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THE MAGAZINE OF THE MASTER BUILDERS' ASSOCIATION OF WESTERN PENNSYLVANIA

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What to Expect from
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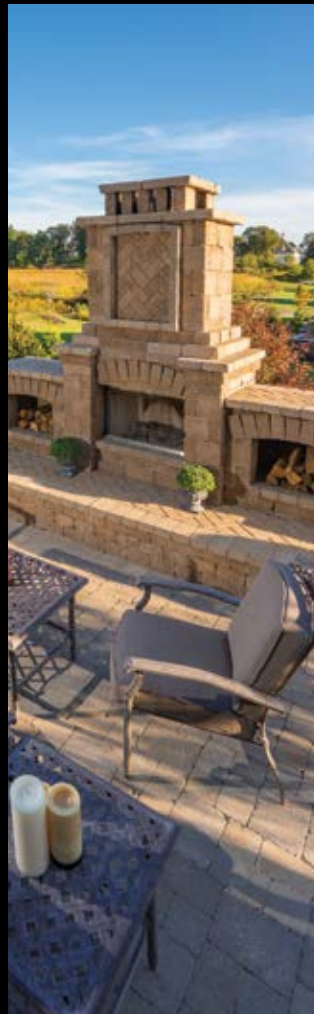
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PUBLISHER
Tall Timber Group
www.talltimbergroup.com

EDITOR
Jeff Burd
412-366-1857
jburd@talltimbergroup.com

PRODUCTION
Carson Publishing, Inc.
Kevin J. Gordon

ART DIRECTOR/GRAPHIC DESIGN
Carson Publishing, Inc.
Jaimee D. Greenawalt

CONTRIBUTING EDITORS
Anna Burd

CONTRIBUTING PHOTOGRAPHY
Tall Timber Group
Master Builders' Association
of Western PA

ADVERTISING DIRECTOR
Karen Kukish
412-837-6971
kkukish@talltimbergroup.com

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Carnegie Mellon's
Scott Hall.



07	REGIONAL MARKET	58	MANAGEMENT PERSPECTIVE What to Expect from the Shell Cracker
13	NATIONAL MARKET	61	MBE/WBE SPOTLIGHT Imbue Technologies
17	MARKET METRICS	64	BEST PRACTICE Marketing in Slow Sectors
19	WHAT'S IT COST?	67	TREND TO WATCH Student Housing Update
20	FEATURE Higher Education in Transition	71	INDUSTRY & COMMUNITY NEWS
34	PROJECT PROFILE Carnegie Mellon's Scott Hall	76	AWARDS
49	FIRM PROFILE Casework Installation Company LLC	82	FACES & PLACES
53	FINANCIAL PERSPECTIVE Protecting Against Profit Fade	84	CLOSING OUT Quintin Bullock President, Community College of Allegheny County
56	LEGAL PERSPECTIVE Implied Warranties as to Plans and Specs on a CM At-Risk Project		



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Publisher's Note

I have an old friend named Roger Carothers who was in charge of construction (among other things) at LaRoche College and, later, Grove City College. We met in 1991 and a few years later we had some interesting discussions about the future of colleges and facilities. The spark of the conversation was the Pacem in Terris program initiated by Monsignor Kerr of LaRoche in 1993. Msgr. Kerr has a vision of making LaRoche a global education center, offering sanctuary for students from around the world. The program was intended to enhance peace and bring LaRoche a higher profile internationally.

The practical issues involved in such an ambitious program included changes to the campus' physical plant. LaRoche expected Pacem in Terris to boost enrollment and to spur new educational offerings. That would mean more space and a significant capital investment. It could also mean more tuition, grants and gifts. My friend Roger wasn't paid to think about the impact of more funds; he was paid to worry about where to put all the students and how to pay for that. And Roger was good at worrying.

Sometime in the mid-1990s, we had a discussion about why all this change was so worrisome to him. Roger was concerned that costs for education were going up at an unsustainable rate and that technology was creating an unpredictable environment. He thought that the pace of technological change made keeping up very difficult but he was especially worried that the college of the future would have such different physical surroundings – or none at all – that it made planning for facilities very risky. He often referred to 2017 as a watershed year when birth rates were predicting a decline in enrollment for college students. Roger felt certain that there would be colleges that simply couldn't remain solvent and he worried that LaRoche could be one of them if things didn't go well.

As I say, Roger was paid to worry and he was good at it. He was also pretty prescient. None of the individual concerns he had has become manifest to the degree Roger feared; however, all of those things – and a few others – are part of what haunts higher education at the moment.

We know that LaRoche did not succumb to the changing landscape, although the Pacem program went on hiatus (the final students from the original program graduated in 2009). Since the time that Roger expressed his concerns, LaRoche has also spent quite a bit less on expanding its facilities. Over the past 20 years, however, the same cannot be said for most institutions of higher education. Now that we can look back at the early 2000s with the wisdom of hindsight, it seems as though colleges and universities were engaged in a combination of the arms race and the debt bubble. Being on the wrong end of either of those was a bad thing.

When the whole economy is taking on debt, often under the guise of investing for growth, it's easy to understand why boards of trustees for colleges would consider doing the same to build facilities that would attract more students. If that strategy worked out, the loans or bonds would be easily paid back by the additional tuition revenue of the future; and with so many Americans willing to re-mortgage their homes to pay ever-higher tuition rates, those future revenues could be even higher than expected.

The arms race theory was just the flip side of the growth scenario: if Your College didn't build the slickest new dorms or student activity center, then Their College would win the recruiting battle. Your College would be left with declining enrollments or falling SAT averages and crappy old buildings.

Of course, those competitive strategies didn't seem to account for what would happen if every college built attractive new buildings. In the end, Your College would be stuck differentiating itself from Their College on other strengths, strengths that were probably there without the new facilities.

What higher ed is experiencing now is something of a hang-over from the excesses of the last 20 years. Virtually every college or university had buildings that needed to be replaced or updated so the building boom wasn't all bad. The new reality of higher education in a post-Great Recession world isn't all that bad either. It's clearer now that a traditional four-year college may not be necessary for every student. There are growing needs for students to learn technical skills after high school, instead of getting a liberal arts degree. Household income didn't grow nearly as fast as tuition and fewer parents are going into debt to send their kids to college.

Some common sense has crept into how colleges and universities are thinking about their strategies. You can see that in how facility planning is going. There is more thinking about facilities in terms of the institutional priorities. Trustees are asking questions about justification for capital spending and the answers have to be better than "the college down the road is doing it."

The pause in activity will inevitably lead to more construction that revamps the physical plants that already exist. Many of the changes that Roger Carothers worried about are still creating demand for newer facilities. And of course, the first college freshmen born to the Millennial generation should start moving into dormitories in the fall of 2030. If those kids are anything like their parents, that should create a tsunami of change all over again.



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REGIONAL MARKET UPDATE

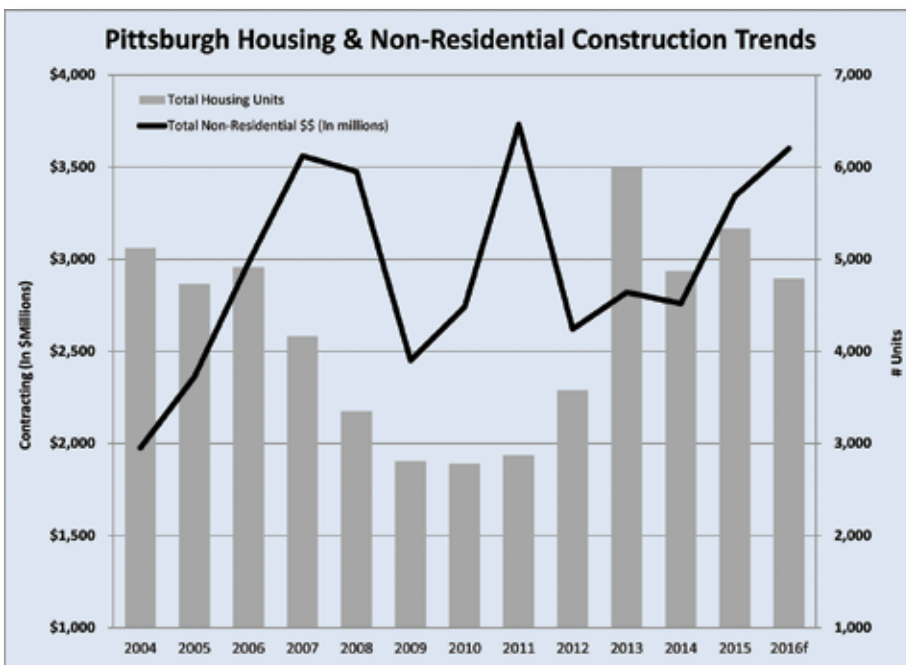


Uncertainty. On June 7, Royal Dutch Shell removed the uncertainty surrounding the construction of its ethylene/polyethylene manufacturing facilities in Beaver County when it announced the final investment decision had been approved for the ethane cracker in Monaca. For the regional economy and for the natural gas downstream industries, the announcement is a catalyst for the development of a supply chain and customer base for the 1.6 million ton annual output potential of the plant. Moreover, the announcement gives certainty to Thai chemical company PTT about its decision to build a second cracker 30 miles southwest of Monaca in Belmont County, OH.

Shell's announcement – which was no surprise to the construction firms working on site for the past 18 months – provides labor organizations with certainty of employment so that recruitment and training can ramp up to meet the demands of the cracker project. The project will also be a high-profile beacon that attracts skilled workers from other parts of the country to Western PA, which will fill the void between the workforce needed and the capacity of labor to train enough workers.

At the same time, the final investment decision exaggerated a different kind of uncertainty for Pittsburgh area construction firms. Shell's plant, and the economic potential that accompanies its operation, has been hanging over the region as potential for four years now. The regional construction market has become much more vibrant in that time but not to the extent that all companies have shared in the prosperity. As the cracker project heats up over the next few years, it will be a labor-eating machine but few can predict with any certainty when the construction that will follow in its wake will occur. For local specialty contractors especially, the project looms as a threat to workforce without the certainty of related opportunities.

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A mixed blessing is still a blessing in the final analysis, but the decision to invest by Shell will make the market more difficult to manage. Contractors, designers and real estate owners and users will face additional challenges while the project is under construction.

The looming feedstock needs of the steam cracker or crackers that will be operating at the beginning of the next decade is a blessing for the natural gas industry, which has struggled with low prices and excess capacity. Through the middle of 2016, gas market conditions have improved only negligibly and capital expenditures have

been cut further. Gas companies have also seen a slowdown in midstream activity due to a tougher regulatory environment, in addition to unfavorable market pressures. Some recent slowdowns are:

- Legal wrangling over properties and delays in permitting have pushed back the in-service date for the second Mariner East pipeline to carry natural gas liquids from Southwestern PA to a terminal south of Philadelphia. Mariner II is expected to come online in early 2017.
- Kinder Morgan suspended its plan for its 400-mile Northeast Direct pipeline into New England because it could not find enough customers or appropriate regulations to help pay for it.
- New York's Department of Environmental Conservation rejected necessary permits for the Constitution Pipeline, which will deliver Marcellus gas to New York.
- Spectra Energy announced that the PennEast Pipeline into New Jersey will not come online until the second half of 2018, a delay of almost a year that the company attributes to slower-than-expected review by the Federal Energy Regulatory Commission.

Opposition from environmental groups has increased and efforts to slow pipeline development were given a boost from the April 29 explosion at a Texas Eastern pipeline in Salem Township. Political pressure to delay permits and legal action against the DEP is likely to continue through 2016, which will depress drilling activity into next year. Analysts see one upside from the current market turmoil, however, as reduced drilling will erode gas inventories and lift prices somewhat in 2017.

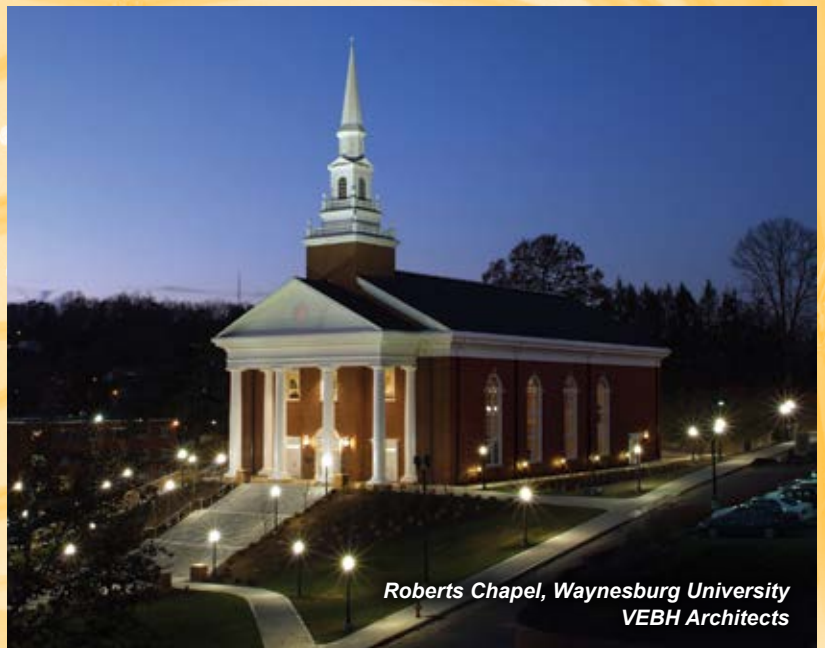
Another segment of the market that received unwelcome news was the hospitality sector. The number of hotel projects built in Pittsburgh during the past five years far exceeded the historic average. In part this was due to increased leisure activity in the region but the primary driver was the booming demand driven by the natural gas business. Throughout the hotel ramp up, metrics in Pittsburgh continued to improve, even as more beds were brought online. During the first quarter of 2016, however, the key metrics plummeted.

STR Inc. (formerly Smith Travel Research) reported that revenue per available room (REVPAR) declined by 16 percent during the first quarter. Observers of the hotel market hope that the decline is a temporary blip associated with



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the opening of several hotels that are still in the ramp up stage. Occupancy in Pittsburgh rose to 66 percent in 2015 so a continued decline in REVPAR beyond the first quarter would suggest that rates or occupancy have begun to slip.

In the short term, the perception of a softening market could slow development of projects in the pipeline or make financing more complicated. There are plans for full service or boutique hotels in Downtown, North Shore, South Side and Oakland, as well as a number of business hotels proposed or under construction in Cranberry and Beaver County.

After a slow start to the year, construction of apartments has picked up. Milhaus Development moved ahead with the \$40 million first phase of its Arsenal Terminal Site project. Bids have been taken on the 300-unit South Hills Village Apartments. In Oakland, Massaro Corporation is expected to start work soon on the 326-unit Empire apartments and is working with Campus Advantage on its 138-unit, 290-bed apartment building at 3407 Forbes Avenue. Absorption of new multi-family units in the region had slowed during the first quarter but the apartment market, especially the suburban market, should be one of the sectors that sees a boost from Shell's green light in Monaca.

Employment news in Pittsburgh maintained the trend of modest job growth and growing unemployment. The total number of people employed in the seven-county metropolitan statistical area in April reached a new all-time high of 1,165,000; however, additions to the labor force outpaced the job creation year-over-year, with 8,600 more people in the workforce. That boosted unemployment 30 basis points to 5.8 percent in April compared to March. Unemployment was up slightly more from the 5.4 percent of April 2015.

For the additional 6,400 more people who were unemployed in April 2016, the jump in rate isn't good news but from the perspective of the regional economy, the silver lining is that the labor force is expanding. Demographic support for the Western PA workforce is fading each year, so an increase in the labor force is imperative for the future health of the regional economy. Job creation has to increase accordingly, however, or the higher unemployment rate will be a disincentive for others to actively look for work or relocate to Pittsburgh.

The housing market in Pittsburgh remains healthy, especially for existing homeowners, but sluggish from a new construction perspective. Pittsburgh Homebuilding

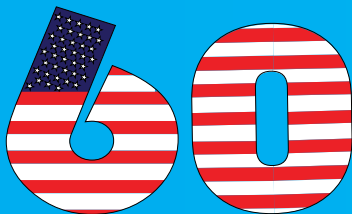
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During the next few years there should be demand from contractors and suppliers working on the Monaca project for storage and lay down space. It's also anticipated that demand will come from companies that will be in the Shell plant's supply chain, much like the Westinghouse relocation spurred activity in Cranberry eight years ago.

Report's permit research and estimate shows 959 single-family dwellings and 923 units of apartments and attached dwellings were permitted from January through June of 2016. There were 1,881 total units started, compared with 2,390 started from January through June of 2015, a 21.3 percent decline. Growing lot inventory and improved demand pushed construction of single-family detached homes 7.4 percent higher than during the same period in 2015. Inventory of existing homes for sale continued to hold steady or decline slightly, which is not good news for residential realtors. The lack of inventory is helping to push the price of homes up by more than five percent.

The source of the decline in overall residential construction is fewer apartment starts. There were 426 units of new apartments started from January 1 to June 30, compared to 1,107 apartment units started during the first six months of 2015. Although lenders and developers in the Pittsburgh market have begun voicing caution about the multi-family market, there are still more than 4,500 units in planning and, given the projects that have bid recently, it is almost certain that more than 1,500 units will be started by year's end.

Bolstered by industrial and power plant projects, construction surged to \$2.28 billion during the first six months of 2016. That figure was boosted significantly by the start of Tenaska Energy's 925-MW combined cycle power plant in South Huntingdon Township, but the \$1.7 billion in starts aside from the Tenaska project represents a stronger-than-normal level of construction.

Based on the bidding activity through six months, the outlook for the remainder of 2016 was for lower contracting volume than normal. School construction – driven by a half dozen large projects – has been an unexpected contributor to the activity thus far in 2016 but the nature of the school building cycle is such that most of the action in K-12 is done for the year. Commercial real estate, which has been a bright spot for construction over the past few years, was beginning to feel the effects of the uncertainty creeping into the economic outlook; however, it is the commercial sector that may see the first impact of the Shell cracker investment decision.


Within 24 hours of the announcement by Shell, real estate brokers were reporting a significant uptick in interest. Since the 2012 site selection announcement, many companies from outside the region had been scouting locations in Western PA but few had committed to new projects or leases. Developers of office and industrial space have been bullish, especially since low interest rates have made the cost of capital much cheaper and allowed more time for new buildings to stabilize. If the interest shown since the Shell announcement translates into deals, the activity will be a real boost to commercial real estate and should spur more speculative projects, which had begun to slow.

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Those with property in close or convenient proximity to the I-376 corridor in or near Beaver County should benefit most. That includes Chapman's Westport, Imperial Land's Findlay Industrial Park and Westport Woods, Continental/Chaska's Pittsburgh International Business Park, Burns & Scalo's "Boardwalk" and Cedar Ridge projects, Findlay Crossing and the properties owned by Beaver County Corporation for Economic Development and C. J. Betters Enterprises.

Betters has already seen an impact, as Shell is leasing land for storage and a 200,000 square foot build-to-suit warehouse developed. As far as speculative development goes, the impact will depend on the individual developer.

Jim Scalo, whose company has developed more than 600,000 square feet of spec office in the past three years, admitted that he had seen some uncertainty creep into the market recently. Shell's announcement has boosted his plans.

"We are increasing development plans," he says. "I love spec. Tell me a business that isn't spec. You must believe in your product, your market and the execution of your organization." 



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NATIONAL MARKET UPDATE

As the presidential political season approaches its climactic months, there is growing evidence that the U.S. economy is functioning far better than the headlines. At its foundations, however, the economy is showing cracks. Businesses have slowed the pace of hiring. Corporate earnings continue to decline. Uncertainty about the coming year, perhaps magnified by election rhetoric, seems to be dampening business investment. At the same time the underpinning of the economy, the U.S. consumer, seems to be clearly split about the health of his or her own household finances compared to those of the nation.

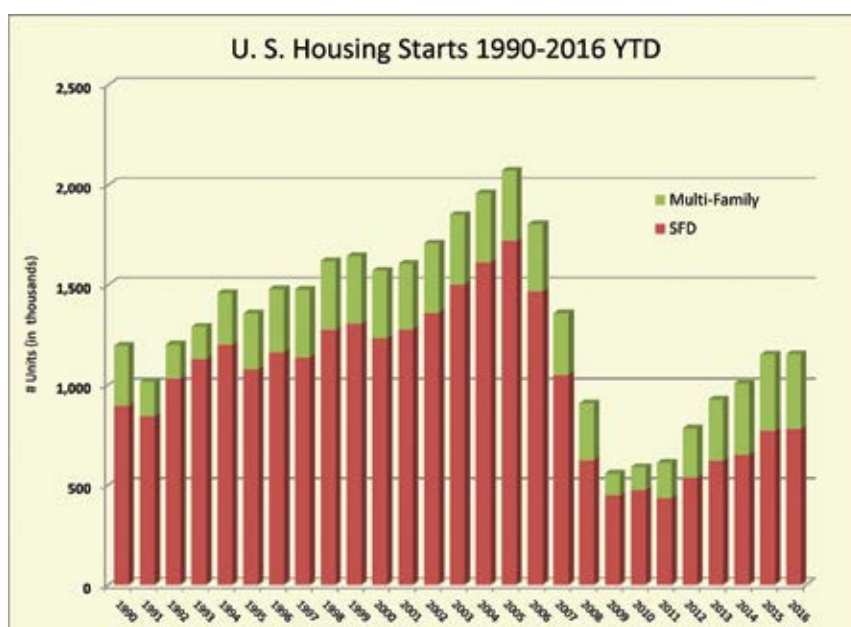
A survey by the Associated Press/NORC Center for Public Affairs Research showed that 42 percent of Americans felt the U.S. economy was in good health, while 66 percent judged their own financial condition to be strong. Behind the responses were concerns about another financial downturn, stock market volatility and especially the negative sentiments of the political trail. Only one in three respondents expressed confidence that they could quickly find employment in the event of a layoff.

