through one of three methods: point-to-point and project-to-project translation, mandated use of proprietary tools across an industry, or the use of neutral or open data standards.

Clearly the sheer numbers and independence of the players in the design and construction industry make the first two alternatives unfeasible, if not laughable. Neutral or open standards, however, are being used within subsets of the industry, and moreover, are being pursued as the means to achieving complete interoperability worldwide.

The American Institute of Steel Construction cited an example in its white paper of November 2006, of an addition at Lansing Community College in Michigan. The steel fabricator discovered an opportunity to redesign the structure, reducing approximately 700 steel members while increasing the thickness of the floor slabs. The changes resulted in a lighter, more rigid structure, and saved $315,000. What's noteworthy is that the redesign was done during shop drawings using software with neutral standards, allowing for seamless transfer between fabricator, contractor, architect and engineer. The real payoff, of course, was that this major change did not result in a schedule change.

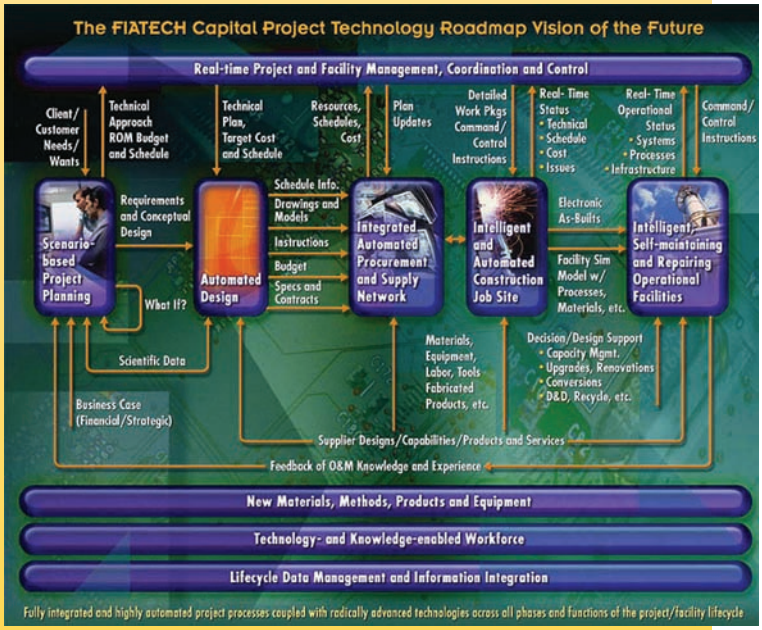
The creation of completely interoperable information systems for the design and construction industry is getting momentum now from the sheer number and variety of organizations pursuing independent efforts, each of whose progress adds inertia to the end result. What might be a significant catalyst towards more mutual efforts is the growing market share of building information modeling (BIM).

A BIM is a shared knowledge resource for information about a facility that spans its entire lifecycle; defined as existing from earliest conception to demolition. The current use of BIM is almost entirely from conceptual design to construction closeout, but the finished model acts as the basis for operating and maintaining the building as well. A basic premise of BIM is collaboration by different stakeholders at different phases of the life cycle of a facility to insert, extract, update or modify information in the BIM to support and reflect the roles of that stakeholder.

The U. S. National BIM Standard was created to promote the business requirements that BIM and BIM interchanges are based on: (1) a shared digital representation, (2) that the information contained in the model be interoperable (i.e.: allow computer to computer exchanges), (3) the exchange be based on open standards, and (4) the requirements for exchange must be capable of definition in contract language.

One of FIATECH's projects was the development of a vision model for the life cycle of a facility. That model, named the Capital Projects Technology Roadmap (see below), offers an optimistic vision of a smooth, linear process from feasibility study through property management. It resembles the process described by BIM. It also relies entirely on interoperable information exchange.