The evidence of the dampening influence of the political rhetoric showed up in the disparity of responses of Democrats and Republicans. Among those identifying themselves as Republicans, only 34 percent described the economy as good, compared to 54 percent of the Democrats. The outlook was even more divided, with 38 percent of Republicans expecting the economy to deteriorate in 2016 compared to only 18 percent of Democrats.

Similar divergences existed in May between sentiment and data. Consumer confidence, as measured by the University of Michigan/Reuters and Conference Board surveys, has been in a slightly downward trend since the first quarter of 2015, yet consumer spending continues its multi-year pattern of outstripping gross domestic product (GDP). April's retail spending jumped 1.9 percent and forecasts for the full year spending growth remain at or above four percent, even though GDP estimates for 2016 have been moderated to two percent.

Hiring had also been disconnected from sentiment until late spring. Surveys of business owners find that plans for investment have fallen off for 2016, including capital spending. Yet

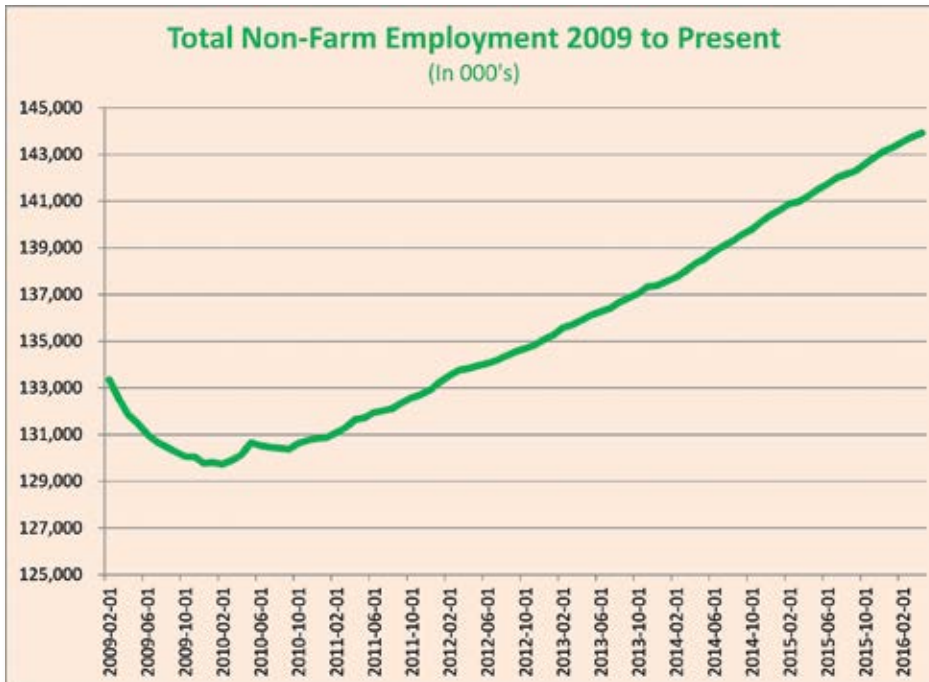
the pace of hiring remained brisk for a business cycle that is now in its seventh year of growth. May's lack of job creation – employers added only 38,000 to the payrolls – was a warning sign that expansion is coming to an end, although other data reinforced the strength of the labor market. Jobless claims fell to 268,000 in late May. Even at the granular level the data is debunking myths about the health of the labor market. For example, unemployment among college grads is only 2.4 percent, compared to 5.9 percent of those with no more education than a high school diploma. The Labor Department's data is at odds with the popular narrative that debt-burdened recent college grads aren't finding jobs.



New home construction continues to recover even as pent-up household formation demand builds.

What is clear thus far in 2016 is that the behavior of individual businesses and consumers betrays an optimism that is not being expressed in the aggregate. Americans have gotten their finances in order and are spending, even as they express concerns about the near-term economic outlook. Businesses are hiring and investing in construction, even as business owners respond to surveys about the coming year in increasingly negative terms.

It's unusual for sentiment and action to run in opposite directions for very long. As the economy rebounded from the financial crisis, a crisis in confidence kept both consumer and business spending muted right through 2013. With a presidential campaign that is likely to be toxically negative in the summer and fall, and a 24/7 news cycle to cover every word, it's not hard to see faltering confidence turn to inaction.



U.S. employers have added 14 million jobs during the past five years but payroll expansion may be reaching an end.

After a first quarter with 0.5 percent GDP growth, the U.S. economy can't afford to have uncertainty chill activity.

According to the National Income and Product Account profit reports for the first quarter of 2016, earnings for the S&P 500 declined seven percent from the first quarter of 2015. The energy sector led decliners, with a drop of 107 percent year-over-year. Companies in the consumer discretionary sector saw the biggest gains, with an aggregate increase of more than 19 percent.

The slowing profit growth is one likely cause of the slowing wage growth. History has shown that decelerating profits and accelerating employment growth can coexist for an extended period of quarters, although eventually smaller profits will be addressed by reducing payrolls. To the extent slower earnings affects commercial real estate, the current state is likely to keep interest rates from being hiked and inflation

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in check at low levels. Continued weak profit growth does dampen demand for space, however, and the nearly ten percent increase in sublease space available – which bottomed out one quarter ahead of the peak for corporate profits in 2014 – is a reflection of that.

Through the first five months of 2016, however, data on the construction and real estate markets are still strong.

One segment of the economy that continues to show strength is the housing market. The National Association of Home Builders most recent survey again registers confidence from builders. Existing home sales were 5.45 million in April and new home sales were up steeply to 619,000, an increase of 100,000 units over the estimate.

Although the massive overhang of foreclosed homes that followed the mortgage crisis worked off several years ago, the supply of so-called “zombie” foreclosures lingered until recently. These were homes that were in the process of foreclosure but had no occupants. After banks moved too quickly to push homeowners into the foreclosure process, there was an overreaction in the opposite direction, particularly where no one occupied a home with a non-performing mortgage. Since the beginning of 2016, lenders have moved to close the books on these homes, discounting them to sell. The effort has reduced the total number of zombie properties to 19,187 by May 1, with 63 percent of those located in the five states that require court approval for foreclosure.

Inventories of new and existing homes are extremely tight. At the current pace of sales, the inventory of homes in the market would be depleted in 4.7 months. The short supply is reflected in pricing, as median existing home prices were up 6.3 percent year-over-year and new home prices spiked 9.7 percent from April 2015.

All of this good market news was reflected in April's housing start data. Construction of new homes jumped 16.8




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percent year-over-year in April to 778,000 single-family units (seasonally adjusted). In the June 1 U.S. Census Bureau of the Department of Commerce announcement, spending on residential construction fell 1.7 percent from March to April, but the \$445.7 million was 7.7 percent higher than April 2015.

The Census Bureau report showed that construction spending during April 2016 was estimated at a seasonally adjusted annual rate of \$1.134 trillion. The April volume was 1.8 percent below the revised March estimate but 4.5 percent above the volume in April 2015. During the first four months of 2016, construction spending amounted to \$334.8 billion, 8.7 percent more than the same period in 2015.

Spending on private construction was at a seasonally adjusted annual rate of \$843.1 billion, a year-over-year increase of 5.7 percent. The annual rate of public construction spending was \$290.8 billion, a 2.9 percent decline from March and an increase of only 1.2 percent from a year earlier.

U.S. construction markets have thus far followed the playbook that nearly all economists forecasted for 2016. Those predictions were based on GDP growth that was in the range of 2.5 percent. While a strong second quarter could see the growth rate get back on that pace, most economists have moderated expectations for GDP growth to two percent or less.

Data on construction through May reflects demand for roughly six-to-eight percent more space and a similar rate of growth in dwelling units. Activity during the time periods measured thus far reflects decision-making that would have occurred early in the year, before the political situation and global economic picture were as clear. The true test of the strength of demand will come as decisions about expansion are made during the coming months. Should business owners and consumers be feeling more confident than public sentiment surveys are showing, the arc of construction growth should continue its climb at a rate above five percent. A falloff in construction activity during the summer months, however, will confirm the fears that uncertainty is ruling the market again. 



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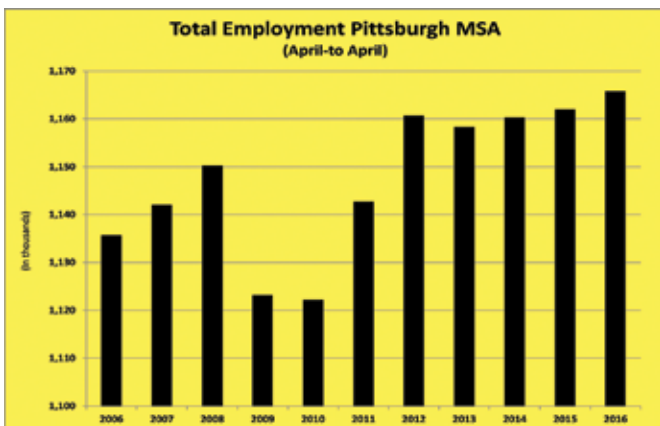
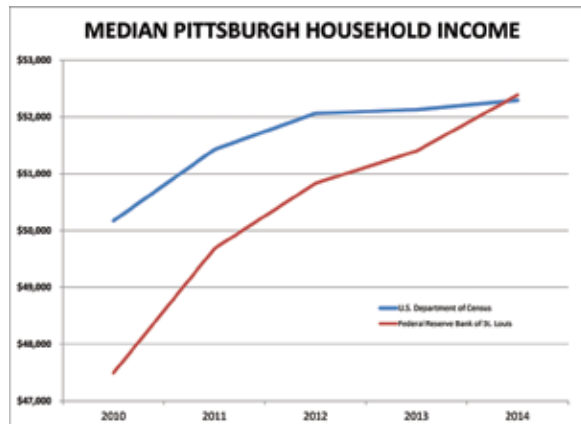
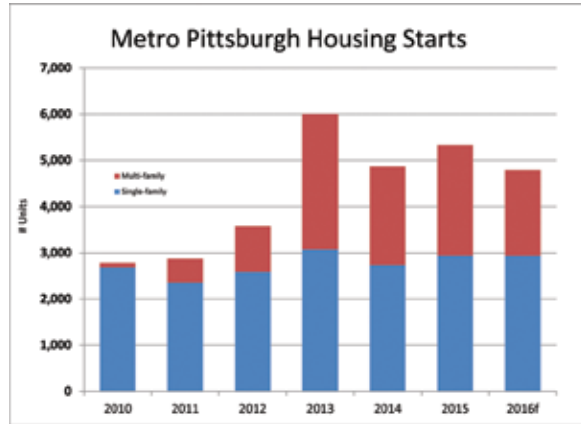
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Market Metrics

BENCHMARK	Jan-June 2015	Jan-June 2016 (f)
Total SFD units	820	959
Total SFA/Multi-unit	1,443	923
Total residential \$\$	\$423.1 million	\$412.1 million
Total non-residential \$\$	\$1.38 billion	\$2.28 billion
K-12 additions/renovations	\$80.5 million	\$251.6 million
Higher Ed construction	\$68.5 million	\$208.4 million
Hospital construction	\$33.1 million	\$83.3 million
Hotel construction	\$38.7 million	\$49.1 million
Industrial construction	\$364.6 million	\$660.9 million
Office construction	\$103.8 million	\$125.2 million



TOP RESIDENTIAL MORTGAGE LENDERS - Pittsburgh 2015			
Rank	Lender Name	Number Mortgages	Market Share
1	WELLS FARGO MORTGAGE INC,	1,653	11.46%
2	HOWARD HANNA FINANCIAL SVS,	1,060	7.28%
3	DOLLAR BANK, FSB,	1,154	5.26%
4	NVR MORTGAGE FINANCE, INC,	448	4.66%
5	FIRST NATIONAL BANK	846	3.59%
6	PNC FINANCIAL,	936	2.99%
7	QUICKEN LOANS,	415	2.62%
8	S&T BANK	678	2.36%
9	RBS CITIZENS BANK,	486	2.22%
10	UNION HOME MORTGAGE CORP	336	2.09%

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WHAT'S IT COST?

After years of relative stability, construction costs have begun to see upward volatility in several key categories. Steel, fuel and labor have all seen prices rise higher than the overall rate of inflation. In the case of steel and fuel, the increases are rebounds from cyclical lows. Given that incidence rate of those basic materials, and the continued short labor supply, construction prices should move higher faster than inflation over the next year.


The most profound change has occurred in the price of steel. From its recent cyclical high of \$750/ton in 2011, steel prices fell steadily to a low of \$472/ton in 2015. The major cause for the rapid decline was the slowing of economic growth in China, while steel manufacturing capacity climbed – again due to China. Although the oversupply of steel still exists, tariffs on low-priced imports have driven prices up as much as 60 percent this year. Efforts by the Chinese government to stimulate the economy have also generated about ten percent more demand for steel rebar and structural shapes. The outlook is for steel prices to continue to increase, although much more slowly, through the end of 2016.

Oil prices have also bounced off lows not seen since the recession. Large-scale reductions in rig counts, especially in shale plays, and production cutbacks in some oil-producing nations have produced a rally in prices of more than 90 percent. For construction, higher oil prices mean more expensive roofing materials, adhesives and sealants, paving materials and fuel. According to the Energy Information Administration's June 6 pricing release, the average price of diesel has jumped by 42 cents since February, to \$2.41 per gallon. Diesel prices are, however, still 50 cents lower per gallon than the same period in 2015.

Prices for products derived from oil are seeing steady monthly hikes. The price of asphalt shingles has increased three to five percent each of the past two months. Polyethylene sheet prices went up five percent in May and an expected four percent increase in resin costs should mean another five percent increase in sheeting in June.

These underlying spikes in basic materials are giving manufacturers and distributors the impetus to hold the line on increases thus far in 2016. With U.S. housing and

commercial construction growing steadily, the odds are that similar price increases will be accepted by the market.

May's producer price index report reflected the strengthening supply and demand fundamentals. According to the June 15 report by the Bureau of Labor Statistics, the producer price index (PPI) for construction prices rose 0.1 percent in May over April and 1.9 percent for the full year. Because of a 26 percent year-over-year drop in energy prices, prices for all materials that go into construction were off 3.4 percent for the year; however, increases in the other key construction components nearly offset the energy price decline. Completed costs for all major building categories were up more than the rate of core inflation, ranging from a 1.2 percent increase in the costs of industrial buildings to a 2.7 percent hike in the cost of warehouses. 

PERCENTAGE CHANGES IN COSTS		May 2016 compared to		
		1 mo.	3 mo.	1 yr.
Consumer, Producer & Construction Prices				
Consumer price index (CPI-U)		4.0	1.3	1.0
Producer price index (PPI) for finished goods		0.3	0.5	(0.1)
PPI for final demand construction		0.1	1.0	1.9
Costs by Construction Types/Subcontractors				
New warehouse construction		0.1	1.2	2.7
New school construction		0.2	0.9	1.9
New office construction		0.2	1.1	2.1
New industrial building construction		(0.4)	0.3	1.2
New health care building construction		0.0	1.0	1.6
Concrete contractors, nonresidential		0.1	1.5	4.4
Roofing contractors, nonresidential		0.1	0.5	1.6
Electrical contractors, nonresidential		0.2	0.3	4.0
Plumbing contractors, nonresidential		0.1	0.9	(0.6)
Construction wages and benefits		N/A	0.1	2.6
Architectural services		(0.3)	1.0	2.3
Costs for Specific Construction Inputs				
#2 diesel fuel		17.6	27.1	(28.5)
Asphalt paving mixtures and blocks		(2.6)	(7.3)	(7.6)
Cement		0.3	3.1	4.7
Concrete products		(0.3)	1.3	3.0
Brick and structural clay tile		0.2	0.3	0.3
Plastic construction products		0.6	0.2	(1.1)
Flat glass		0.5	1.0	7.7
Gypsum products		(1.1)	3.4	2.1
Lumber and plywood		0.9	3.2	0.4
Architectural coatings		0.0	(0.9)	(1.4)
Steel mill products		4.6	7.2	(5.2)
Copper and brass mill shapes		2.0	3.2	(16.0)
Aluminum mill shapes		1.1	0.8	(7.9)
Fabricated structural metal		1.7	3.5	(2.4)
Iron and steel scrap		16.2	52.8	7.9
Source Bureau of Labor Statistics, Updated June 15, 2016 Compiled by Ken Simonson, AGC Chief Economist				



Higher Education In Transition

*I*t could be argued that America's vast higher education system is the nation's single most important global competitive advantage. Access to public education and then higher education was the key to upward mobility and the development of the middle class. So it's more than just a sector-specific problem when higher education institutions face difficulties, as they do now.

Colleges and universities have been vulnerable to cyclical changes for as long as they have been established, which means longer than the U.S. has

existed. Higher education is now in the midst of a troubling cycle that has caused the number of college closures to rise from two or three per year to an average of more than five over the past decade. The problems plaguing higher education aren't occurring universally. Large universities, whether public or private, have fared well, while smaller colleges have struggled. For-profit universities, which were thriving just five years ago, have been decimated by government investigations into recruiting and claims of results. Community colleges are in a renaissance of resurgence.

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The climate for higher education is something of a perfect storm of three trends, one with seeds in the 2009 recession. That economic downturn seemed to mark the high point in tuition growth, with students and parents becoming more cost conscious since. There are fewer college-aged students out there for the time being. And fewer of those students are going to college.

These three converging trends have put unusual financial pressure on colleges and universities. Fewer 18-22-year olds means fewer students paying tuition, especially since a smaller share of those kids are attending college. As colleges deal with having less revenue, increased competition is increasing financial aid. At a time when there are fewer students to recruit, it is costing colleges and universities more to obtain them. That's not a recipe for financial solvency.

"Cost or value has become a big issue," asserts Paul McNulty, president of Grove City College. "When you think of it as a business formula, everyone is cutting the sticker price in half. Incoming freshmen are getting a discount of 48 percent for 2017. Price has gone up way beyond incomes so schools have to cut costs. Tuition may be artificial to some degree but on some level it represents the college's costs."

Tough financial times today are compounded by the somewhat profligate spending that preceded them. The 1990s and especially the last decade saw a boom in college and university construction. While some of it was in response to advancing technology and growing enrollments, much of the construction was speculative or "me too" in nature. Debt service climbed as a portion of college and university budgets. When the downturn hit, big gifts dried up and the current tuition decline makes it tougher for colleges with high debt to keep up.

There is good news for colleges and universities. Even though demand for higher education has declined, the need for education has not. A recent University of Pennsylvania study found that just over 40 percent of PA residents between the ages of 25 and 65 had two years or more of college education. The same study estimated

that 60 percent of Pennsylvanians will need at least two years of higher education in 2030. That's a vacuum that needs to be filled in a relative hurry. It's a situation that isn't unique to PA. This gap between the need for education and the status quo represents the opportunity for higher education. From all indications, most colleges and universities are transforming themselves to benefit from that opportunity.

Demographics and Finances

The three-headed monster described above is ultimately about enrollment. Up until the disruption of the Great Recession, enrollment had grown almost constantly in the U.S., going back to the time that the country moved from agriculture to industry. Baby Boomers and their children provided a seemingly never-ending stream of more students each year. Educators could be forgiven for assuming that more kids would go to college every year. Having been disavowed of that assumption in recent years, educators have refocused on the subject of enrollment.

"It is a time of retrenchment. We see the schools we work with being really focused on enrollment," observes Sheldon Goettle, partner at PWWG Architects, a firm with a deep resume of higher ed projects. "I sit on the board of Wilson College and we talk about that subject at every meeting."

Data compiled by the government's Digest of Education Statistics shows that from 1968 through 2011, the share of 18-to-24 year olds attending college grew steadily. In 1968, 25.5 percent of those of college age were enrolled in a college. That share

remained the same until a significant jump in the late 1980s. By 1996, the share of 18-to-24 year olds enrolled in college had jumped a full ten points. Enrollment figures grew rapidly again in the midst of the housing bubble – when home equity was used liberally for tuition – and in the resulting recession, when lack of employment options became an incentive for young people to attend college rather than work.

One problem caused by this 500-point jump in enrollment share from 2001 to 2011 was that it fulfilled the prophesy of



	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2015
Total institutions	977	951	1,041	1,409	1,708	1,851	2,004	2,525	3,152	3,535	4,084	4,495	4,724
Total faculty	23,868	36,480	48,615	82,386	146,929	246,722	380,554	450,000	675,000	824,220	1,027,830	1,439,144	1,544,060
Total fall enrollment	237,592	355,213	597,880	1,100,737	1,494,203	2,444,900	3,639,847	8,004,560	11,569,899	13,538,560	14,791,224	20,313,594	20,207,400

Source: U.S. Department of Education, National Center for Education Statistics.

Since the turn of the 20th Century faculty, enrollment and the number of colleges have grown at disproportionate rates.

those who took the “build it and they will come” approach to facilities planning. As enrollments began to fall in 2012, many institutions have found that the facilities built during the golden years of the 2000s are underutilized. For the many institutions that took on debt to build, the decline is creating unexpected financial pressure.

“Our universities generally have seen a decrease in enrollment because we haven’t had as many high school kids graduating in Pennsylvania,” says Robert Unger, director of construction for the Pennsylvania State System of Higher Education (PASSHE). “A few of our universities have changed requirements for student housing from freshmen-only to include sophomores to maintain the occupancy levels they are required to have to meet obligations with private developers.”

The decline has been relatively precipitous and is gaining momentum. Enrollment fell one percentage point each in 2012, 2013 and 2014, before dropping 1.9 points in 2015. That essentially reset the number of college students back to the 2002 level.

Affordability is very clearly playing a role in the decline, as is the renewed emphasis on trades, but the simplest explanation is the smaller number of 18-to-24 year olds. Educators could have guessed that escalating costs would reach a point of inelasticity. Most could be forgiven for missing the impact of the skilled workforce shortage. But no college administrator should have missed the demographics.

The birth rate of the children of the Baby Boomers was compressed somewhat compared to previous generations, as more of the leading edge of the Boomers delayed child-rearing in the 1970s. The peak year for births of the Millennial generation was 1990, when 4,158,000 babies were born, but more than four million babies were delivered from 1989 through 1993. After that year, births declined and stayed below four million until 2000. In the trough year of that trend, 1997, there were 3,881,000 babies born. That meant there were going to be almost 300,000 fewer 18-year olds in 2015, regardless of any other social or economic factors.

Of course, it’s likely that few did miss the demographic signs. What’s more likely is that success or complacency led educators to expect that the impending problems would not occur at their institution. Some of those educators were wrong.

The drop in enrollments is hardly consistent. Smaller private colleges have been hit harder than the average. For-profit schools have been dramatically impacted. These types of schools are less flexible with tuition and often have smaller endowments from which to draw assistance. Private colleges have also been more heavily weighted towards liberal arts, which has made them less appealing to students looking for technical or in-demand career majors.

One of the differentiating factors between those struggling and those that are not is the size of the endowment that the school has at its disposal. College endowments were hit hard during

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the financial crisis but investments have more than recovered since then. Administrators and trustees who have endowments in the billions have more flexibility for supporting financial aid. Moreover, universities with the largest endowments are generally those with the largest enrollments, and therefore the largest alumni base. That can come in handy in tough times.

Penn State is a great example of the latter point. Following the news of the scandal surrounding Jerry Sandusky, the firing of Coach Joe Paterno and the search for answers divided Penn State alums. Yet over the next year, Penn State saw giving grow at a faster rate. While the scandal embarrassed some alumni, more Nittany Lion grads felt the urge to support their alma mater during trouble. With more than 645,000 living alumni, such an urge can mean big money. Universities like Penn State have responded to the increased competition by asking for more scholarship support and have been getting it.

At the other end of the spectrum, small colleges and universities with small endowments can't divert investment proceeds towards more scholarships in a meaningful way; and appeals to a smaller alumni group understandably bring smaller results.

The financial pressures felt by public and private non-profit institutions pale in comparison to the problems that for-profit colleges are experiencing. Once a rapidly-growing segment of the higher education landscape, for-profit schools have seen enrollment decline 28 percent from September of 2011 to September of

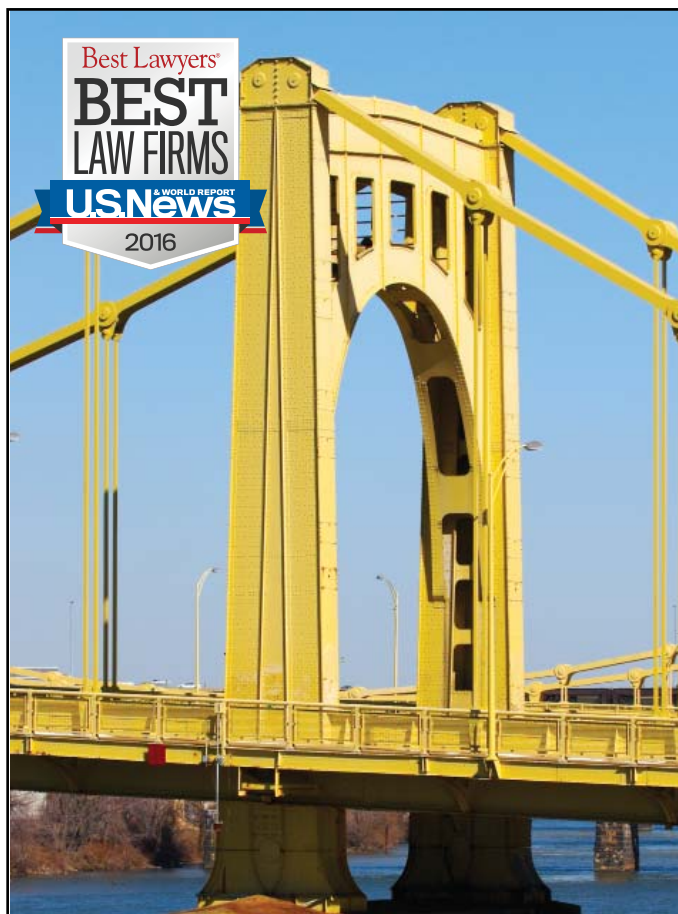
2015. At the center of the decline are charges that these schools engaged in deceptive marketing practices and didn't deliver on promises of post-graduate careers.

Colleges under investigation have lost federal scholarship qualification, a devastating blow. The loss of esteem of these multi-state institutions has been equally significant. Corinthian College was forced to close its doors. The University of Phoenix has seen enrollment fall from a high of 470,800 in 2010 to a February 2016 mark of 179,000. Strayer University shrank from 60,700 in 2010 to 43,000 in September 2015. Pittsburgh-based EDMC saw 60,000 students shaved from its peak of 150,000 and agreed to a \$100 million settlement with the government in November 2015.

Amid this gloomier news there is an upside for higher education. During the mid-2000s, the birth rate soared again, with nearly 4.3 million births in 2006. That means almost 400,000 more 18-years olds will be entering college age in 2024. The trick will be to thrive or survive – until then.

Trends and Potential

Until the demographic and financial tides change for higher education, it's worth noting that colleges and universities will still be buying construction services. Unlike many categories of construction, college facilities are occupied by the project owner, meaning that decisions made about construction won't always be about lowest first cost. Higher educational facilities add value to



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the campus and student experience and, as such, college projects offer more opportunities for value-added services.

One place this dynamic has been manifest is in project delivery. Owners of higher educational institutions have been at the forefront of some of the innovations in technology and delivery of projects that have been developed for the construction industry. Higher education projects usually serve multiple constituencies at the university, meaning decision-making can be fragmented and programs more dynamic than most from beginning to end. Key professors or researchers are recruited or leave. Donors are found.

Those variables make a collaborative project delivery system a better solution for colleges and universities. At the region's three biggest higher education construction users, some form of alternative approach to project delivery is being used.

Penn State has taken the collaborative approach the furthest, now undertaking a major project – the \$50 million AgEngineering Renewal - using an integrated project delivery (IPD) agreement. Penn State previously used hybrid forms of IPD without a formal contract linking the design, construction and owner's teams.

"PSU began this journey towards a more formalized collaborative process in 2011. Through our involvement with COAA, LCI, and the AIA-MBA Joint Committee we began to be exposed to projects across the country that were successfully applying collaborative and lean principles," explains John Bechtel, assistant director, design and construction at Penn State's Office of Physical Plant. "Also, leading industry research continues to indicate a positive impact of more integrated projects. Success is more likely with integrated and cohesive teams."

Bechtel says that the success had along the way with progressively more integration led logically to attempt to deliver a major project with a formal IPD. "We have been moving in this direction for a number of years, applying various IPD principles with



That approach may seem logical on projects like the recently-completed \$82 million Scott Hall or the \$107 million Tepper Quad, but CMU has also hired CM's and architects at the same time for projects as small as the \$13 million Hamerschlag maker space and the fairly straight-forward 40,000 square foot new Tata Consulting Services building.

positive outcomes. This was the next logical step. We consider IPD to be a delivery method that will help us deliver the best solution in the most efficient and cost-effective manner," Bechtel concludes.

Carnegie Mellon's Ralph Horgan refers to his university's approach as "IPD light" because of its use of traditional separate contracts between the professionals, but in both spirit

and practice CMU has delivered most of its major projects in an integrated manner for the past five years. Its approach is to select construction managers and architects during the programming stage, usually within a very short time period. That approach may seem logical on projects like the recently-completed \$82 million Scott Hall or the \$107 million Tepper Quad, but CMU has also hired CM's and architects at the same time for projects as small as the \$13 million Hamerschlag maker space and the fairly straight-forward 40,000 square foot new Tata Consulting Services building.

Pitt hasn't delivered an IPD project and generally uses design-bid-build to deliver its projects; however, new Assistant Vice Chancellor for Facilities Scott Bernotas brought the concept of job order contracting (JOC) to the university. Bernotas used JOC regularly during his time with Naval Facilities and chose to employ the delivery method as a way to meet the needs of certain kinds of projects. Gregory Scott, the new senior vice chancellor for business and operations, also had experience in the Naval Civil Engineering Corps and endorses Bernotas' initiative.

"Job order contracting helps us be more responsive. In a larger institution we have controls and procedures in place that can sometimes get bureaucratic and slow things down," Scott emphasizes. "There are times when we need to respond in an urgent manner and [JOC] allows us to go out to a prequalified set of contractors, working with a set of pricing and conditions. We can give them a scope of work and get a project done in a matter of weeks."



Carnegie Mellon's proposed site for its 425,000 square foot "Gateway" project (lower right) lies below the Carnegie Museum and across Panther Hollow from the Collaborative Innovation Center.

Another qualitative trend that is developing is the expansion of higher education that is not delivered in the four-year undergraduate model. Community colleges and technical schools, which bestow associates degrees in two years, have been growing at rates that outstrip the demographics. These schools are meeting two very specific needs that today's students are expressing with increased frequency: workforce training and affordability.

Many of the programs at community colleges are still aimed at introducing students to college life in a less expensive and lower stress environment, with the intention that the student move from the community college to a four-year school to complete his or her undergraduate degree. Two-year programs are increasingly aimed at sufficiency for the student, with the aim of making the undergraduate degree unnecessary. Community colleges and technical schools offer a focus on the skills being demanded by the workplace, albeit at the cost of exposure to a broader education. Recent capital projects at community colleges in Westmoreland, Butler and Cambria counties reflect the health of that segment of the higher education market.

Community College of Allegheny County is by far the largest of the community colleges in Western PA. With over 61,000 students enrolled at four campuses, CCAC has the largest physical plant and capital budget. In his third year at the helm, CCAC President Dr. Quintin Bullock says that a growing and changing mission is influencing its plans for construction.

"In line with the college's strategic plan, CCAC continues to explore ways of enhancing the programming and services it offers to students," he explains. "To that end, CCAC has employed the services of the architecture and planning firm

Celli-Flynn Brennan to assist CCAC in the preparation of a system-wide Facilities Master Plan designed to help the college identify space and usage optimization opportunities throughout CCAC's network of eight campus and center locations."

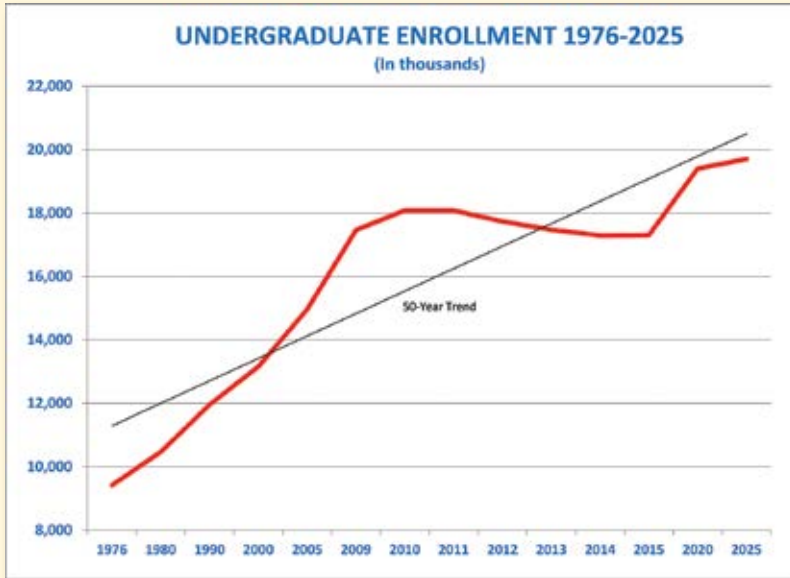
Meeting the needs of students is generally the rule for capital expenditures at colleges and universities, but the emphasis on recruiting and retention has sharpened the focus at most institutions. Schools are now asking more pointed questions about the justification of projects. Five years ago, everyone knew they needed a STEM building but questioning how a STEM building fits into its mission and curriculum, many schools have mothballed STEM projects in favor of facilities that are more responsive to what their students need.

Grove City College is such an example. After completing a STEM building as the first phase of a \$75 million science and engineering program, the school is building a new field house to serve the needs of its students competing in seven varsity sports. In the fall of 2016, Grove City will enroll 60 freshman football players (compared to 25 previously) and is spending resources to improve facilities for a category of students that had been largely ignored. Its next project will be to retool the library. The second phase of the science and engineering project will follow.

"We're just coming off a master plan review at the first of the year," says McNulty. "We're asking what our priorities should be."

The emphasis on athletic facilities is another trend for colleges in Western PA. Penn State is completing the three-phase expansion of its \$85 million Intramural Building. Pitt is investing millions in modernizing the Cost Sports Center, Trees Hall and is getting ready to kick off a plan for varsity athletic facilities. Washington & Jefferson University is spending \$14 million to expand its Cameron Rec Center and spent \$4 million to upgrade its tennis courts last winter. The aim of much of this spending is to provide better athletic facilities for the students who aren't varsity athletes, regardless of the size of the school.

Schools and architects are taking the lead of private developers in reexamining the priorities of student housing. Colleges and universities replaced millions of traditional dormitory beds with apartment-style residence halls over the last decade or so. Trying to anticipate the wants of a new generation – while justifying dizzying tuition hikes – colleges used amenity-rich residence halls as recruiting tools. While the spending and design may have pushed the envelope too far in some cases, the emphasis on providing a lifestyle through residence halls isn't a trend that's changing. There are some lessons to be learned from the earlier boom.



Undergraduate enrollment (shown in red) doubled during the 30 years following 1976 but has since declined. Source: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survey (HEGIS).

One important infrastructure lesson learned was that technology can't be anticipated well. The shift from heavily wiring CAT-6 cables to enabling wireless to accommodating mobile devices happened in a few years. Most engineers and facility departments couldn't (and didn't) plan for that rate of change during design and construction.

Another concern, somewhat related to technology, is about the disengagement that happened with many students living in the new residence halls. Intended to provide more privacy, the new living quarters could enable students' tendency towards privacy instead of community. New designs – whether for private apartments or institutional buildings – are reducing the size of bedrooms and living areas in the units in favor of enhancing public community spaces. This trend is prevalent in apartment design in general. "If we make it comfortable for students to go into a cocoon in their rooms then they don't become as engaged in campus activity," observes Goettel. "That's an important part of the college experience. For the advancement people, of course, the worry is that ten years out the student will have no allegiance to the college."

During the "go-go" years of construction in higher education, it wasn't necessarily in vogue to make design and physical

plant decisions that considered the impact of the facilities on the institution's long-term finances. That's not to say colleges didn't care what buildings cost over the past decade or so but it's clear in 2016 that administrators are trying to take into account how the programs of the college can deliver quality education and fit into a strategy of fiscal improvement. At the major universities in Western PA, technology transfer is a major strategy for financial health.

Carnegie Mellon and the University of Pittsburgh have both developed global reputations for the research done on their campuses. Pitt's medical and biomedical research has attracted first rate talent and helped drive the growth of UPMC. The current federal grant environment has been a drag on medical research and the university is working hard now at creating new paradigms for attracting research funding from the private sector that can be used to monetize its research.

"There certainly are opportunities for collaboration, although I can't tell you anything specific," says Greg Scott about Pitt's planning for research. "What I can tell you is we are exploring all avenues of collaboration. We are looking at UPMC certainly, but also at CMU and other universities, and with industry as well."



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The June 15 announcement by ANSYS and Pitt of the ANSYS Additive Manufacturing Research Lab to further research into the use of additive materials is an example of the latter.

Much of the news surrounding technology transfer of late has centered on CMU. The university has been engaged in commercializing its research for decades but has become more aggressive in ensuring that CMU benefits from the gains. The emphasis on technology transfer has attracted talented students, teaching and research talent, and companies looking to partner with CMU's researchers and students. Google may be the most public of these companies that are coming to Pittsburgh but the same motive is behind recent announcements by Tata, ANSYS, Apple and Uber.

A number of Carnegie Mellon's high-profile capital projects have been mostly about technology transfer, including its newest building to open.

"One of the drivers of [Scott Hall] was that there are no classrooms. It's all research labs," notes CMU's Horgan. "We were very specifically trying to create spaces that are overhead recoverable. The only thing that we have in there that is not eligible for federal overhead research dollar recovery is the café. That was how we were going to pay for it. That's your debt service over the long haul."

What to Expect

While CCAC awaits the recommendations of its master plan, it is moving ahead with developing space for its growing workforce development programs.

"CCAC is also exploring other educational possibilities including the potential development of a new workforce development center in Donora, PA. A feasibility study is currently underway to assess community interest and programming needs," reveals Bullock. "In other exciting news, CCAC, together with dck Worldwide, LLC, recently unveiled a conceptual design for a new workforce development center being considered for CCAC's Allegheny Campus on Pittsburgh's North Shore."



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The forecast for the PASSHE universities is a mixed bag of opportunities. For the most part, State System universities are dependent upon the commonwealth's budget and disbursement for capital funding. Given the budget politics since the Wolf Administration began, there is little to be said about forecasting that subject. Bond-issuing by the universities' individual foundations, which fueled many of the large construction projects of the past 20 years, has virtually ended. Challenges to the authority of such foundations and the poor financial performance of most of the projects built have eroded the effectiveness of the foundations to fundraise and sell bonds.

According to Bob Unger, the greatest share of the \$65 million in capital spending by PASSHE schools is now on renovation and infrastructure. On the few large projects, the changes in conditions since the recession have led to reducing scope or major revisions to the project's purpose.

"We had one project, Miller Auditorium at Slippery Rock, which was programmed for a larger auditorium and a black box theater," Unger says. "Before it went out to bid, Slippery Rock said it didn't make sense to the academic set up of today. They went back to DGS and asked for funding to do more programming and 'down scope' the project."

There are still a handful of projects that remain from the salad days of construction in the PASSHE system. These projects were in the planning cycle when the slowdown occurred early in this decade.

Among the larger projects in the hopper is the \$24 million Miller Auditorium, which is in construction documents and could bid in late 2016. Also at Slippery Rock, the Spotts World Culture building will be almost completely renovated. That \$5 million project should bid in September.

At California University, Desmone Architects is doing design development on a \$9 million conversion of Coover Hall into an energy technology center. That project should be ready to bid in December or January.

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DGS expects to advertise for design services later this year for Indiana University's \$90 million replacement for the Wyandt/Walsh Halls.

Further east, Bloomsburg University is planning a \$31 million renovation to the Waller Administration Building and a \$76 million information commons is in design at East Stroudsburg University.

Penn State is at the beginning of planning its 2018 master plan update. The commonwealth's largest university has spent \$3.2 billion over the past decade and has a handful of major projects in design for 2016 or 2017 starts. Among them are:

\$100 million East Halls Phase 1B (Clayco/DLA+/Mackey Mitchell); the \$9 million Ag Digester and Barn Replacement (Mascaro/Tetra Tech); the \$22 million Recital Hall and Music I Renovations (Bostwick Design/William Rawn/PJ Dick); the \$25 Million Trippe Hall at the Erie campus (Turner/Ayers Saint Gross + Noelker Hull); and the \$15 million Deike Building Renovation (Bostwick Design Partnership/Mascaro).