Full interoperability is hard to envision within the next decade. Yet, with a growing number of firms committing to BIM for project delivery, and key government agencies, like the General Services Administration, mandating BIM, there will be significant pressure on related application software to be interoperable with information modeling. As owners increase the pressure on building systems and integration vendors for open systems, those portions of the industry will likely fall in line. The financial incentives will drive the progress from fragmentation to interoperability, and it is growing daily. BG



AWARDS & CONTRACTS

John Deklewa & Sons was awarded a contract for the Administration Building for the Longview Power Plant in Monongalia County, WV. The $3 million project is part of the $1.3 billion power plant under construction. Kvaerner is the engineer.

Deklewa was the successful contractor on a $1.2 million renovation and MRI replacement at UMPC Presbyterian Hospital in Oakland. Burt Hill is the architect.

Allegheny County Airport Authority awarded a contract to Nello Construction for general construction on the North Baggage Handling System In-Line EDS project. The work is part of a $14 million renovation, including $10 million in new equipment.

Dick Corp. was the successful contractor on the Jefferson Regional Medical Center Courtyard Infill project. The $2.7 million project consists of a three-story, 10,800 square foot infill to be constructed at two courtyards within the existing hospital. The new area will house physical therapy, administrative offices and storage. WTW Architects is the architect.

Jendoco Construction Corporation was the successful contractor on Duquesne University's Energy Center Chiller Expansion The $542,000 project involves 7,900 sq. ft. of expansion. The design team included WTW Architects and Barber and Hoffman, Inc.

Jendoco was selected by Carnegie Mellon University for renovations of 962 sq. ft. of existing space at Hunt Library and Wean Hall Engineering and Science Library and converting them to three new study rooms. Lami-Grubb Architects designed the $179,000 project. Jendoco was also awarded the renovations to CMU's Baker Hall Room 150. The architect is Burt Hill.

The Green Building Alliance has chosen Jendoco Construction to renovate 3,855 square feet of space in the Riverwalk Corporate Center in South Side. The project will be built to seek LEED Platinum certification and is being designed by Landmarks Design Associates and CJL Engineering, with Moshier Studio as LEED advisor. Ferry Electric and Ruthrauff Sauer will be the electrical and mechanical contractors.

Massaro Corporation was recently awarded a $300,000 contract for the Blackbirds Lofts fit out of Gray Box Theatres. The designer is Studio-D. Work is under way on a $3.5 million contract for phase IIb at Oakland Catholic. The architect is Celli-Flynn Brennan Architects and Planners. Additionally, Guggenheim Partners has hired Massaro for a $273,000 renovation of their Pittsburgh offices. L. Robert Kimball& Associates is the architect. Duquesne University has awarded Massaro a $218,000 contract for replacement of its Student Union ceiling.

Massaro Corporation was the successful contractor for $14 million Center for the Arts at Seton Hill College in Greensburg. MacLachlan Cornelius & Filoni are the architects for the 73,000 square foot building.

Employees, both current and retired, gathered on June 13 to break ground on Massaro Corporation's office expansion. The expansion involves a 8,138 sq. ft. building addition and new 40-space parking lot. The celebration also coincided with Massaro's celebration of 40 years of business.

Fuellgraf Electric Company was selected by the bonding company in July to complete the Electrical Contract on the Peters Township Middle School addition. The project involves the renovation and a new addition to the existing facilities. Technical Management Associates (TMA), one of the Fuellgraf companies, has recently completed classroom additions on seven buildings for the Lee County School District, Ft. Myers, Florida. The $4.5 million, six month contract included the addition of 127 classrooms at 5 elementary schools located in Fort Myers and Cape Coral. TMA has also been awarded a $4.5 million Electrical Contract for the Venetian, a new 435-unit condominium development in Ft Myers. The project consists of 10 buildings and a fully appointed clubhouse.

A. Martini & Co. was awarded a $2 million contract to renovate 22,000 sq. ft. for Life Care Pittsburgh. The project involves new fit-out of offices, senior-assisted activity and health care spaces. Deepak Wadhwani of Renaissance 3 Architects is the architect.