At Carnegie Mellon, the region's largest higher ed project – the Tepper Quad – is under construction and a few new projects are in the hopper for 2017 and beyond. There has been no decision made about development/construction teams for the 425,000 square foot Gateway mixed-use site, as due diligence continues. ANSYS recently announced plans to put a 30,000 square foot new research building on CMU's campus, to be located in the plaza between Porter Hall and Hamerschlag Hall. Mascaro and SOM were chosen as the team to deliver the new 40,000 square foot Tate Consulting Services building on Forbes Avenue just east of Craig Street.

Further west in Oakland, the University of Pittsburgh is concluding construction on the last of a handful of major science and engineering school renovations funded by DGS over the past decade. Chancellor Steven Gallagher and his executive team are in the process of planning for a major capital campaign that should make Pitt a center for construction projects in the next decade.



New leadership at CMU and Pitt are continuing to expand the collaboration between the neighboring universities that Jared Cohon and Mark Nordenberg began.

For now, Pitt's projects in the current \$36 million capital budget are smaller than in past. The largest of the projects is \$7.2 million in laboratory renovations on the 10th floor of the Starzl Biomedical Science Tower for the Department of Immunology. Other significant projects include the \$6.5 million in renovations at UPJ's College Park Apartments, which were last used in spring 2013; \$5.7 million to create the Marilyn Horne Museum and Exhibit Center at the Bradford campus; and a \$5.3 million renovation at the Cost Sports Center.

"We're about one-third of the way through capital planning," notes Scott. "We will certainly have new construction in it and also have renewal of space, restacking of space to get facilities aligned with department growth."

Scott says Pitt will also be looking at the aging parking garage inventories and exploring whether it needs more or less parking, or relocation of parking. And, of course, a focus of the plan will be the best use of the former Syria Mosque site, which the university purchased back from UPMC earlier this winter.

"We're just beginning to take a look at the site," Scott says. "There are no firm plans but the Syria Mosque site is certainly a priority of ours." **BG**

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The soaring, brightly-lit, multi-level "collaboratory" provides space adjacent to the labs for researchers from multiple disciplines and projects to work through solutions together. The main level of the collaboratory links to the Rothberg's Roasters café and the other colleges served by Scott's labs.

SHERMAN AND JOYCE BOWIE SCOTT HALL

Michael Kuhn, Jendoco Construction's president, has been working on projects at Carnegie Mellon University (CMU) for most of his career. As a project manager, Kuhn had seen his share of complicated projects and ambitious schedules accomplished over the years at CMU. He led the effort to make the proposal to Carnegie Mellon that won them the Scott Hall project in December 2012. But the process of design and construction of the 110,000

square foot, \$75 million research building was unlike anything Kuhn had experienced. He wasn't the only one to feel that way.

"Ralph Horgan and I sat in this collaboratory during the week that people started moving into the building. He looked at me and said, 'Michael, what we've done is a damn miracle'," Kuhn laughs.

Like with many major college capital projects, Scott Hall began with a problem and a gift.

The problem was a good one to have. Advances by the College of Engineering at CMU had elevated the level of research and funding at the university in the fields of computer science, mechanical and electrical engineering, biomedical engineering, energy, and an emerging field, nanotechnology. College of Engineering was the school at CMU that still bore the institution's original name – Carnegie Institute of Technology (CIT) – and was leading the transformation of the university into a top four or five name in engineering globally. Its facilities, however, weren't adequate for the task. The clean room was 30 years old. The best talent in the world wasn't looking for facilities that existed when computers were booted off floppy disks. That's where the gift came in to play.

John and Claire Bertucci were CMU alumni who made a \$5 million gift to enable the construction of a state-of-the-art clean room for nanotechnology research. Now there needed to be a place to house these new facilities.

"The original need was to build a clean room. We had a donor – the Bertucci's – and we were looking to put it into the Carnegie Square project, what we now call the Gateway site," says Ralph Horgan, assistant vice president, Campus Design and Facilities Development (CDFD). "That was not viable so we considered doing it on the Morewood parking lot – where the Tepper site is now. The dean and senior leadership really felt that was far removed from where the rest of the researchers were and we wouldn't want to be taking samples to these sensitive instruments back and forth across Forbes Avenue. That's when Pradeep asked if we could build something on that hillside."

"That hillside" was a steep slope that was located at the northwestern corner of the Mall, just beyond Wean Hall and adjacent to where Hamerschlag Hall's plaza dropped off 20 feet to a parking lot for service vehicles.

Horgan refers to Pradeep Khosla, now chancellor at University of California Santa Barbara and then the dean of the College of Engineering at CMU. Khosla was one of the driving forces behind the research and advancement of the College of Engineering. He had become convinced that a building could work on the site. Members of CDFD were less than certain about what would work on the site and what would ultimately be programmed into the project. That uncertainty shaped the decision-making process.

"We had so many uncertainties about what we were going to ask for that we decided to pay designers in a competition to give us their ideas because we weren't quite



The nano-fabricated dichroic glass used on the southern elevation of Scott Hall appears to be colored differently from panel to panel depending on the angle of the sunlight that the glass reflects.



sure about how this thing might fit in there," Horgan explains. "So we said let's have a design competition where we have some serious professionals come together and propose solutions to us. That's the only time we've done that here. Our typical process is to say please don't define our solutions; we together will define our solution."

"We put together a committee made up of the dean, representatives of CIT, representatives of the Board of Trustees and the university's design review committee, about 15 people on the

committee in total," continues Bob Reppe, director of design at CMU. "We had the four design teams come do a workshop with us at the beginning of the process; then they went away for two months and came back and made presentations to the entire selection committee. We did a first round of voting to see where they stood."

Reppe says that the voting revealed an almost unanimous sentiment for the firm Office 52 from Portland, OR. "The vote was 12 to three. We actually had the members rank the firms and

12 ranked Office 52 first; the other three ranked them second," he recalls.

Office 52 had been in existence just nine months at the time it was chosen to design Scott Hall. Its principals, Isaac Campbell and Michelle LaFoe, had impressive personal resumes on similar projects while working at other firms; but nonetheless, CMU took something of a risk by selecting the fledgling firm over its established competitors like ZGF, Bohlin Cywinski Jackson and Wilson Architects.

"The university's original proposal for the site, which was done by IDC Architects, was a seven-story building," Campbell notes. "There were smaller floor plates. This was going to do a couple of things. It was going to consolidate the building in a more tightly stacked configuration but it was also going to place very sensitive labs in pretty close proximity to the freight rail line that's down at the bottom of Junction Hollow. It was also going to require that we dig out the entire hillside beside Hamerschlag Drive, which included removing and relocating the main electrical feed for the entire campus.

"We looked at that and it seemed like a huge amount of risk and cost to add to the project. It was sort of obvious to us that if we took those sensitive labs in the bottom three floors of the

building and put them in the courtyard in an at grade condition, they would be further away from the railroad tracks and we could isolate them from vibration," continues Campbell. "We could then leave the main utilities in the hillside in place, not incur the cost and risk of moving them."

Office 52's decision to propose a different physical design made its proposal stand apart from the others. It may seem an ill-conceived strategy to disregard a client's proposal instructions – although that was the purpose of the competition on some level – but Campbell insists that it was a logical approach for his fledgling firm.

"Part of the reason we proposed the idea we did was we thought it was a better solution but in some measure we were driven to search for that better solution because we knew there was no reason the university should hire us unless we had an idea that was clearly superior," he asserts.

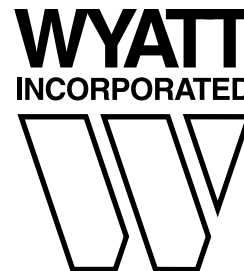
Within a few weeks of selecting Office 52, CMU went out to the market for construction management services. A handful of construction firms were chosen to put together very detailed proposals. One of the firms, Jendoco Construction Corporation, had worked on Carnegie Mellon's campus for decades but had not done a project as large as Scott Hall before. The selection

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committee didn't see that as a concern, instead looking at the positive factors that Jendoco brought as more compelling.

"One thing to realize is that the project started out as a \$60 million project and so when we went out for CM's the project had a hard cost that was probably more like \$40 million," recalls Andrew Reilly, director of construction at CMU. "Jendoco had just completed – and this was one of the feathers in their cap – Doherty Hall Phase Two for us, which was a \$27 million renovation of a science building. [That was a] tough site. We had to underpin the whole foundation of the building. That was something that we looked at very favorably."

Jendoco also included Jacobs Engineering on its team as the clean room consultant. Jacobs had an extensive clean room resume and with the clean room as the genesis for the Scott Hall project, that selection was another factor that swung in favor of Jendoco.

The Bertucci clean rooms were going to be among the cleanest on the planet. Whereas it's common for a lab to have Class 1000 clean rooms with a single Class 100 room. The Bertucci labs were going to be Class 100 with two Class 10 rooms. As in, ten particles per million.

"The clean room is the heartbeat of this building. If that clean room's not successful, the project's not successful," notes Kuhn. "We took the approach of engaging Jacobs, which was already on the design side for the clean room and the labs, but they also have a construction division. Our argument was that these are the guys that are out there building them and they will know better what the potential issues are."

The Bertucci clean rooms were going to be among the cleanest on the planet. Whereas it's common for a lab to have Class 1000 clean rooms with a single Class 100 room. The Bertucci labs were going to be Class 100 with two Class 10 rooms. As in, ten particles per million.

"We also knew that we were always going to have budget pressures on Scott and we thought that Dwight Kuhn and their estimating team was top notch," echoes Horgan. "We wanted good estimates with super scant information, with a proven

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entity. Doherty Hall Phase Two was a great example, not just working with historic building but also coordination across multiple departments.”

The wisdom of the construction management decision would become apparent immediately. Scott Hall was going to be one of the most complex projects CMU had attempted. The complexity was mainly due to three things: the program, the site and the connections.

Scott Hall’s scope of work began to expand almost immediately. The uncertainty of the program that Horgan says influenced the decision-making process haunted the early stages of design development. Within the first year of planning, alums Sherman and Joyce Scott made a lead gift for an energy innovation institute to be named after Sherman’s father Wilton E. Scott. Their gift also gave the building a name.

In addition to the clean room opportunity, Scott Hall’s second main purpose was to move the growing Biomedical Engineering Department (BME) from the Pittsburgh Technology Center on Second Avenue onto main campus. BME had recruited a new department head and was attracting talent that was among the tops in the field worldwide. The anticipation of moving from along the Monongahela River to a world-class research facility on campus was a major draw for both the engineers and the new dean, Dr. Yu-Li Wang.

PROJECT TEAM

Jendoco Construction Corp.....	Construction Manager
Carnegie Mellon University.....	Owner
OFFICE 52.....	Design Architect
Stantec.....	Architect of Record
Arup Group.....	Consulting Engineer
Jacobs Engineering.....	Clean Room Consultant
Ruthrauff Sauer.....	HVAC & Plumbing
Miller Electric Co.....	Electrical
Phoenix Roofing Inc.....	Roofing
Preferred Fire Protection.....	Fire Sprinklers
Amthor Steel Co.....	Steel Fabrication
Abate Irwin Inc.....	Steel Erection
Mendel Steel.....	Ornamental Metals
Noralco Corporation.....	Excavation/Demolition
Modany Falcone Inc.....	Concrete Finishing
Norco Painting.....	Painting
Massaro Industries.....	Ceramic Tile
Flooring Contractors of Pittsburgh.....	Carpet/Flooring
Franco Associates.....	Masonry
D-M Products Inc.....	Curtain Wall
A. Folino Construction.....	Concrete
Wyatt Inc.....	Drywall/Fireproofing
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The roof over the Level 10 clean room is planted with grass and extends the former Hamerschlag plaza back to the main entrance to Scott Hall. A skylight floods the corridor outside the clean rooms with natural light.

Scott Hall now had three of its floors allocated. BME would have two floors and the Scott Institute would occupy a third. CDFD felt that because there would be no more construction on that portion of campus there should also be a floor for future expansion. ("Because at some point that vacuum would want to be filled," jokes Horgan.)

But figuring out how those occupants would translate into program and building took more than a year of designing and pricing schemes. From what ultimately would be 27 schemes, the construction team ultimately figured out how to make PK7 (the schemes were given Khosla's initials) fit within the budget. Along the way, Scott Hall had grown from 70,000 square feet to 110,000 square feet.

Beyond the program considerations, Scott Hall's site was also causing significant problems for both design and construction. Aside from the slope and utility issues, which were unusually daunting, there was the fact that the building was located next to CMU's oldest structure. There were subsurface discoveries that were legacies of both the times and previous decisions to use that part of campus as the back door or service entry to Carnegie Mellon. Discarded bits of structures were found, including the original coal chute for Hamerschlag, which did not appear on any as-built drawings.

"I think that site was deemed unbuildable at some point," jokes Michael Kuhn.

Everyone involved agreed that it was a terrible site. The problem was it was located in the perfect spot.

"To say it was not buildable [isn't correct]. We told people on campus that it was a very, very difficult site to build a major science building on. There was a lot of stuff in the hillside," points out Horgan. "It was a really difficult site to build on but it was absolutely the best site for this science program that was going to draw together all these pieces of the college of Engineering."

"The site was not at all desirable for construction but it was the most desirable for Engineering," echoes Reilly.

One of the signature features of Scott Hall is the structural design of its columns that support the building from Panther Hollow below. Kuhn says that the design intent required some hefty subsurface work to accomplish.

"By creating these splayed columns that come down to a point load they were elegantly weaving the structure around the utilities. While in theory that makes sense, unfortunately the reality of the situation is that beneath each of those point loads is a gigantic pile cap with caissons," he explains. "We spent a lot of time relocating the utilities or in the instance of the main electrical feed to the campus, we left it and had to work around it. During a phase when we had to excavate underneath the electrical, we built a shoring system that actually hung the concrete electrical vault so that we could get the foundation that was needed underneath it."

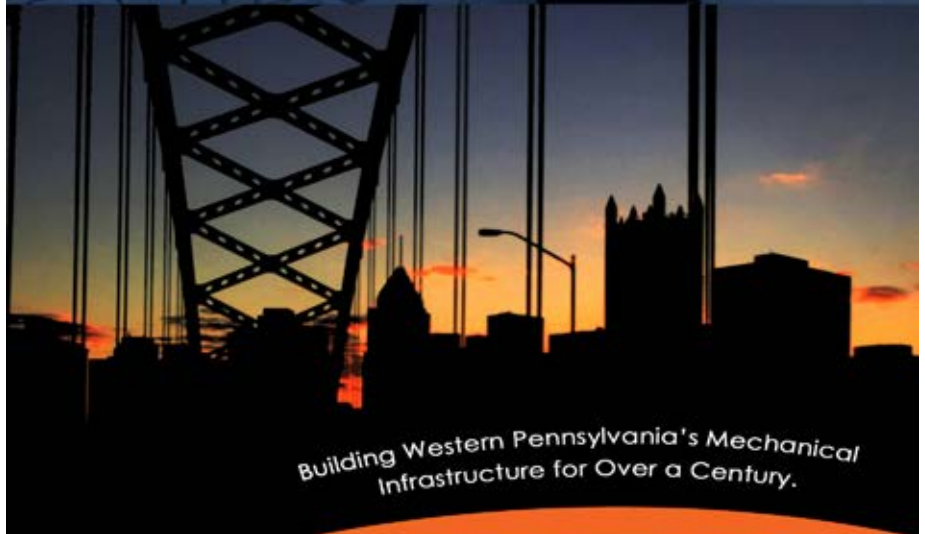
"It was the most challenging site I have ever worked on," says Jill Swenson, principal and project architect for Stantec. "Trying to fit a large program and research requirements that are incredibly sensitive on a site where there is a lot going on was a challenge. We were trying to dance around utilities while accommodating all the deliveries that were continuing to be made to the buildings on that side of campus."

The site's problems weren't limited to the subsurface headaches. Because of the working railroad line below, some of the steel – including the canted columns on the foundation piers – had to be erected from above. The curtain wall had to be installed from above. Access from above was similarly limited because the crane had to sit below the west wing of Wean Hall, meaning there were only a few feet of swing space. And the logistics for staging and supplying the job were limited by the dense urban setting.

During the first year after the teams were selected, the process of going through all 27 iterations of Office 52's design took place. The value engineering that occurred was stressful on the whole team and underlined one of the difficult dynamics of the multiple architect approach. Stantec's responsibility for detailing and specification meant that Swenson and her team were putting Campbell's design into practical context. Jendoco then had to price that more detailed design, often leading to its being the bearer of bad

news. The building's envelope is an example of how the value engineering impacted the project.

One of the more striking architectural elements is the dichroic glass used on part of the building's exterior. Dichroic glass is made by taking a piece of glass and layering different metal oxides nanometers thick on its surface in a vacuum deposition chamber. The glass that results reflects some wave lengths of lights and transmits others, giving the glass a polychromic character depending on the direction of light. The use of dichroic glass was an intentional nod to the work being done in Scott Hall.



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"We were very interested in the science that's happening in the building. There are many structures and patterns that exist at the nano scale, literally at the atomic scale, that also exist at the scale of our everyday lives that we experience and also probably exist at a scale that is much larger but are so big that it's hard for us to recognize," Campbell explains. "Many of the processes that they use – like vacuum deposition – are very fascinating. We became interested in how these patterns are represented and the processes that they use to create the science. We were really interested in [dichroic glass] as a representation of the type of technology that is used in the building. We wanted to bring that to the architecture."

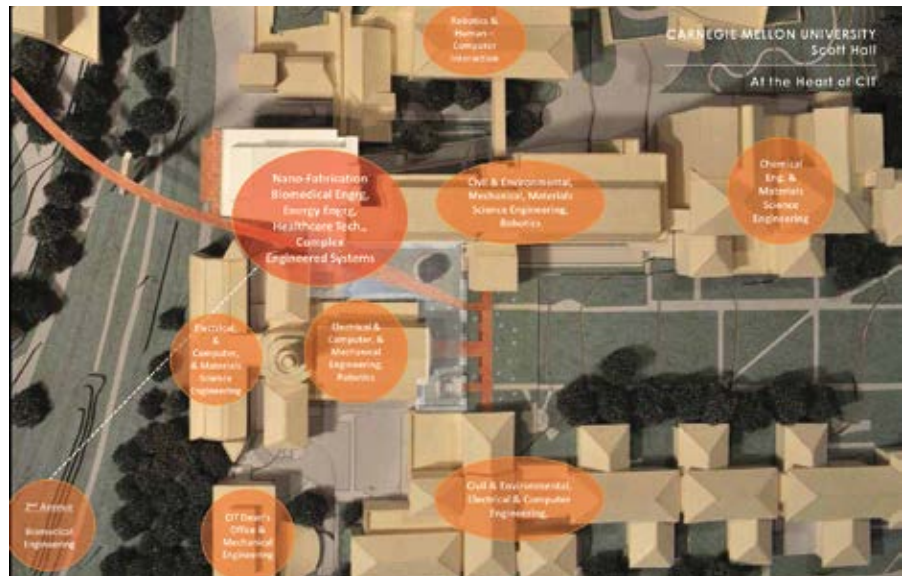
The north-facing Scott Hall was an excellent building to get the benefit of the dichroic glass fins, as they would vary in color throughout the day as the sun's angle changed with its daily movement across the sky. But during design, Scott Hall was also more than \$10 million over budget.

"The dichroic fins, during the original design, covered all three sides of the box," recalls Kuhn. "But obviously there's an expense attached to it so during value engineering they changed the design so that the dichroic fins were where people could engage with it. Rather than hang out over the Hollow the fins are up close to the plaza, where people can really engage with it."

Engaging people was a major aim of the building. In many ways success hinged on the clean room and its location. The clean room is a shared resource for the university and connecting it to all of the colleges was a key. So was connecting CMU's research to the brightest minds in the fields of study.

"The engineering college wanted to have something that said new and 21st Century," notes Horgan. "The whole point of this was not vainglory. It wasn't so Pradeep could say I have a pretty building. It's all about recruitment and retention of talent. The whole clean room program was because we were getting cooked on our clean room compared to other places around the country against whom we were competing for talent, both students and faculty. It was clear that was dragging down the hard sciences in CIT."

The location of the clean room under the Hamerschlag courtyard was the key to the success of the design. Aside from increasing the efficiency and reliability of the clean room, locating it adjacent to the ground level for Wean Hall meant that Scott Hall could be connected to Hamerschlag and Roberts via a bridge and then to all of the disciplines within the College of Engineering directly. The space directly next to the clean room access within Scott Hall is the Rothberg's Café; however, its location at the intersection of all of CIT's disciplines inspired the working name for the café throughout the project: the Crossroads.



The site for Scott Hall, although less than ideal for construction, was ideal for connecting the building to its adjacent users in CIT. Image courtesy CMU Campus Design and Facility Development.

"Moving the clean room to the plaza was a great solution," says Kuhn.

Anyone familiar with CMU's campus – and the Mall in particular – will understand how complicated it was to integrate the clean room and Scott's research labs with the rest of CIT. Each of the buildings Scott Hall was meant to meet have different floor elevations. Matching floor levels in a manner that meets accessibility codes was a challenge.

"It's analogous to Gates in that Gates was connecting campus spaces by taking what was kind of back of houses of lots of



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PROJECT PROFILE



A critical design decision was to elevate the first level of Scott Hall on steel columns three stories above the road at Panther Hollow.

buildings and putting something in that. The Scott connection is you have all these buildings that are almost connected and you plug this hole with this building," Reppe explains. "The really remarkable thing about the building is how it deals with all the various elevations. You have a road going underneath it, which is an elevation. The buildings that it touches, both Wean and Hamerschlag, the ground floors of those are eight feet off from each other. How do you mitigate those distances and how do you do it so that it's accessible?"

"Gates was about getting from the upper part of campus to the lower part of campus and from Forbes to the inner part of campus. What [Scott] is doing is getting from Wean through Scott to Hamerschlag all on one level."

The practical benefit of that difference in connectivity is that the buildings that Scott Hall connects are home to teaching and research in fields that are collaborative, or could be collaborative, assuming that collaboration was facilitated. Scott Hall makes a physical connection for work that is advanced by human intellectual connections.

"It has a direct building connection and department connections, CIT connections," says Reilly. "All of those buildings have CIT departments in them and now they can get from one department to another department under one roof."

Perhaps the aspect of this project that stands out most, although subtly, is the extended cycle of decision-making. That was driven largely by the fluid programming. Unlike most projects, where decisions are made primarily ahead of construction, the evolution of Scott Hall right through early construction was maddening.

Transition was also a theme for the project, as well as a testament to the time needed to get the project launched. During the project's full life cycle, CIT transitioned from Khosla to James Garrett as dean. Scott Hall was conceived when

Jared Cohon was president of CMU and opened when Subra Suresh led the university. The members of the design and construction teams, along with the staff at CDFD, remained intact throughout, however, as did one key CIT staffer.


"The one person who doesn't get adequate recognition for his role is Gary Fedder," observes Kuhn. "He was the liaison for the department so he was Pradeep's right hand man. He was the one who came to all those budget meetings. We saw Pradeep whenever it was time to get something settled but Gary was doing most of the work on their end from the user groups' standpoint."

The process was grueling for all involved. Jill Swenson estimates that Stantec had between 25,000 and 30,000 hours devoted to the project. Ralph Horgan praises Jendoco's project manager, Brian Miller, who he says had fortitude and passion to complete the job in spite of the grind. ("There were days when you wondered how Brian and our superintendent Ken Brace showed up for work," laughs Kuhn.) The haggling over what would and would not stay in the project often led to adding more to the scope, something the owner resisted firmly. Michael Kuhn doesn't think there will be any regrets in the end.

"Ultimately they were all very good decisions," he says. "For example, the need for support space created an opportunity to create a connection to Porter Hall. It's adding square feet but now there's this great stairway from the Mall down to the ground level on Porter Hall and Roberts Hall and such. The decisions enhanced connections, allowed for great spaces like the café, all of the program that they wanted. I'm sure if you asked the right people they would say they wish it was bigger!"

As the finishing touches were put on the clean rooms in June, the College of Engineering had the building it wanted to continue to excel on the global stage. In the context of CMU's campus, Scott Hall sits as a bookend, equal in height and setback to Scaife Hall on the other side of Hamerschlag. That was an intention of the institutional master plan, framing CMU's iconic building without competing with it.

"Jacobs did an incredible job with the clean rooms and the research labs. The building is going to be a good neighbor and a great addition to that end of campus," says Swenson proudly. "It will really help the School of Engineering do the research they have dreamed about doing."

"It is exactly what we envisioned and probably more in terms of how they interface now with their colleagues," says Horgan. "From an academic point of view it was clearly the right thing to do. It was a bear to get birthed. It got done thanks to our design team but big thanks to everybody from the Jendoco team. We had some very choice words exchanged in some very difficult meetings but I think everybody hung in. All of us are very pleased with it. I think the user groups are very pleased with it." 



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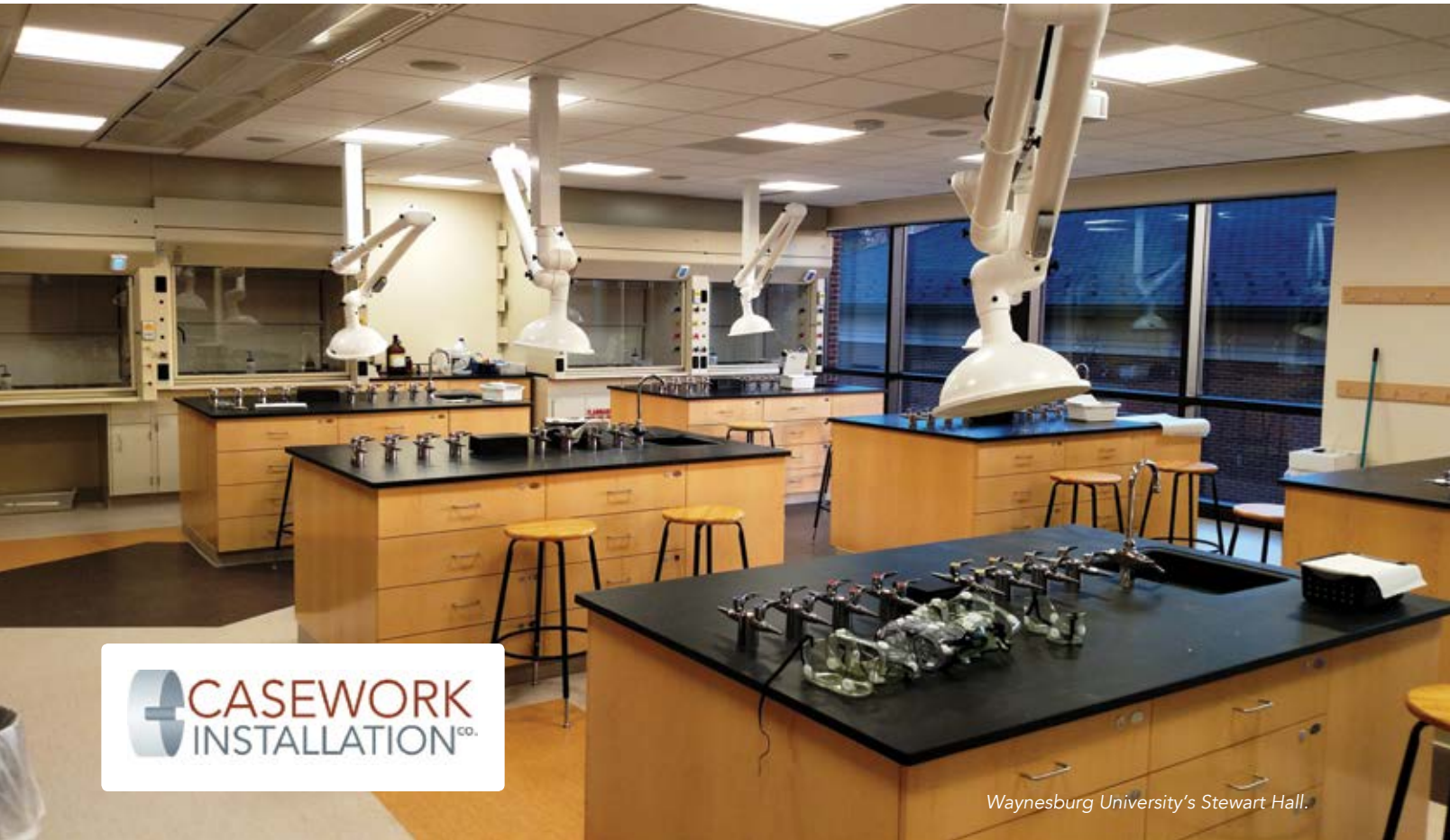
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As happens frequently in the construction industry, Casework Installation Company was founded by a talented young man with technical know-how and limited choices. Unlike many construction businesses, however, the company has thrived because the succeeding generations thought about the enterprise as a business rather than a trade.

Howard Bayles was an engineering student at Pitt but family priorities forced him to leave school to work. Bayles worked for a couple of casework companies that failed in the 1950s before landing as an expeditor for Warren Smith, a casework manufacturers' rep. In 1959, the manufacturers Smith represented decided to cease the practice of installation with their own crews and began subcontracting installation to its local reps. After a couple of years, Bayles took on the challenge of installing the work that he had been expediting and founded the Howard R. Bayles Co. in 1961.

Bill Bayles joined his father in the mid-1960s. During that period and into the 1980s, the boom in school work provided a steady market for the company to grow. Its work is on display in

virtually every college in Western PA. Casework Installation Co. has especially been a fixture on Pitt's campus, working on award-winning lab projects like those in the Biomedical Science Tower III, Chevron and Salk Halls. The company has a similar reach in the region's hospitals.

"At one time I saw a list of all the hospitals in Western Pennsylvania and the only one we hadn't done any work in was Divine Providence and shortly thereafter, we got a job there," Bill Bayles remembers.

Casework Installation's role in the marketplace is like a freelancer. The company works with several manufacturers but is able to install casework or millwork from any manufacturer or fabricator. As a subcontractor, it will bid in the competitive market based on its relationships and its judgment about general contractors and on most opportunities will quote more than one, if not all, of the contractors competing for the project. Likewise, manufacturers are free to look for other installers in the market, should they feel it is a competitive advantage. Casework Installations needs to make sure it is maintaining relationships with both contractors and manufacturers, in addition to accurately figuring the project.

One critical area of coordination for Casework Installation Co. is in the manufacturing of the products to be installed. The competence of the manufacturer, their ability to produce timely and accurate shop drawings and fabricate the material, is a key factor in Casework Installation's performance.

"It's been sort of fun," chuckles Bill. "Over the years we've done some really large projects. The challenge is that you have to work within the building as it is. It's not like you're walking into heaven and everything's in place and all you have to do is your casework. We're working with the other trades and it's that interlocking of our work with the other trades in the progress of the building."

One critical area of coordination for Casework Installation Co. is in the manufacturing of the products to be installed. The competence of the manufacturer, its ability to produce timely and accurate shop drawings and fabricate the material, is a key factor in Casework Installation's performance. Working with companies that can perform is obviously the easiest way to avoid being thrown off schedule by a manufacturer but that isn't always an option. Still, Bill Bayles says that the vast majority of the time late delivery wasn't an issue. Being one of the last pieces of the job helps with that but the timing can be a double-edged sword.

"We're the last guys out of the door," laughs Bill. "The day they opened Canonsburg Hospital was a Saturday and they had Channel 4 and the helicopter there and the news people, and I was still in the emergency room hanging pictures. The tour came in one set of doors and I went out the other."

Bill's brother Bob started working with the company in 1980. Howard Bayles died unexpectedly in 1984 and Bill took over running the business. In 1991, he and Bill formed a partnership and incorporated as Casework Installation Company.

Bill Bayles has three sons but only his middle son, Patrick, showed interest in construction. As a young man, Patrick went out on jobs with his father so he could get an idea of what the work was like. Bill says Patrick's interest in construction showed up much earlier than that, however.

"I built a house in 1985, when he was four years old," he recalls. "I was putting the ceramic tile in the bathroom and he would come in and help. He would lay tile for me. He has a mechanical aptitude. I found out over the years that you can get a lot of carpenters but not all of them are mechanics. It takes a bit more of a touch to do this and he always had that mechanical inclination. It helps understanding what's going on and where things go."

After graduating Washington & Jefferson College with a business degree, Patrick came into the industry, but not with his father's company. Before joining his father and uncle, he spent the early years of his career working for contractors. He did a stint with Volpatt Construction, which he found furthered his understanding of how to put a project together and how general contractors approach projects. Another valuable experience was his work in estimating and sales at a contractor that Patrick declines to name.

"The biggest thing I pulled from there was how not to treat people," he recalls. "The boss there was a 'do what I say' manager who yelled at people. I saw how people responded to that – you can't even call it leadership – and the most I got out of that was this is how you don't treat people."

Patrick says the experience made him more resolute that work had to involve some level of humor or empathy with the people with whom he worked. That philosophy is a continuation of the one with which his father managed Casework Installation Co.

"People who enjoy their work do good work," says Bill.

The three Bayles men worked together from 2008 until 2015, when Bill retired. Like in most family businesses, retirement doesn't mean he's gone from the scene. Bill jokes that he'll take Patrick's calls when he's not on vacation but Bill is also intentional about giving his son the room to grow the business in his own way.

"To make a transition like this you really have to step back," Bill explains. "Patrick is responsible for all the decisions. He does the bidding and the accounting. He does the shopping for the insurance, any purchasing we need to do. That's all on his plate because I don't think you can have somebody looking over your shoulder and be an effective manager; so I've stepped back."

"It's a good combination, with Bob in the field and me in the office," says Patrick. "I can call Bob up to consult with him if there's something that's going to affect a field scenario. He's got some years on me and it's good to take his two cents worth."

The Bayles are proud of the fact that the average tenure of the carpenters on its crews is more than 20 years. As Patrick talks about the kinds of training and certification his crews need, it's easier to understand the value of having crews with such longevity. Because of their clients, Casework Installation's crews have to have current infectious control (ICRA) training, and OSHA 40 certification. Their work at the various animal research facilities requires vaccinations that go beyond the norm. All employees have background checks for Act 34 and Act 51. All superintendents have training in CPR.

"Patrick and I both have business degrees. I learned about cost management. My concept always has been that you don't tie yourself up with a lot of overhead because when work gets lean or you're between jobs then you have all this money going out and the income isn't there. That has allowed us to endure the hard times," Bill explains.

Patrick says that the company employs six regular foremen. Each one has the training to act as project manager for Casework Installation Co. Beyond that the crews expand and contract from between a dozen to as many as 40 or more carpenters.


With crews of skilled carpenters, Casework Installation Co. has done finished millwork and specialty trim in corporate offices, Starbucks coffee shops and other retailers with high-end finishes. The company has been asked to replace the panels and trim in elevator cabs and to hang doors in major hospital projects. While most of its work is in educational and medical casework, Casework Installation intentionally makes use of its resources in a variety of installations.

"Versatility is really what's come into play as far as keeping up with things. If you're focused solely on putting the cabinets in schools, it's tough to stay sharp," notes Patrick. "We work with different companies that also specialize in different areas like lab companies, lockers. The good thing is we have guys that are talented enough that they can adapt. They deserve kudos for the work that they do, the dedication that they have had through the years."

Bill Bayles echoes Patrick's high regard for their craftsmen.

"We've always had a good relationship with the Carpenters. The Local here has been really good to us. Even when we went to Cleveland I got a lot of cooperation," he recalls.

Asked about the biggest challenges of running Casework Installation Co. into the next generation, Patrick says, "Adaptation. Being able to meet the challenges of new things, getting into things that are more commercial. The biggest challenge is probably maintaining a skilled crew. That's why we go through extraordinary efforts to make sure our guys are well taken care of. Let's be honest, I try to make sure they are working before I worry about myself. You don't want to lose somebody to another company.

"Any carpenter can put something in. It takes a good carpenter to make it look great," Patrick continues. "I think that's what sets us apart is the attention to detail and the relationships we have established with the general contractors or the end users. If you go into Oakland, most people know the name Bayles." 

COMPANY FACTS

Casework Installation Co. LLC

Patrick Bayles

Robert Bayles

108 Augusta Circle

North Huntingdon, PA 15642

T: 724-309-5213

www.caseworkinstallationco.com

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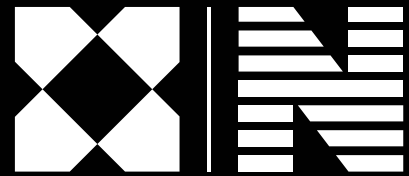
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Financial Perspective

Profit Fade – But I Made Money?

By Matt Nowaczynski, CPA

Contractors, like all companies, are in business to make money – and making money starts with profit margins. For a closely-held construction company, being profitable could help with the company's bonding program, could lead to obtaining better credit terms with its current banking relationship, and consistent profit, when managed properly, could improve the long-term health of the company's balance sheet. Outside observers might say that profitability is a good indication of being a good contractor, but profitability is only part of the story. Estimating the profit at the beginning of a project and managing the project accordingly to ensure the estimated profit is realized could be a better indicator of whether or not you, and your project team, understand the construction process.

The purpose of the opening paragraph is not meant to oversimplify the bidding process and the project management process, but simply meant to reiterate its importance. A company in the construction industry will have a difficult time realizing the original profit estimate as "perfect jobs" do not make up the majority of a contractor's work. There are too many variables working against a closely-held contractor in completing the project as originally planned. As such, the business owner(s) and the leadership team of the company should monitor the projects for profit fade. Avoiding the discussion because the term "profit fade" implies something is wrong – the estimate was incorrect, the project was not properly managed, the specifications or design was not reflective of actual circumstances, or a combination of these things – does not address the issue and mitigate risks that could be managed.

There are generally two types of profit fade, catastrophic and "death by a thousand cuts." A catastrophic event is very easy to spot and will most likely result in the business struggling to continue operations, while a "death by a thousand cuts" may be very hard to identify and could lead to the company's business partners viewing the company as having a "black eye," resulting in operational struggles or even the company's untimely demise.

Picture the following scenario, the early indications of a job your company is completing shows no signs of unanticipated costs and, in fact, the project billing is timely and comparable to the costs being incurred. There may even be an opportunity to "overbill" the client for work that you did not start and in which you did not incur any direct cost to complete the job. As time passes, your foremen and superintendents are not hitting their production targets, accounting is two months behind on entering invoices, and there is a delay with the accounts receivable. Cash flow starts to become a problem and there are other open projects with varying levels of demand consuming time and energy of the business owner(s) and the leadership team. The job that is experiencing profit fade is beneath everyone's radar, but the assumption is made that it is still on track. In reality, there is a problem with the project and corrective measures need to be taken now. If you wait too long, the only option may be to "take it on the chin" and complete the work.

Cash flow starts to become a problem and there are other open projects with varying levels of demand consuming time and energy of the business owner(s) and the leadership team.

the only option may be to "take it on the chin" and complete the work.

Fast forward to that next meeting with your bank, bonding agent or CPA – now you need to talk about that project. "What happened? What went wrong? Why?"

Your business partners do not want to talk about the jobs that are winners when there is an apparent "loser" on your

A contractor's ability to estimate costs on an open project is a crucial and a necessary skill set to have. In fact, in the eyes of the bonding agent, the insurance company and the bank, estimating the cost may be the MOST important skill set of a contractor. Being able to estimate the company's profitability with reasonable accuracy is what instills trust and confidence in the business owner and the leadership team.

WIP schedule (Work In Progress). Those partners will want to know what went wrong with the "loser" to confirm that the job was an anomaly and not the beginning of a new trend with the company. This job does not just impact your business relationship in the short term, but it impacts your long-term relationships too. A contractor's ability to estimate costs on an open project is a crucial and a necessary skill set to have. In fact, in the eyes of the bonding agent, the insurance company and the bank, estimating the cost may be the most important skill set of a contractor. Being able to estimate the company's profitability with reasonable accuracy is what instills trust and confidence in the business owner and the leadership team.

To address this issue, a properly designed accounting function with unfettered communication between the office and the field can assist the company's leadership team in spotting profit fade. In fact, timely and accurate financial information from the accounting department may be used to manage projects to stop, or at least control, profit fade when it occurs and, even better, turn the project around.


The accounting function begins with the business owner(s) and the leadership team. The tone "from the top" and the policies instilled will ensure that the field and back office communicate in a timely and an effective manner. Those individuals in the field have firsthand knowledge of the projects being completed. This key information assists the back office in pulling together the necessary financial information, which may help the project managers in determining the progress of a specific job.

There are a few steps that a company can introduce that will help create an environment of accountability among the different team members.

- 1) The foreman or superintendent must provide daily or weekly production reports and time cards on a timely basis – this responsibility is non-negotiable. Ideally, the information will be provided in either a hard copy format based off of the systematic electronic version of the same information or, with the advances in technology, gathered and submitted in a compatible electronic format back to the office.
- 2) Some form of periodic production meetings (once a week, every other week or once a month), must take place between the project managers and the owner(s) and/or the leadership team. During these meetings, cost reports should be analyzed and then compared to the budget or the original estimate. The prior meeting's production reports may also be analyzed. A conference line can be setup for the foremen or the superintendents to have direct communication for these meetings if they are unable to attend in person.
- 3) The accounting department must perform a monthly "soft close" of the books. This entails at a minimum making sure that cash reconciles and all costs are posted to the jobs – subcontractors, payroll, fringe, materials, etc. The accounting department must also make sure that the bills go out in a timely manner to ensure cash flow does not lag. Then the WIP schedule must be updated with the new information and reconciled back to the income statement.