Martini was the successful contractor for the Jewish Community Center's new locker room and fitness activity spaces in Squirrel Hill. The $2.5 million project was designed by Alan Dunn. St. Thomas 'A Becket parish and the Diocese Of Pittsburgh selected A. Martini & Co. for the construction of a new, 800-seat church in Jefferson Hills. John Francona is the architect for Astorino on the $5 million project. Martini is doing $1.3 million renovations to the sanctuary of the St. Bede Roman Catholic Church in Pittsburgh.

P. J. Dick Inc. is providing general construction for the Charles Schwab Build-out/Fit-Up. This contract is for the commercial construction of offices within an existing office space in downtown Pittsburgh. The architect for the project is Robert Stoll with FRCH Design Worldwide.

Walnut Capital has hired P. J. Dick to provide CM services for the Bakery Square project in East Liberty. The former Nabisco bakery and its site will be transformed into an urban retail, office, and hotel complex. Demolition has started and the project will fully commence in early 2008.

The University of Pittsburgh selected P. J. Dick to perform CM-at risk services for the Benedum Hall Laboratories, floors 11 and 12. The University, in conjunction with Pennsylvania's Department of General Services, has also engaged P. J. Dick to provide CM services for the Benedum Hall renovations.

P. J. Dick's Small Projects Group is currently working on the MacMillan Substation on the main campus of Penn State University. This new electrical building consists of cast in place concrete vault/foundation with a precast structure placed on top. The contract also includes site work and utilities.

Burchick Construction has gotten underway on the new $5.5 million Medical Office Building at Ohio Valley General Hospital in Kennedy Township. Burt Hill is the architect on the 25,000 square foot facility.

Burchick was the successful contractor on the $7 million Administrative Office Building phase of the new Children's Hospital. The UPMC project involves renovations to 73,000 square feet of space. Astorino is the architect and Dick Corp. is the construction manager.

PNC Financial Services awarded contracts to Poerio Inc. for two separate renovations projects. Poerio is renovating 14,000 square feet on the 19th floor of Two PNC Plaza in downtown. Poerio was the successful contractor for renovations to the Baum Boulevard branch for PNC in East Side. RSH Architects designed the project.

University of Pittsburgh awarded a contract to Allegheny Construction Group for the latest phase of renovations to the Barco Law Library. The $250,000 project was designed by Glance & Associates.

Volpatt Construction was awarded a contract for the construction of a new Men's Dormitory at Waynesburg College. The $8.6 million project involves construction of a 47,000 square foot, 142-bed facility by August 2008. Valentour English Bodnar & Howell are the architects.

Landau Building Co. has gotten underway on the site work for the Warrendale Village, located in Marshall Township at the intersection of Warrendale-Bakerstown Road and Route 19/Interstate 79. The $15 million mixed-use development is being designed by JSA Architects, and is developed by RAR Development. BG

FACES & NEW PLACES

Charles Parker has been appointed to the position of Co-Chairman for the AIA-MBA Joint Committee. Mr. Parker is Senior Associate at Burt Hill, an architectural firm that meets the business needs of clients in the higher education, sciences, healthcare, corporate, and commercial sectors.

Chartered in 1965, the AIA-MBA Joint Committee consists of ten architects and ten contractors representing the American Institute of Architects Pittsburgh Chapter and the Master Builders' Association of Western PA, respectively. The AIA-MBA Joint Committee provides a unique forum that promotes the exchange of ideas between architects and contractors; these activities have advanced the cooperative working relationship enjoyed by both associations. For more information on the AIA-MBA Joint Committee, please call 412-922-3912 or visit www.mbawpa.org.

The following individuals from MBA-member firms have been appointed to serve on an AGC of America committee: Walter Czekaj, P.J. Dick Inc.; Joseph Franceshini, P.J. Dick Inc.; Kevin Gierc, Dick Corp; Carl Heinlein, American Contractors Insurance Group; Bernard Kobosky, P.J. Dick Inc.; Cynthia Latsko, Mobile Medical Corp; Kenneth Lee, Tucker Arensberg P.C.; Dale Lostetter, P.J. Dick Inc.; John Prim, Construction Insurance Consultants, Inc.; Richard Thomas, Pepper Hamilton; Jeff Thorla, P.J. Dick Inc.; and Eric Wallace, Carbis Walker LLP.