The owner(s) of a closely-held construction company are often out of the office and in the field, but the culmination of all jobs is reported on the company's financial statements – not just the current top project. In fact, those owners that prefer to be in the field often place a lower priority on their financial statements, but this may be the most crucial part of running the business. Your working capital, equity, and income are what drive your bonding program as well as the relationship with your bank. After these three steps are accomplished, the business owner(s), and/or a trusted leadership team, needs to analyze the financial statements to see where the business is trending. Projects that have an indication of potential profit fade should be further analyzed and plans should be devised to address the situation.

Demonstrating the competency of the owner(s) and the leadership team is essential in building and preserving the relationship with the company's bonding agents and the financial institution. This competency must also be established throughout the company by implementing proper processes and procedures. A company that shows a unified approach to prevent profit fade will often be viewed favorably by its external business partners.

Matt Nowaczynski is a Certified Public Accountant and manager at Clifton Larson Allen (formerly KFMR). He can be reached at Matt.Nowaczynski@claconnect.com. 



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Legal Perspective

Implied Warranties as to the Plans and Specs on a CM at-Risk Project

By Scott D. Cessar, Esq.



In a traditional design/bid/build project, the owner retains the architect/ engineer to design the project and, once the design is complete, puts it out to bid. As such, the owner, pursuant to the Spearin Doctrine, impliedly warrants the constructability of the plans and specifications. If the contractor relies, in good faith, on the plans and specs, the contractor will be entitled to recover additional costs arising from design defects.

In a CM at-Risk project, the owner engages professionals to design the project and, in addition, hires a CM (contract management) firm to provide a range of preconstruction services. These preconstruction services may include cost estimation, design review, value engineering and preparation and coordination of the bid packages. The CM firm then serves as the general contractor holding the subcontracts, directing the work of the trade contractors, and providing management and construction services.

This distinction in project delivery systems raises an interesting question: Does the extensive preconstruction involvement by the CM at-Risk in the design of the project eliminate the implied warranty of the plans and specs by the owner under Spearin?

The question was considered in a recent case from the Supreme Judicial Court of Massachusetts in *Coughlin Electrical Contractors v. Gilbane Building Company v. Division of Capital Management and Maintenance (DCAM)*.

Coughlin arose from a CM at-Risk project administered by a Massachusetts state agency, DCAM, for the construction of a hospital. DCAM hired a designer to design the hospital. Gilbane served as the CM at-Risk for DCAM. *Coughlin* was the electrical subcontractor to Gilbane.

Coughlin filed suit against Gilbane alleging a 49 percent labor hour overrun based on Gilbane's alleged failure to schedule and coordinate the project and based on alleged design defects, including a discrepancy as to the amount of space in the ceiling to place the electrical work and a claim that design changes prohibited the work from being done in a logical order.

Thereafter, Gilbane joined DCAM to the case alleging that, if there were design defects, then DCAM was responsible based on the implied warranty of constructability of the plans and specs.

The trial court dismissed Gilbane's joinder of DCAM because the CM at-Risk method results in "material changes in the roles and responsibilities voluntarily undertaken by the parties," which extinguishes the owner's implied warranty of the plans and specs. Stated another way, the trial court concluded that Gilbane's consultation and involvement with the design as part of its preconstruction services immunized DCAM from liability for subsequently discovered design defects.

On appeal, the highest court of Massachusetts reversed the lower court and held that the owner in a CM at-Risk project may have liability for design defects based on a breach of the implied warranty of constructability of the plans and specs.

The court held that, although the relationship of the CM at-Risk and a general contractor in a design/bid/build project is substantially different, this, in and of itself, does not constitute grounds such that the CM at-Risk bears all responsibility for design defects and the owner none. The owner may or may not have accepted the CM at-Risk's design suggestions as to the plans and specs. The owner also engaged a designer to prepare the design and may be able to transfer liability to the designer. Further, and importantly to the court, the contract between Gilbane and DCAM did not contain any express waiver of the implied warranty.

Based on these considerations, the Massachusetts high court reversed the trial court and sent the case back to the trial court. At trial, Gilbane will be permitted to attempt to prove a breach of the implied warranty by DCAM. The greater Gilbane's design responsibilities and involvement during preconstruction, however, the greater Gilbane's burden will be to show that it reasonably and in good faith relied on DCAM's design.

For Gilbane to recover against DCAM on Coughlin's claims, Gilbane will, therefore, likely need to show that the design issues raised by Coughlin were not something that Gilbane, in good faith and in the reasonable exercise of its preconstruction services duties, would or should have discovered.

Coughlin, thus, teaches that determining liability for design issues, in most situations, will not turn on labels like "CM at-Risk." Instead, the determination will turn on a careful review of the contract clauses at issue and the facts as they relate to the particular design defects that serve as the basis of the claims.

Further, Coughlin suggests that owners in a CM at-Risk project would be wise to contractually disclaim the implied warranty of constructability of the plans and specs with a carefully worded clause in which the CM at-Risk acknowledges that, based on its extensive preconstruction services, the CM at-Risk has satisfied itself that the design is sound and is buildable in all respects.

Scott D. Cessar is chair of Eckert Seamans' Construction Practice Group. He can be reached at scessar@eckertseamans.com.

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Management Perspective

What Follows a Cracker?

Now what?

In the days following the June 7 announcement by Royal Dutch Shell of its final investment decision to build an ethane cracker near Monaca, there was relief and euphoria. There were also a lot of business people asking that question.

At least 99 percent of the companies involved in the construction industry in Western PA will not be working on the Shell polyethylene complex during the next five years, either by design or because of resume. For those businesses it's reasonable to question what other development and construction will come along behind the Shell facility. Going back to the earliest days of the Marcellus Shale exploration, companies like Range Resources took pains to point out that the real benefit to the economy will come from the downstream activities. Now that those downstream activities look like a reality, what will that look like?

The answer to the question lies partly in the rationale for the cracker plant. Shell will be taking ethane and chemically reforming components of it – or cracking it – to produce polyethylene, ethylene and other byproducts. Most of what is produced when the plant opens will be in the form of polyethylene pellets. Crackers like this exist elsewhere – primarily in the Gulf Coast – but the cost of transportation and the savings in using natural gas instead of oil, justifies the enormous capital expense of building the plant in the heart of the largest gas deposit in North America. The savings in using natural gas where it's located to make polyethylene is further

justified because 70 percent of Shell's customers lie within a 700-mile radius of Pittsburgh.

So the short answer is that the plastics industry should see the Monaca plant as a magnet, especially if PTT also proceeds with its plans to put a smaller cracker on the Ohio River 30 miles or so southwest of Shell's project. When you get into the weeds of the issue, however, it is a little more complicated.

First, there is a big difference in the infrastructure supporting the industrial chemicals in the Gulf or Houston compared to Western PA. In Houston, for example, a pipeline grid exists that is dedicated to ethylene. Much like the electric grid or potable water system, the ethylene pipeline receives supply from refiners constantly and users of the building block chemical for plastics and other industrial products draw from the grid as they need it. Ethylene isn't delivered. Users turn on a valve in the grid.

After investing billions in a new chemical facility, Shell will mostly be producing plastic pellets.



Plastic manufacturing is a multi-step process that is varied depending upon the shape and character of the item being made. Bottles are molded. Pipes are extruded. Plates or caps are formed from film. Depending upon the size of the manufacturer and the market being served, the process of making the

finished plastic product may be vertically integrated. When that doesn't make economic sense, manufacturers buy their shaped products from polyethylene convertors. Those companies take polyethylene pellets and melt them to make the materials that manufacturers can then mold, form or extrude into finished products. Polyethylene convertors make high density and low density polyethylene sheet, film and injectible plastic. In the plastics customer base, the polyethylene convertor is the most likely prospect for locating in Western PA.

Another wrinkle in this commercial puzzle has to do with shipping. Finished plastic products are more air than plastic so shipping finished products is unwieldy unless a manufacturer is shipping to the final buyer. Sending truckloads of plastic bottles to a distributor makes no sense, unless the distributor is filling the bottles with something. So, makers of finished plastic goods aren't going to be more attracted to Western PA simply because Shell is making polyethylene pellets here.

According to Shell Chemicals spokesman Michael Marr, the Monaca plant will produce both low-density polyethylene (for use in making flexible plastics for film or cable) and high-density polyethylene (for rigid plastics). Even though the site is attractive to Shell for proximity to customers, the logistics of the plastics market may not entice many – or any – of its customers to move to the tri-state area.

"Our customers will be closer to the end user than most of Shell Chemical's other customers," Marr predicts. "In many instances, they will be one step removed from the customer. They will take our products and convert them into the types of products their customers need."

The Northeast U.S. and Canada Petrochemical Construction Conference, which was held in Pittsburgh on June 27-28, provided some insight as to the potential downstream impact of the cracker. Honeywell's Joe Zimmerman presented an in depth look at the chemicals produced during the ethane steam cracking process and pointed to a number of byproducts that would not be used by the plastics industry. Such chemicals would be the feedstock for fertilizers, pharmaceuticals and other industries outside plastics. Like Shell or PTT, other chemical manufacturers would then refine the byproduct chemicals from the ethane cracker to produce the basic chemicals used in the other industries. Zimmerman's estimate was that such chemical plants would be smaller than a cracker but would still be multi-billion dollar investments.

David Ruppertsberger, president of the Pittsburgh Regional Alliance (PRA), was equally cautious about how attractive Southwestern PA will be to Shell's downstream customers, especially since he says the PRA has not yet sat down with Shell to have such a conversation. He is quite bullish about the opportunities for the long-term supply chain.

"There are industrial gases and other chemicals required for the cracking process. The suppliers of those may or may not already be local," he notes. "There will also be what they call turnaround companies. They are in the business of taking equipment from the plant out of service and refurbishing it

or updating the technology. These are businesses that will be needed constantly for as long as the plant is operating. Ideally, they will be in close proximity to the plant."

Companies like Ruppertsberger describes are examples of an industrial supply chain that barely exists in Pittsburgh. There will obviously be a significant increase in the businesses that supply hospitality and other services or consumables to the plant – not to mention a second or third plant in the region. While it's unlikely that the Appalachian Basin will end up with a gas and chemicals infrastructure like Houston's, it's very likely that what will result from the full development of the potential for the natural gas supply will reshape the region.

"It's too early to really know how this will develop over time," says Ruppertsberger. "We know it's going to be big. We just don't know how big."

The question of where projects will develop is as intriguing as what businesses will locate here. For manufacturers, there is a regional shortage of large sites that meet the ideal requirement of access to river, rail and interstate highway. For users of 100 acres or more, in fact, there are only four that are prepared to develop. One of those, on C. J. Betters Enterprises' property in Aliquippa, may have been taken by Shell for parking and a 200,000 square foot warehouse. Betters has other sites in Aliquippa and Midland, and the Mon Valley Industrial Park in Allenport also has sufficient land to accommodate a big user. Montgomery Dam LLC owns 125 acres near the Shell site, but plans for the property don't include a single plant and the site is not pad-ready.

Assuming that most of the manufacturers and suppliers that will be attracted to Western PA will have smaller requirements, the hot spots for development will follow the I-376 corridor and the I-79 corridor where access to I-376 is convenient. That will give a boost to the Cranberry area and especially to the property near Southpointe, which should have an interchange connection to the completed Southern Beltway by the time the Shell project is done.

In the areas with the closest proximity to the plant there currently aren't many development-ready properties. Expect that to change quickly over the next few years. Officials in Beaver County and Lawrence County have the opportunity to expand the inventory of pad-ready land and the location of the Shell plant should be a draw for state and federal economic funding. Budget battles in Harrisburg make Beaver County officials pessimistic about their ability to do large-scale projects.

Assuming that most of the manufacturers and suppliers that will be attracted to Western PA will have smaller requirements, the hot spots for development will follow the I-376 corridor and the I-79 corridor where access to I-376 is convenient.

"Our development model is that we put cash into the project and borrow the rest. We sell the projects to recover our equity," explains Jim Palmer, president of the Beaver County Corporation for Economic Development (BCCED). "We do projects that cost more than they are worth at the end. We need state grants to make up that gap."

Palmer notes that the most likely properties – Hopewell Business & Industrial Park, Aliquippa Industrial Park, West Gate Business Park and Betters' parks in Aliquippa – have already been prepared to a large degree. He says BCCED will be focusing on preparing for smaller developments, in part because of the uncertainty of support from Pennsylvania.

"Our three sites and Betters' sites will all be improved to be better sites in the next few years," says Palmer. "We're looking for 10-20 acre sites for future development."

One potential source for cheap, patient capital is the Power of 32 Site Development Fund. Much of the Power of 32 Site Development Fund's \$49 million in capital is available for investment, according to Josh Lavrinc, fund manager for Callay Capital, which manages the Power of 32 Fund.

"I don't know that we can take credit for having funds set aside for sites near the cracker site," says Cecilia Cagni, senior

vice president of marketing/communications for the Allegheny Conference on Community Development and for the Power of 32. "There had been an identified need for larger pad-ready sites as a competitive issue. As the [Power of 32] fund managers analyze loan applications, they are weighing factors like the site location. If someone has a site close to the cracker site, that would be a factor in their favor."

Regional economic development leaders and private developers will certainly be in high gear in their business attraction efforts in the coming year or two. Most of the work done to provide Shell with enough information to make a positive decision about Western PA had been done for some time and the last year or two has been mostly a waiting game for those charged with bringing business to the region. With the decision made, economic development officials can begin to look to the new deal in earnest.

Jim Palmer jokingly demonstrated that attitude on June 7 when a newspaper reporter called him to ask about the impact on Beaver County. "I asked him why he was interested in the Shell story," Palmer laughs. "I said, that's yesterday's news."

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MBE/WBE Company Spotlight



The new management team looked to broaden the base of business. They did sign maintenance, managing the signs for all Eat 'n Park restaurants in Pennsylvania, West Virginia and Ohio. They also provided those services for a number of McDonald's franchises, as well as KFC, Arby's and Taco Bell. ImbuTec provided labor for utility services companies, from general laborers to highly skilled technical workers. And the company expanded into the LED lighting business in its early stages, doing the work at the Allegheny County Jail and Pittsburgh International Airport, which were among the largest installations in the U.S. at the time.

Richard W. Taylor, CEO of Imbu Technologies (ImbuTec) has become adept at the art of making lemonade out of lemons. A corporate attorney in the energy industry, Taylor has been running ImbuTec since 2009, taking a company that could have gone into bankruptcy at the time and leading it into a broader-based specialty contracting business. Asked how he chose to take on his role in the construction industry, Taylor is both succinct and self-deprecating.

"I was a dumb investor," he laughs. A few years earlier, Taylor had begun investing in real estate and several friends had started a company that he thought had potential but it didn't turn out as planned.

"I bought into their vision and wanted to support what they were trying to do. The initial focus was on energy efficiency in industrial and commercial buildings, particularly in multi-family residential properties," he recalls. "The original management team didn't do a good job of executing that vision.

"Ultimately, I and my best friend, who had also come in as an investor, had to step in and take the reins of a business that should have been taken into bankruptcy. We didn't take it into bankruptcy because a lot of the major creditors were owed money because of our involvement. I didn't feel it was right to discharge the obligations."



Richard Taylor

ImbuTec seemed to be on a growth path but the Great Recession exposed weaknesses that brought Taylor from investor to manager.

"As the downturn hit, what we found was that anybody who had cash was holding it. No one was making investments in facilities. It put us in a very difficult position," he notes. "If we had stayed in the energy efficient lighting niche, we definitely would have died. Not that we didn't almost die anyway; it was just a very, very tough time. We really looked at what our experience had been, what was our profile? Rethinking who you are changes what you do. Rather than thinking of ourselves as an energy efficient lighting company we focused on what in effect we had been doing."

Taylor looked closely at the financial performance of the services ImbuTec had been providing and was concerned that the margins in the sign maintenance business were too low. He believed that the risks of the industry weren't being reflected in ImbuTec's bidding and sales. Consolidation in the utility business had eliminated the need for its labor support. Where he saw opportunity was in growing the energy efficient lighting installation services.

"We'd been doing electrical construction work. So we began to go to market as an electrical contractor and then seized opportunities to broaden from electrical construction to more general construction. We've begun to grow in a meaningful

“We’ve really seized on leveraging that opportunity. We’re getting very positive feedback from very demanding customers, the kinds of customers who really insist on first-rate performance, like the Navy and Army Corps of Engineers,” Taylor says with pride.

way,” he says. “We’ve gone through the journey and now are applying the hard-learned lessons, understanding the things we are able to do.”

Taylor credits the Small Business Administration’s (SBA) 8(a) Program with helping him get the tools needed to grow ImbuTec. The company was paired with a mentor organization, which had previously been through the 8(a) Program. The SBA program also gives access to federal contracting opportunities, which ImbuTec has pursued to land work in a number of facilities around the U.S. One area of specialization that has been successful for ImbuTec is the installation of mass communication and notification systems. Those systems allow for communication with everyone on a military base through multiple media within 15 minutes of an incident. That work has taken ImbuTec from Idaho to Puerto Rico.

“We’ve really seized on leveraging that opportunity. We’re getting very positive feedback from very demanding customers, the kinds of customers who really insist on first-rate performance, like the Navy and Army Corps of Engineers,” Taylor says with pride. “Part of our strength is our focus on safety. We have a full time safety manager with a degree in safety management and industry experience. We have no claims over the past three years. I view safety as not only the right thing to do for our employees and the public, but it’s also a quality control measure. If you’re performing a job safely, you’re more likely than not doing the job right.”

Although ImbuTec has worked across the continent, it is trying to expand its business within its core market areas, which are within a four-hour drive of Pittsburgh and Harrisburg. The firm has an office staff of four people and has signed agreements with the unions representing the electrical workers, laborers, operating engineers and painters. Taylor sees great opportunities for ImbuTec

within the corporations located in Pittsburgh, as more companies look to diversify their supply chain.

Richard Taylor has warmed to the challenge of turning ImbuTec into a growing company. He has a history of taking on daunting challenges.

Raised in Baton Rouge, LA, Taylor became active in public policy at age 15, lobbying for education reform and drafting legislation to create a seat for a student on the state’s board of education in Louisiana. Taylor was elected youth governor of Louisiana and governor of Louisiana Boys State, the first time one person had held the top position in both of those leadership development organizations. His interest in politics landed him an internship with U.S. Sen. John Breaux (D-LA), which led to work as a lobbyist for Consolidated Natural Gas (CNG) in Washington, DC. That was work that helped fund his college education.

At Georgetown University he was nominated for a Rhodes scholarship, for which his mentor was the Arkansas governor and fellow Georgetown alum, Bill Clinton. Taylor later volunteered on Clinton’s presidential campaign. He earned a law degree from Tulane University and clerked for Judge James Dennis on the U.S. Fifth Circuit Court of Appeals before returning to the energy business and Pittsburgh. He’s active in the redevelopment of the Hill District and serves or served on the boards of the Port Authority, the Pennsylvania Environmental Council, Macedonia Development Corporation, the Urban League and the August Wilson Center. Taylor’s civic involvement is something that he doesn’t intend to dial back.

“Most people who know me in Pittsburgh have no idea what my day job is,” laughs Taylor. “Civic engagement is something that’s important to me. My mother instilled in me that to whom much is given, much is required. If you shy away from difficult challenges, who is going to take it on?” **BG**

COMPANY FACTS

Imbue Technology Solutions Inc.

Richard W. Taylor, CEO

rtaylor@ImbuTec.com

920 N. Lincoln Avenue

Pittsburgh, PA 15233

T: (412) 322-8832

F: (412) 322-1130

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Marketing to Your Clients When Business Slows

One of the more delicate balances in marketing is the allocation of resources for maintaining customers versus attracting new ones. The math has always been pretty simple: it's much less expensive to keep a customer than to gain a new one. But what happens when your good customer has no work?

In Pittsburgh, three of the industry segments that have fueled the economic recovery since 2009 have seen cyclical downturns during the past two or three years. As Pittsburgh took curtain calls for its robust and diverse economy in the early part of this decade, the phrases "eds and meds" and "Marcellus Shale" were on everyone's lips and in everyone's marketing budget. It wasn't hard to find money to support business development in energy, healthcare or higher education construction. If you were doing business with UPMC or Carnegie Mellon or Range Resources (just to name a few), you found the cash to buy lunch or sponsor an event that was important to those clients.

Business cycles don't pay much attention to marketing. Oil and gas prices plunged in late 2014. Demographics and tighter funding caught up with higher ed. The Affordable Care Act and the intense competition between UPMC and Highmark whacked healthcare spending. With all three of these major construction drivers in a cyclical downturn at the same time, companies that served those sectors have been scrambling to react to the loss of business.

Construction is a cyclical business and its sub-sectors almost always experience cycles within cycles. The temptation may be to shift focus and resources to those sectors that are busy but owners in slow markets still need service and service providers are well-advised to keep providing those services, even as they look for other opportunities.