The Gateway Engineers, Inc., based in Pittsburgh, is pleased to announce the recent addition of Engineering Mechanics, Inc. (EMI). EMI has been a leading geotechnical engineering firm in southwestern Pennsylvania for over 40 years, providing comprehensive soil and foundation engineering and geotechnical consulting services. Bringing these complementary capabilities into the company will further extend Gateway's ability to serve all our client's project needs.

Dick Corporation has named Joseph Zukowski Vice President Business Development. Joe has an extensive record with Dick Corporation and has worked on assignments in Estimating, Operations, and Pre-Construction. Joe began his career in 1989 as a Project Estimator, quickly moving into operations as a Project Engineer and Project Manager. Joe has been deeply involved in the success and growth of Dick Corporation's expansion into the developer role, specifically the Enhanced Use Lease (EUL) programs of the Army and Air Force where Dick has been awarded three EUL projects with construction values of over $600 million. In his new role, Joe will continue to be responsible for the development and pre-construction of the EUL opportunities, as well other public/private partnerships involving other government agencies such as GSA and NASA.

Massaro Corporation welcomed project engineer Renee Patronis. Renee joined Massaro on July 2nd and is currently working on the Antonian Hall project at Franciscan University of Steubenville and the Gray Box Theatre project at Blackbirds Loft.

Ron Cortes joined the Mascaro Construction team as a project manager. Ron has Bachelor's degree in civil engineer, is a LEED accredited professional, and has 13 years estimating and project management experience Bill Charles, Jr. joined the Mascaro Construction team as a project engineer on the Marshall University project. Bill is a recent graduate of the Pennsylvania State University, with a Bachelor's degree in civil engineering. Jason Sheffield joined Mascaro as a scheduler. Prior to joining Mascaro, Jason was a civil engineer with the U.S. Army Corps of Engineers. He received his

civil engineering degree from the Pennsylvania State University. Jennifer Surrena is the site secretary at the Stryker project (Erie Readiness Center & OMS) in Cambridge Springs.

Civil & Environmental Consultants, Inc. announced that Zack Coy, E.I.T. and Adam Wenger, E.I.T. have become LEED accredited professionals. Eric P. Wallace, Partner with Carbis Walker LLP has been elected 2007-2008 President-Elect of the Pennsylvania Institute of Certified Public Accountants (PICPA). Wallace heads Carbis Walker's Construction & Real Estate Services niche, and is past chair of the PICPA Accounting & Auditing Procedures Committee.

P. J. Dick, Inc. welcomes three new employees to its operations in the Pittsburgh area: George Matthew, Assistant Project Manager, Dayne Jefferson, Project Manager, and Annabelle Macalister, Assistant Business Development Manager.

Pepper Hamilton LLP announces the completion of the remodeling of the 49th floor of One Mellon Bank Center downtown. Since the Pittsburgh office of Pepper Hamilton opened its doors in 1995 the office has grown from 7 to 52 attorneys and more than 70 support staff. The office expanded from 20,804 sq. ft. of the 50th floor of One Mellon Bank Center to now occupy three floors and more than 62,000 sq. ft. Contractor for the project was TEDCO Construction and the designer was Oliver Design Group.

Joseph H. Bucci has joined Houston Harbaugh as a Director in the Litigation Department. Joe concentrates his practice in the areas of construction, surety, government contract law, and real estate development. Joe graduated, cum laude, from The University of Pittsburgh, and he received his law degree from Duquesne University. Prior to becoming an attorney, Joe was employed in the construction industry for more than 15 years as a Steamfitter and then as a Project Engineer with Mellon-Stuart Company. BG

The Industry in the Community

Dwight White with Ed Friel, RTP Board President and Vicki Johnson, RTP Administrator.

CLO performers at the Club Noir.

Enjoying the evening at Club Noir are (left-to-right) Gina Chappie, Anthony P. Chappie, Suzanne Labriola, Andrew Perez, and Mimi Perez.