"You have to expose yourself to what markets are available. That may mean I have to bid smaller work that our customers are offering in order to maintain good relationships with those clients," notes Bernie Kobosky, director of business development for PJ Dick Inc. "You can't pivot away. You're still resume-dependent upon the work that's available in those markets, albeit on a smaller scale."

The healthcare market is a big component of PJ Dick's resume. With that segment in the doldrums, there has not been another Children's Hospital or UPMC East in a while (although a UPMC South may be in the offing for 2107). Any work at the region's hospitals has been earned through very competitive hard bidding. Kobosky says that taking the foot off the gas in marketing to the healthcare industry hasn't been an option.

"Healthcare is down but we don't want to stay out of that market, but rather react to other markets," he says. "Multi-family wasn't something that we did five years ago, for example, but we have adapted to that market. We work for a developer in Walnut Capital that owned apartments but hadn't developed them. We both learned about the market as the projects developed. I think you have to have a flexible workforce, and I mean as much behind the scenes in estimating and project management. Sometimes adapting means going into other markets."

"It helps that we're looking at the global market not just the Pittsburgh market," agrees Mark Witouski, vice president, client relations and development at CH2M. "In Europe we have several projects on [college] campuses and in several states in the U.S. There is work, just not as much. We're also focusing on STEM projects, which are on an upward path. A lot of that will be renovations rather than new buildings but, believe it or not, there are a few major science and research buildings out there."

Asked if CH2M considered putting more of its resources into other market segments, Witouski replied, "No. In all circumstances we went further away rather than changing the kind of work we do. We had to get out of our comfort zone in Pittsburgh."

There is something of a distinction to be drawn between public and private construction when it comes to the subject of changing course, as well as a difference between contractors and designers. For prime contractors doing public construction, it's more feasible to switch gears and chase the hotter markets. The preponderance of public work is prequalified only by the ability to bond the project so even without much experience within a type of construction contractors are able to bid work. For designers, the resume is the main qualitative differentiator. The same is true for contractors and subcontractors in the private sector. In cases where relevant experience is a key factor, firms have a vested interest in pursuing work that their resumes support.

Higher education clients make up a significant portion of Volpatt Construction's resume as well. The company's president, Ray Volpatt Jr., says he didn't spend a lot on marketing prior to the recession but the reduced capital spending by colleges and universities made him become more proactive about marketing. He also notes that having Volpatt Construction's eggs in more than one basket helped too.

"Did we know that education was going to slow down? To some extent we did," Volpatt acknowledges. "We try to be diverse enough that if one of our markets turns down, another will pick up to help recover the revenue."

Volpatt notes that his company went through a period of a few years when it had no work with the Catholic Dioceses but as higher ed work slowed, Volpatt Construction landed projects at several parishes and Catholic facilities. He also is quick to point out that his luck in the college market has been pretty good in spite of the downturn. "You may want to ask somebody else about that market," he joked.

Sheldon Goettle, partner at PWWG Architects, makes the point that maintaining relationships requires consistency, even when it's obvious that repeat clients don't have work to do. Higher education is one of PWWG's principal market focuses and Goettle says the firm isn't looking to other sectors, only to return when times get better.

"We want to stay in the higher education market because buildings wear out and programs change. There will always be some need our clients will have for our services," he says. "You're dealing with institutions that are determined to survive. They want to be around in another 50 years. When things get better, we don't want to knock on their door and say we're back."

Buyers, whether they are CEO's or procurement officers, are also people with human emotions. Those can vary from ego-mania to anxiety but most people responsible for choosing an architect, engineer or contractor don't want to feel ignored. Showing up only when a customer is busy gives the impression – probably accurately – that the relationship is mostly one-way. Given the high level of competition in Pittsburgh's construction market, ignoring owners seems like an unlikely choice.

"Actually, I think they tend to get more aggressive when things are slow," observes John Krolicki, vice president of facilities and support services at UPMC. "When things are really busy we find that there may be fewer people knocking on our door doing business development. When things slow down we see a lot of companies, including firms we've never even heard of."

Krolicki acknowledges that UPMC's construction volume, which averages about \$300 million annually, is hard to ignore.

"When business gets slow in other industries we get more inquiries because people know we're still going to have work," he says.

Of the three major market segments currently in the doldrums, the oil and gas industry is the one that might be seen as having more one-way relationships. The industry worked hard at finding contractors and suppliers that could perform consistently as it grew, meaning gas industry buyers would want to keep those vendors close until business picked up. Moreover, gas industry developers and service providers like Halliburton – which was explicit in writing to its supply chain about expectations of a 30 percent overnight price cut – responded to the slowdown by showing less concern about relationships than price. Still, smart vendors are not taking chances about neglecting good customers.

"Trumbull Energy has seen an incredible decrease in our core services of providing well pad construction," admits Tim O'Brien, president of the Trumbull Corporation group that was started to support the gas industry. "[But] we feel strongly about maintaining the energy customers we worked really hard to get and to gain confidence in us. We maintained our membership in the Marcellus Shale Coalition. We haven't stopped spending on DUG East and other Marcellus and Utica Shale conferences. It's all about looking long term."

O'Brien's comments cut to the heart of the dilemma with these three market sectors. Oil and gas companies, universities and hospitals all have a long horizon when it comes to their capital assets. As owners, they appreciate service providers that look to have long-term relationships but that's a challenge when dealing with short-term resources.

Whether the remedy to a slow market is to look in a bigger geographic area or to court new clients, the effort will almost certainly require more resources. Slower markets usually mean less revenue and, therefore, fewer resources to invest. It takes fiscal courage to spend more when revenues are down but that often is the course that will result in success in attracting new customers. There is really no getting around the fact that resources will be needed to add new business. The balancing act is between spending more and diverting spending from existing clients.

That's a balance that challenges business owners because most don't want to see their business as choice between new or existing clients. It's not an "either or" proposition.

"We have to focus in other places but still maintain the relationships with higher education and healthcare," asserts Volpatt. "They are still long term clients." **BG**



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Trend to Watch



What's the Trend in Student Housing?

For 15 years there has been a renaissance in how colleges provided housing for their students that snowballed into wholesale changes in student residences across many campuses. In an effort to match the expectations of the prospective students, colleges recognized that the concrete block bunkers that were good enough for generations of college kids weren't cutting it anymore. What replaced those institutional dormitories were residence halls that more closely resembled private apartments.

As with most American trends – especially those that have a real estate component – things got a little carried away. As enrollment at four-year colleges stagnated and decision-making moved more towards price again, it became clear that the upscaling of student residence halls was not a one-size-fits-all solution to recruiting. Yet, even as many colleges and developers struggle with vacant rooms, the trend towards better accommodations has continued towards luxury dorms, at least on a limited basis. And since 2013, student housing has been viewed as a category of commercial real estate by investors and developers, pushing construction of new residence options higher.

In Pennsylvania, a model developed that allowed the PA State System of Higher Education (PASSHE) to participate in the construction of new residence halls without the financial burden of first costs or ownership. Using the authority to issue bonds, foundations and student associations at PASSHE schools engaged private developers to build large-scale projects in the early stages of the student housing boom. At Indiana University of PA, the university replaced all of its aging dorms with new apartment-style residence halls.

Within the PASSHE system, some of the early adopters have seen the privately-developed projects mature and come onto the books of the universities. At California University, the non-profit arm of the student association owns the 860 units of apartments built about a mile west of campus, while the university recently purchased the 1,500 units of apartment-style residence halls on campus, taking out the developer's loan with what was much cheaper debt.

Cal's facilities department has been maintaining the residence halls all along, regardless of the ownership. Built to replace

all of California's dormitories, the newer residence halls were residential in construction rather than institutional. There are maintenance issues as a result.

"You could certainly build them a lot cheaper that way," says Mike Peplinski, director of facility management at California University. "But you get what you pay for."

Enrollment boomed at California University during the 2000s, when the apartment-style residence halls were built, but the number of students enrolled has fallen off slightly in recent years. Lower enrollment has plagued many of the PASSHE schools over the past few years, although Slippery Rock University has been bucking that trend over the past three years. Scott Albert, director of facilities at Slippery Rock, says the solid enrollment numbers have helped keep occupancy at the university's residences full.

At Slippery Rock, the university's non-profit foundation also undertook a massive residence hall program about ten years ago, using a private developer to build 2,150 beds of apartment-style residences at the eastern edge of the campus, within close proximity to the athletic fields and new student center. Albert says that the university manages and maintains the residence halls on behalf of the foundation, which has recently taken advantage of low rates to refinance the project. Slippery Rock University also owns and maintains dormitories with 700 beds.

Although there are still a few thousand private apartment units throughout the town itself needed to meet the needs of the total enrollment, Albert says the university has no plans to add more on-campus housing. Increased inventory of private apartments over the past decade has created vacancy problems that the university does not wish to fight.

"The board made a conscious decision to cap beds at 2,800," he explains. "Someone builds a new complex and students flock to it to try it out. The next year occupancy goes up. I have had developers call with interest about doing projects near campus. My response is always that our market is oversaturated."

With an undergraduate enrollment of just under 8,000 students, Slippery Rock is a size that is in between the two extremes of the current housing market. By keeping its own inventory of beds at roughly one-third its enrollment, fluctuations in enrollment shouldn't negatively impact the occupancy of its residence halls. At the same time, the university



The SkyVue Apartments in Oakland will be the first of three major projects adding over 900 dwelling units in close proximity to the University of Pittsburgh. Image courtesy Massaro Construction Group.

is too small for the sweet spot for developers of the student residences that are successful today. Like with most hot real estate trends of the mid-2000s, student housing development was treated like there was no project that could fail. The perception was that the students of that day – those we now know as Millennials – could be swayed by better amenities rather than better tuition rates. The arms race that ensued left winners and losers. Today's projects are viewed with more scrutiny.

"It's definitely property-specific now," observes Paul Griffith, president of real estate services company Integra Realty Resources. "The state system schools have been impacted substantially more than West Virginia University or Pitt. There was a ton of private off-campus housing done at Slippery Rock after 2005. We just did a foreclosure appraisal on one of the last ones built there. It was the furthest from campus and after the recession, with declining enrollment, occupancy fell too low."

Griffith says that the 70 percent level is something of a tipping point for viability in private apartments. He's also quick

to point out that the proximity to campus has been the biggest determining factor, noting that the private university-sponsored projects at the PASSHE schools have fared well. Griffith noted that Indiana and WVU have not seen problems, even though additional product has been delivered since the slowdown.

"The products being delivered at WVU are all walkable to the Downtown campus. Apartments that are located where students have to drive to campus are definitely seeing softer rents," Griffith says. "It doesn't matter how nice the units are, if it's far from campus students are choosing to be elsewhere."

What Griffith observes is not a regional phenomenon. Michael Orsak, senior vice president of investments for Austin-based Campus Advantage, says walkability is a key component to success in current housing projects.

"What we're seeing is higher density. The projects are pedestrian-friendly infill projects," Orsak explains. "What was developed before was what was easiest to entitle and build. That led to a lot of three-story garden apartments built on

easy sites. Now we're building close to campus so students don't have to have cars to live there."

In Pittsburgh, Campus Advantage is working with Massaro Corporation and Desmone Architects to get started on a 295-bed mid-rise at 3407 Forbes Avenue in Oakland. The project will serve Pitt students looking for an alternative to the hundreds of adapted single-family rentals scattered across South Oakland. Campus Advantage will also compete with two other private developments, both coincidentally being built by Massaro. The 389-unit SkyVue Apartments are nearing completion one block to the west on Forbes Avenue. RISE Real Estate (formerly Ambling University Development Group) is the owner. And at the corner of Craig Street and Centre Avenue, Park 7 Group has proposed a 326-unit apartment called the Empire. In all, these new projects will offer an upgraded lifestyle to more than 2,000 students.

The current trend towards density isn't unique to urban campuses like Pitt's. Orsak says demand for more dense development is widespread and driven by campus size instead of urban proximity.

"There is urban-like development in college towns across the U.S. as long as enrollments are 25,000 or more to make the numbers work," he says.

It was lifestyle that sparked the shift in student housing two decades ago. Universities were justifiably focused on academics rather than housing as college enrollments boomed in the 1960s and 1970s. Additions to the inventory of dormitory beds lagged the growth rate of students considerably, leaving the majority of students to fend for themselves in finding housing in their last two or three years of college. Around most college campuses those unequal supply and demand dynamics created a cottage industry of private off-campus housing that was quite varied in quality. That created an opportunity.

"Off campus student housing derived from market demand," explains Orsak. "Universities only provided housing for freshmen, or about 25 percent of their enrollment. As student demand started changing in the 1990s, private developers began to respond by building purpose-built student housing. Students wanted professionally-manage apartments. They didn't want to join up with three other classmates and sign a full-year lease in a single-family home."

Prior to 1996, fewer than 10,000 off campus beds were delivered in a given year. Over the next five years the number of beds built steadily increased to more than 30,000 in 2001. A new high of more than 40,000 beds were delivered in 2008 before the recession tamped down construction. Universities saw significant changes in how students viewed higher education after the downturn, yet construction of off campus residence halls bounced back above 40,000 beds again in 2012 and spiked higher to 60,000 beds in 2013 and 63,000 beds in 2014.

The latest boom in student housing has some of the same demand characteristics but it has been commercial real estate investors driving development as well. Appetite for yield and an appreciation for the fundamentals of off-campus residence projects appeals to investors growing more leery of other real estate categories. Pre-leasing at new apartment-style developments topped 95 percent in August of 2014 and 2015, with occupancy topping 96 percent by November of each year. Recognizing the category had heated up, developers pulled back below 50,000 beds in 2015, allowing demand to catch up to the supply.

It's clear from where the major projects are being planned that student housing developers are targeting large university settings where opportunities to build close to academic facilities and amenities exist.

There have been lessons learned from the earlier private student housing boom that are being applied in the developments of 2016 and beyond.

Private bedrooms and bathrooms were an important component of the earlier developments but schools discovered that students became more isolated in that kind of arrangement. Today's designs are trying to foster community on campus and students are responding positively to the trend. Within the residence halls, more resources are being put into building larger common spaces that offer chances to collaborate and play together. Hand-in-glove with that trend is a move towards smaller rooms. Like with current multi-family designs, the trend towards smaller rooms that serve mainly as sleeping quarters helps push students to the communal spaces.

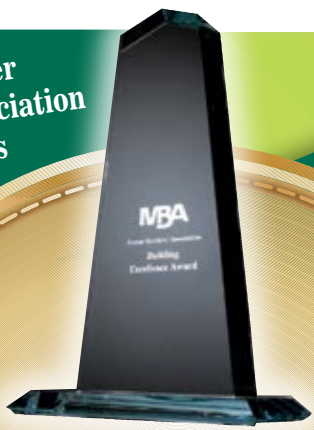
Another trend that is still early in its development is that of designing learning spaces within the residence halls. By designing flexible multipurpose spaces within the residence halls, universities can blend guided learning that is traditionally done in classrooms into the spaces where students live. This concept of "residential college" brings academics and residential life together, allowing universities to accomplish their missions in less space.

Since the economic recovery began, there have been pressures on colleges and universities. Construction and development on campuses has been less speculative. Many institutions were saddled with financial lingering difficulties that had to be reversed. Many observers believed that campuses – and the students' residence options – would become more austere again. But what drove the development of apartment-style residence halls in the first place is still the driving factor in 2016. Competition for students has not diminished and there is every indication that colleges will have to continue to find differentiating factors to keep enrollments steady until the next demographic wave boosts all higher education.

Regardless of what future student residence trends appear, your old concrete block dorm room won't be coming back.

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INDUSTRY & COMMUNITY NEWS

ACE Mentor Celebrates 2015-2016 Year

On Wednesday, May 18th, the ACE Mentor Program of Western Pennsylvania hosted Celebrate ACE 2016 and recognized five local area high school students with college scholarships. This year's recipi-

ents were: Vincent DeRienzo from Peters Township High School, David Kuenzel from Charleroi High School, Jeffrey Lang from City Charter High School, Dylan Serena from Peters Township High School, and

Louis Suarez, who was home schooled. Celebrate ACE 2016 is an evening gala to recognize the accomplishments of the high school students and mentors for its successful 2015-16 school year.



Participants in the ACE Mentor program made year-end presentations to the public at the Keystone+Mountain+Lakes Regional Council of Carpenters Joint Apprenticeship Training Center.



In recognition of the safety app, Harness Hero, which was developed by the Master Builders' Association and Simcoach Games, the City of Pittsburgh declared May 3 to be Harness Hero Day. The MBA's Safety Director Bob McCall, Jessica Trybus, Simcoach CEO and Councilman Dan Gilman (right) accept the recognition of Pittsburgh City Council.



On Friday, April 29, the associates at The Hayes Design Group - Architects celebrated National Arbor Day by volunteering at one of the most recognized landmarks in the world, Fallingwater in Mill Run, PA. The day of service was the inaugural event of the firm's "Adopt-a-Landmark program."

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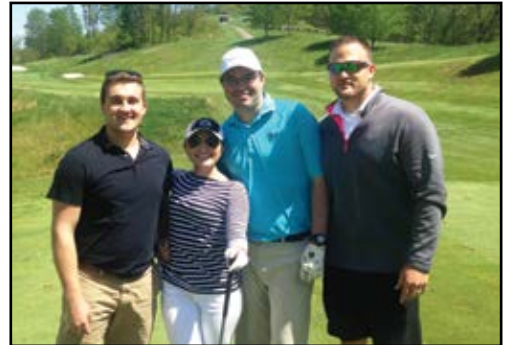
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Janet Cooley, art teacher at Paynter Elementary School in Baldwin-Whitehall School District and the MBA's Jon O'Brien with MBA Kids Art winners (from left) Avesia Mantia, Billie Rose Pavlik and Ava Frantz.



Michael Larson-Edwards, (left-to-right), Josh Douglass, Zak and Jake Roberts from A. Martini & Co.



(From left) Brian Budny and Tara Noland from PJ Dick, Tom Miller from RSH Architects and Chad Chalmers from Wildman Chalmers Design.



(Left-to-right) Jim Ferry II, Jason Berger from Graybar Electric, Ferry Electric's Bill Puhlman, Graybar's Jeff Vaders.

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Babst Calland's Jim Miller (left), Brayman's Chris Schriener and Brian Hawk, with Zach Rosswog from Advantage Steel (right).



Retired Penn Hills YMCA Executive Director Jay Hope (left), with Burchick's Dave Meuschke, Joe Wardman and Joe Scaramuzzo.



(From left) Ray Vogel and MBA Executive Director Jack Ramage, Joe Beck and Jim Mauler from Cadnetics.



Honorees at the March of Dimes Transportation Building and Construction luncheon on June 22 were (from left) VEBH's Dan Engen, Pamela Schanwald, CEO of Children's Home of Pittsburgh, John Shea, president of the Allegheny County Labor Council, Allegheny County Treasurer John Weinstein and PNC's Mike Gilmore.

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Gateway Engineers' Ryan Hayes (left), Tom Turner and Erin Hayes (right) flank Renee DeMichiei-Farrow from Architectural Innovations.



(From left) Stantec's George Halkias, Lighthouse Electric's Todd Mikecs and Jim McNary.



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Lighthouse's Anton Mikec (left) and Mark Edgar from Mosites Construction at the March of Dimes luncheon.



Mascaro's Bob Breisinger (left) and Bill Ligetti from the Ironworkers Employers Association at the March of Dimes luncheon.



Green Building Alliance Executive Director Aurora Sharrard (left) with Hawken & Smith co-founder Paul Hawken and Dr. Joylette Portlock of Communitopia at the GBA's Inspire Speaker Series.



(Left-to-right) Babst Calland's Matt Jameson, John Skorupan from Pennoni Engineers and PenTrust's Jim Noland at the NAIOP Pittsburgh golf outing.



(From left) Fukui Architects' Felix Fukui, Seubert's Jay Black, Jeffrey Landau and Glenn Sieber from Easley & Rivers at the CREW/NAIOP Pittsburgh Clay Shoot.



GBA's Jenna Kramer (left) and Andrew Ellsworth present a Diploma of Inspiration to Monongalia School District's DeAnn Hartshorn, principal at East-side Elementary and Karen Davis.



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AWARDS & CONTRACTS

Nicholson Construction Company will begin work on the \$179 million Dugway Storage Tunnel as part of an overall program by the Northeast Ohio Regional Sewer District to improve the control of combined sewer overflows in the Greater Cleveland service area. Nicholson will be installing secant piles as the temporary support of excavation for a baffle drop structure, as well as two rectangular gate structures across two site locations that will each connect to an existing sewer system. The 24-foot diameter tunnel will be 180 to 230 feet below ground surface and stretch 2.8 miles from the Easterly Tunnel Dewatering Pump Station (ETDPS) to its upstream terminus at Superior Avenue. Design work was completed by a joint venture of MWH Americas, Inc., and Mott MacDonald, LLC.

F. J. Busse Company was awarded the tenant fitout for New York Life Insurance, a 17,737 square foot renovation of the third floor of Commerce Court at Station Square. The architect for the \$750,000 project is James A. Gaddis Architect PC.