Club Noir

Rebuilding Together Pittsburgh (RTP) hosted its third fundraising event on July 13, 2007 at Heinz Field. Presenting Sponsors for North Shore Club Noir included Meyer, Unkovic & Scott LLP, Thorp Reed & Armstrong, LLP and Reed Smith LLP. Master of Ceremonies Sponsor was Master Builders' Association with the Master of Illusion Sponsor, Schneider Downs & Co., Inc. The evening provided more than 400 guests with good food, fun, gaming, entertainment, live and silent auctions while also supporting the cause of RTP. When the night was over, about $40,000 was raised to support RTP's year round program Operation Urgent Care. This program provides free emergency home repair services throughout the year including plumbing, electrical, roofing repairs, and home modifications.

Mascaro Construction Sponsors the North Shore Corporate Walk for Cystic Fibrosis

On May 10, 2007, Mascaro sponsored the North Shore Corporate Walk for Cystic Fibrosis and over 50 Mascaro walkers participated. Through the generous donations of Mascaro and its employees, we raised over $12,500 for this worthwhile charity.

The Mascaro Construction team assembles for the North Shore Corporate Walk.

Golf Outings

On August 6 the Master Builders' Association of Western PA held their annual membership outing at the Pittsburgh Field Club in Fox Chapel. Battling temperatures and humidity in the high 80's, 144 golfers scraped the ball around the lush Field Club layout.

On August 13, John Deklewa & Sons hosted the 8th annual golf outing to raise funds for the Beaver County YMCA programs at St. Jude Country Club in Chicora. The proceeds help to support the YMCA's summer programs, one of which serve over 14,000 meals to children who normally receive meal assistance during the school year. The 'Y' also operates summer programs for over 10,000 children on 20 different playgrounds throughout Beaver County. The Beaver County YMCA opened its new facility in 2000, and has expanded twice since.

On Monday July 30, 2007 the Engineering Society of Western Pennsylvania (ESWP) held its Annual Golf Outing. More than 150 players were on the course at the Pittsburgh Field Club for the afternoon of golf, followed by dinner and awards. BG

Tom Milletary, of Easley & Rivers, David McKamish, of McKamish Inc., Ken Marino, of Wayne Crouse Inc., and Andy Beamon, of Mascaro Construction, enjoy the evening at the Field Club.

Outing hosts John E. Deklewa and Bill Parise, Executive Director of the Beaver County YMCA.

Golfers Jim Bly of Marsh USA (l) and Tom Beatty of ACA Engineering (r) enjoy the day at St. Jude.

ESWP President Alex Sciulli, P.E., (Mellon Financial Corporation) with Pittsburgh Post-Gazette Golf Writer Gerry Dulac, who was Guest Speaker at the Awards Dinner.

The winning team in the Engineers' Society of Western Pennsylvania Annual Texas Scramble was from U.S. Steel, and represented by (L) Steve Foster, Jamie Pavarnik, Bill Wolfe and Tony Nuzzo.

Anthony Martini, A. Martini & Co., Ted Pettko, of Schneider Downs, Jack Ramage, Exec. Director of the MBA, and Matt Jameson, of Babst Calland Clements & Zomnir.

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.

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Closing Out

The Effect of Technology Industries on the Southwestern Pennsylvania Economy

Kevin Lane
Director of Public Relations
Pittsburgh Technology Council

Technology industries in the 13-county southwestern Pennsylvania region are aligned in clusters, which essentially are groups of like industries that share common deep labor and management pools, training resources, supplier networks and best practices.

In the Pittsburgh region, there are five measurable technology industry clusters that are tracked each year by the Pittsburgh Technology Council. They are:

1) information technology (which includes the region's hardware, software and telecommunications businesses)

2) life sciences (which includes producers of medical and surgical devices, medical and lab equipment makers, biological research labs and institutions, pharmaceutical companies and health service providers)

3) advanced manufacturing (companies that use a high degree of automated processes and information technology)

4) advanced materials (such as those produced by chemical and plastic makers)

5) environmental technology (as exemplified by the region's waste remediation companies, environmental equipment makers and professional service providers)

Technology industries are important to the Pittsburgh region for many reasons. A disproportionate share of high-growth, innovative businesses emerge from technology industries, and despite economic downturns in geographic markets and other industry sectors, technology industries are growing globally and are forecast for continued growth with new and expanding markets. Technology industries create a greater share of high-paying, high-quality jobs, and on average, technology industries generate higher added value per worker than other non-technology industries. Technology industries also create products that are prime export commodities, thereby bringing new wealth into the region.

In addition, as high-tech industries grow and develop, a supplier network or infrastructure also forms along with it, including:

- Construction and building trades
- Finance, accounting and auditing
- Marketing
- Legal
- Engineering and testing
- Management consulting
- Telecommunications
- Air transportation, hospitality and travel-related services
- Electric power and other utilities

Technology industries pull the rest of the economy along with it. Ross DeVol, director of regional economics at the Milken Institute, discovered that a technology growth rate of five percentage points above the U.S. average equals one percentage point advantage in total real output growth. Therefore, achievement in high-tech industries is critical for overall economic growth in metropolitan areas.

This finding is confirmed when one looks at the Pittsburgh region's technology picture from 20,000 feet. The most recent statistics from the Pittsburgh Technology Council's annual State of the Industry Report show that there are 7,272 technology firms tallied in the year 2005 (the latest year for which complete data is available.) This represents more than 10.8 percent of all companies in the region. However, these firms employ more than 207,000 individuals and account for 17.5 percent of the area's overall workforce. Beyond that, the $10.8 billion earned last year by the technology workforce represents 24.2 percent of the region's total annual payroll.

So one can see that, since 11 percent of the region's employers pay 24 percent of the region's wages, we might want to pay closer attention to nurturing and helping these types of companies to grow.

Massaro

respectfully thanks
all participants who
have seamlessly worked
together to erect the
superstructure of
the Grant Street
Transportation Center.

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H2M1

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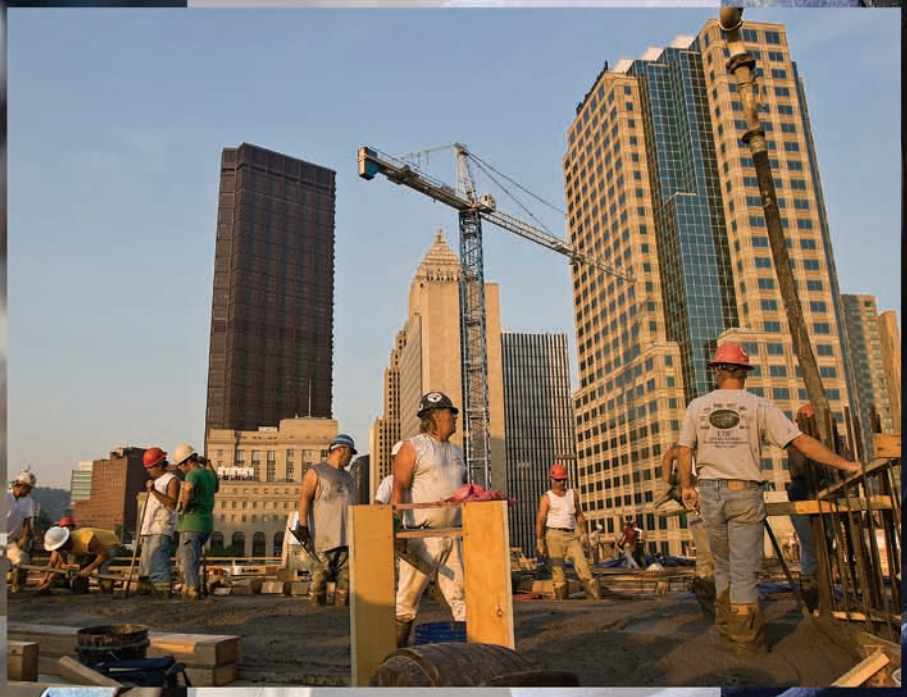

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For more information, contact David Panneton at 1-412-762-7278 or david.panneton@pnc.com.

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