Carnegie Mellon University selected **F. J. Busse Co.** as contractor for renovations to its property at 310 South Craig Street. IKM Inc. is the architect.

Also at Carnegie Mellon **F. J. Busse Co.** was awarded the general trades package of the first phase of the Hamerschlag Hall Maker Space. The project is a renovation of 39,000 square feet. Rycon Construction is the construction manager. GBBN Architects is the architect.

The Pittsburgh Golf Club awarded a contract to **Volpatt Construction** for the restroom renovations to the men's locker room at its facility in Squirrel Hill.

Volpatt Construction was awarded a \$3 million contract for renovations to the St. Peter Parish Roman Catholic Church on the North Side. The architect is Radelet McCarthy Polletta Architects.

Volpatt Construction was the successful contractor on Duquesne University's Mellon Hall Lab 238 and 240 Renovation. Renaissance 3 Architects designed the \$513,000 project.

St. Vincent College selected **Jendoco Construction** as construction manager for the \$4.5 million James F. Will Biomedical Engineering and Science Hall. The project is a two-story, 11,400 square foot addition to the existing Sis & Herman Dupre Science Pavilion. The project was designed by MacLachlan Cornelius & Filoni.

Jendoco Construction is working with Desmone Architects on its \$3.5 million expansion. The project involves a 23,000 square foot addition to the firm's Doughboy Square offices in the historic former Pennsylvania National Bank Building.

Jendoco Construction is doing renovations to the parking garage and plaza at the United Steelworkers Building at 60 Boulevard of the Allies in Downtown. GAI Consultants is the engineer for the project.

Jendoco Construction was awarded Duquesne University's Libermann Hall 4th Floor Biomedical Lab Phase 3. The architect is DLA Architectural and Interior Design.

Duquesne University also awarded **Jendoco Construction** a contract for Fisher Hall Lecture Room 719. The project involves renovations to 2,000 square feet of space on the 7th Floor of Fisher Hall. Work items include new tiers, ceiling removal and replacement, installation of an air handling unit, and new power distribution. Perkins Eastman Architects is the architect.

Jendoco Construction began work on the Benter Foundation office renovations to the 17th, 18th and 19th floors of the Benedum Trees Building. The project was designed by architects Pfaffman and Associates, P.C. and The Mufson Partnership.

Rycon Construction was the successful contractor on the UPMC South Hills Internal Medicine and ENT suite renovations at Village Square in Bethel Park. Images Associates is the architect for the 6,000 square foot build-out.

Chartiers Valley School District awarded a \$33.9 million contract to **Rycon Construction** for the general trades portion of its \$48.5 million high school project. The architect for the 330,000 square foot project is IKM Inc.

First Niagara Bank awarded **Rycon's Special Projects Group** contracts for ADA improvements throughout 61 branch locations in Eastern Pennsylvania.

Rycon's Special Projects Group is completing a 7,700 square foot fitness center at Nova Place (formerly Allegheny Center). Perkins Eastman is the architect on the project which is scheduled for completion by late summer.

A 10,000 sq. ft. medical office renovation is underway in Charleston, WV by **Rycon's Special Projects Group**. The project is scheduled for completion mid-summer.

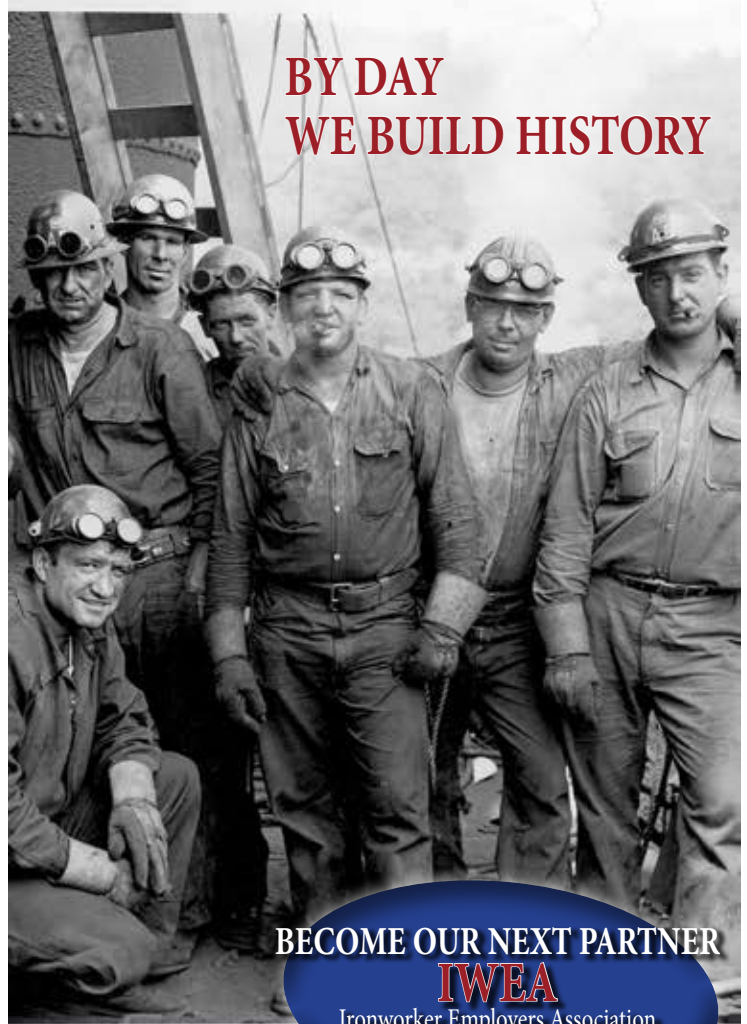
Rycon's work continues on The Block at Northway (formerly Northway Mall) in Pittsburgh's North Hills. Phase 3B which includes multiple new retailers is currently underway.

The Parish of Immaculate Conception selected **Landau Building Co.** as contractor for its \$600,000 elevator addition in Washington, PA. The architect is Tarbert / Architects.

Landau Building Company was awarded Phase II of Allegheny College Carnegie Hall renovations. The 16,960 square foot project encompasses the basement, first floor, and second floor, as well as two stair towers. The architect is PWWG Architects.

Landau Building Company was awarded renovations to the fourth floor of WVU Hospital Physician Office Building in Morgantown, WV. Renovations are approximately 30,500 square feet and include exam rooms, treatment rooms, nurse's stations, doctor work rooms, and other support spaces. Paradigm Architecture is the architect. Work will be completed by the end of 2016.

Marks-Landau Construction, a subsidiary of **Landau Building Company**, has begun renovations to the third floor Cardiology Suite for WVU Hospital at United Hospital Center in Bridgeport, WV. The 8,734 square foot project will be completed in three phases. Anticipated completion for the Cardiology Suite is July 2016.



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Marks-Landau Construction has begun renovations to the operating rooms at United Hospital Center in Bridgeport, WV. The first room began in May and the second room was completed in June 2016. Similar work is planned for nine other operating rooms on the same floor of the hospital.

Cranberry Township Supervisors awarded a \$35.9 million general construction contract to **Mascaro Construction** for the expansion and upgrade of its Brush Creek Water Pollution Control Plant. GHD is the engineer for the \$45.7 million project.

Mascaro received a contract from Lee Industries, located in Philipsburg, Pa., for construction of a new 43,000 square foot manufacturing facility. Lee engineers and manufactures specialty process equipment for the pharmaceutical, food, cosmetic and biotech industries.

Mascaro received a contract from the University of Pittsburgh for conversion of a physics lab into a hydrology lab in the Space Research Coordination Center (SRCC). Mascaro also completed the preconstruction phase and began renovations on the exterior of the building in May, which will be completed around the first quarter of 2017.

Carnegie Mellon awarded **Mascaro** the construction management contract for the 40,000 square foot Tata Consultancy Services Building to be located along Forbes Avenue. Preconstruction is currently underway and construction is anticipated to start around the first quarter of 2017.

Mascaro's Client Services Group received a contract from WABTEC for demolition of Building 16A and construction of a new exterior wall to Building 16 at its Wilmerding facility.

Mascaro's Client Services Group is providing general trades services to McKamish for the installation of



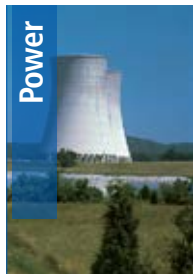
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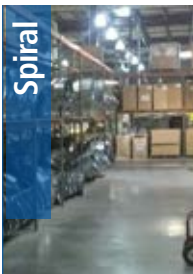
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floor protection in the apartments and common areas of the six-story, 102,389 square-foot Heinz Lofts building during the installation of Whalen heating units in each of the 33 apartments.

G. M. McCrossin was the successful general contractor on the Combined Sewer Overflow Satellite Treatment facility in Donora, PA. The \$15.8 million project for the Mon Valley Sewage Authority involves construction of a 44 million gallon per day treatment plant. Wade Trim Inc. is the engineer.

Excelsa Health held the groundbreaking for its new \$40 million Excelsa Square facility in Latrobe, Unity Township. **A. Martini & Company** is the general contractor for the 115,000 square foot, three-story new ambulatory care center. The architect is Davis Stokes Collaborative.

Heritage Valley Health Systems recently awarded **A. Martini & Co.** two projects one at Beaver Valley Hospital and the other at Sewickley Valley Hospital. The first of the two projects consists of a total renovation to the Brain and Spine Institute Suite within Heritage Valley Hospital - Beaver Campus. The estimated completion date for these renovations is late June 2016. The second project is a renovation to the Bronchoscopy and Mammography rooms on the 3rd floor of Sewickley Valley Hospital. The estimated completion date is August 2016. The architect for both projects is Architectural Innovations.

A. Martini & Co. was awarded the construction/renovation of Fox Chapel Plaza. The project scope includes an entirely new parapet wall including brick façade. The façade work also includes new storefront, two new featured clock towers, and new lighting. The estimated completion date is September 2016. The project architect is Source Architechnology Systems Inc.

Dialysis Clinic Incorporated, of Nashville, Tennessee, awarded **A. Martini & Co.** the construction of a new dialysis clinic in Indiana, PA. This project totals 11,600 square feet and the scope entails the construction of a ground up, single story building. Upon completion the new dialysis clinic will house 12 chairs for the treatment of patients, and it is expected to be completed in early 2017. The architect is SSOE Group.

A. Martini & Co. was chosen as the general contractor for the Veterans Leadership Program of Western Pennsylvania, located in the Strip District. The scope of this 10,000 square foot project consists of demolition and fit-out of a new office space. The space will include offices as well as a reception area. The estimated completion date is July 2016. The project architect is AE Works.

University of Pittsburgh awarded a contract to **Allegheny Construction Group** for renovations to the Cost Sports Center. The project was designed by CDM Smith and is part of a \$5.3 million renovation to the facilities.

AIM Construction was the successful contractor on University of Pittsburgh's Sutherland Hall Resident Director Apartment and East-West Lobbies.

Mosites Construction was awarded an \$11,414,777 contract from Pennsylvania Department of Transportation for the construction of the Mahoning Viaduct on Route 18 in Lawrence County.

St. Alexis Church and Catholic School selected **Mosites Construction** for its \$7.5 million expansion and renovation program. A/E Works Ltd. is the architect.

TEDCO Construction was awarded a contract for the \$2 million, 6,158 square foot addition and renovation to the Unitarian Universalist Church



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of South Hills at 1240 Washington Road in Mt. Lebanon. Rothschild Doyno Collaborative is the architect. Robert Morris University awarded **TEDCO Construction** a contract for renovations to the School of Engineering Math and Science offices at its University Drive campus in Moon Township. RBA International is the architect for the project.

TEDCO Construction is doing construction on the final phase of a multi-year modernization of the Duquesne Towers residence hall at Duquesne University, renovating the third, fourth and fifth floors. The architect is Stantec.

Amazon.com Inc. selected **TEDCO Construction** to build out its offices at South Side Works. The \$3 million project was designed by IA Architects.

TEDCO Construction is the successful contractor on The Porch at Siena in Upper St. Clair for the Eat 'n Park Hospitality Group. The new 6,000 square foot restaurant was designed by NEXT Architecture.

Massaro Corporation has been named the construction manager by the Stadium Authority of the City of Pittsburgh for the Gold Lot 1 Parking Garage to be located on the North Shore next to Heinz Field. The new precast, concrete six-story structure is being built on an existing surface parking lot, and will hold approximately 1,000 vehicles and has a construction value of \$22,589,000. The project architect is WTW Architects.

UPMC Hampton hired **Massaro Corporation** to build its new 48,000 square foot ambulatory care building located at 4480 Mount Royal Boulevard, Allison Park. The \$13.7 million healthcare building will begin this summer. IKM Incorporated is the architect.

UPMC awarded **Massaro Corporation** the Montefiore University Hospital Receiving Operations Renovation project. This project includes

the renovation of a loading dock and receiving area for new kitchen coolers and cart wash equipment. The \$2.8 million project will begin this summer. GBBN Architects Inc. is the architect of record.

Midwife Center for Birth and Women's Health selected **Massaro Corporation** to build its new three-story addition to the existing healthcare facility located in the Strip District. The 6,700 square foot addition will include new birthing suites, exam rooms and administrative support space/offices. Construction on the \$2.4 million project will begin this summer. Rothschild Doyno is the architect.

Massaro Construction Management Services, LLC has been named the agency construction manager by Shaler Area School District for the new construction of Rogers Primary School located at 705 Scott Avenue, Glenshaw. The 80,000 square foot school has an 18 month schedule with a construction value of \$22.5 million. The project architect is HHSDR Architects & Engineers.

State College Area School District selected **Massaro Construction Management Services** as agency construction manager for additions and renovations to two of its elementary school. The architect for the \$24 million program is Crabtree Rohrbach & Associates.

Massaro Construction Management Services was awarded a contract for construction management services by Cumberland Valley School District for its new elementary and middle schools. The \$80 million program involves a 140,000 square foot new elementary and 237,400 square foot new middle school. Crabtree Rohrbach & Associates is the architect.

Burchick Construction is the successful contractor for the \$560,000 Salk Hall Annex and Lobby Renovation project for the University of Pittsburgh. The architect is GBBN Architects.

Shaler Area School District awarded **Nello Construction Co.** a \$16.1 million contract for the general construction of its new \$22 million Rogers Elementary School. The architect for the school is HHS DR Architect & Engineers.

General Service Administration awarded **James Construction** the contract for a complete renovation to portions of the second floor of the Poff Federal Building in Roanoke, Virginia. The architect is Whitman Requardt & Associates.

RB VetCo LLC is constructing a new \$7.5 million parking garage for the Veterans Administration Medical Center in Altoona. The 156,700 square foot garage has a 449-car capacity and was designed by DCS Infrastructure.

PJ Dick was selected to provide CM Agency services to Penn State University for the \$16.5 million Music I Renovation and Recital Hall Addition project. A partnership of Bostwick Design and Rawn Architecture is designing the project.


PJ Dick was selected to provide CM at Risk services to the University of Pittsburgh Bradford for the new Residence Hall Dorm 'P' and Dining Expansion project. MacLachlan Cornelius & Filoni are the architects.

Facility Support Services, LLC (FSS) has started interior renovations on the DOC A-Phase 2 Fit Out at St. Elizabeth's West Campus, Washington, DC for the General Services Administration. This \$13.5 million contract is currently in phase 1 and will complete in March 2017.

FSS was the successful bidder on the Ebensburg Emergency Generators Replacement for the PA Department of General Services.

FSS recently completed the interior renovation for Alloy 26 located at Nova Place. This project is the largest co-working space in Pittsburgh. The architect for the project was Desmone Architects.

dck worldwide took home three awards at the General Contractor Association of Hawaii "Build Hawaii

Awards" in April. The \$28 million Walgreens Keeaumoku Flagship Store project took home an Excellence Award in the Design-Build/Design-Assist Construction \$10-\$30 million category and was the Grand Award Winner. The \$130 million-plus South Range - Grow the Army project won an Excellence Award in the Federal Construction Category. 



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FACES & NEW PLACES

Rycon added **Ryan Ernst** as a project engineer. He obtained a degree in Civil Engineering from the University of Pittsburgh and brings three years experience to the Building Group team.

Rycon's Casework & Millwork Division hired **Oleg Kovalev** as a CNC programmer. He has eight years of industry experience.

Rick Luke rejoined Rycon as a project manager within the Special Projects Group. He has over 40 years experience in the construction industry.

Rycon's Special Projects Group added **Scott McLaughlin** as a project engineer. He received a degree in Structural Design & Construction Engineering Technology from Penn State University.

Graham Nelson joined Rycon's Atlanta office as a project manager. He is a graduate of Auburn University and brings six years experience to the team.

Rycon's Ft. Lauderdale office added **Gerald Tobias** as estimator to its team. He is a graduate of Florida International University with over 20 years of industry experience.

Rycon hired **TJ Winkler** as an intern in the safety department. TJ is pursuing a bachelor's degree in Safety Management at Slippery Rock University.

Richard Zahoranski joined Rycon's Cleveland office as an estimator. He is a graduate of Eastern Michigan University and brings over 19 years construction experience to the company.

Bradley Crow, PE, LEED AP, QCxP is now MEP coordinator/estimator at PJ Dick Inc. **Tim Appman** has joined PJ Dick as a project engineer.

After spending his last two years participating in **Mascaro's** intern program, **Dom Presto** became a full time employee of Mascaro this past June. He received his bachelor of science degree in Civil Engineering from The Pennsylvania State

University in May and will be assigned as a project engineer on the Brush Creek water pollution control facility.

Kirk Alcorn was hired by **Massaro Corporation** as a senior superintendent. He brings with him 38 years of experience with large scale projects ranging up to \$550 million. Kirk has a Bachelor of Science and Associate of Science degree from Milwaukee School of Engineering.

David Felter was hired as a superintendent for Massaro Corporation. He has been in the construction industry for more than 10 years and brings a wealth of experience with him. His Bachelor of Science degree in construction management combined with his large-scale project experience is a recipe for success. He has been in charge of on-site project administration contracts ranging from \$50 million to \$422 million with the construction of the Defense Information Systems Agency in Fort Meade, MD.

Bob Moore was recently hired by **Massaro Corporation** as superintendent. Mr. Moore has more than 38 years of construction experience. His expertise is in supervising and scheduling the on-site workforce including subcontractors, vendors as well as focusing on quality control and safety.

Joe Shipman was recently hired by **Massaro Corporation** as superintendent. Mr. Shipman began his career in the construction industry more than 33 years ago. Over that time, he has held positions such as a superintendent, safety director, lead superintendent, and safety inspector in addition to his many years as a carpenter/journeyman.

Sandra Verhovsek was hired as a project manager for **Massaro Corporation**. Ms. Verhovsek has more than 30 years of construction industry experience and a Bachelor of Science degree in engineering from the University of Pittsburgh, Johnstown.

Justin Hausrath was hired by **Massaro Corporation** as a project engineer. Mr.

Hausrath has five years construction industry experience, four of those years with Whiting-Tuner.

W.G. Tomko, Inc. announced the promotion of **Dan White** to chief operating officer and **Jeff Folco** as director of operations.

On April 16, 2016, the General Executive Board of the **Operative Plasterers and Cement Masons International Association (OP&CMIA)** elected **Daniel E. Stepano** as the new general president of the International Association. Stepano will serve the remainder of the term of General President Patrick D. Finley, who passed away on April 10, 2016. The OP&CMIA is the parent international union of the Cement Masons and Plasterers Local Unions. Stepano joined Plasterers' Local Union 31 in Pittsburgh, PA on August 5, 1980. Dan worked primarily with employer members of the Master Interior Contractors Association (MICA) and the Master Builders Association of Western PA (MBA) including Sicilliano, Vinfred and Wyatt, Inc. He held several positions with Local 31, including as business manager from 1999 until his election as international executive vice president and general executive board member of the International Association in August 2004.

Michael Baker International announced today the appointment of **Caleb Hing**, structural project manager, as president-elect of the American Society of Civil Engineers' Structural Engineering Institute. In this role, Dr. Hing will lead the advancement of the practice of structural engineering through research and the practical application of new technologies to build resilient structures.

Michael Baker International's local architecture and building engineering practice welcomes **Ronald Kretz, AIA**, senior program/project manager; **Charles DeLisio, P.E., AIA, LEED AP**, senior engineer; **Mark Luksik, RA**, architect; **Christina Lynch, RA, LEED AP BD+C**, sustainability coordinator; **Elizabeth Prusch, P.E.**, structural engineer; and **Donald Beyer, P.E.**, electrical department manager. **BG**

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Closing Out

By Dr. Quintin B. Bullock

Before becoming leader of the free world, President Barack Obama was often found out on the campaign trail, speaking about the role that the nation's community colleges were playing in educating America's workforce. Now after nearly two full terms in office, the president and his administration



Dr. Quintin Bullock

continue to raise the profile of the nearly 1,200 community colleges throughout the U.S. From calling for the nation's community colleges to double the number of graduates by the year 2020, to proposing to offer two years of free community college education to every U.S. student, to the numerous visits to community colleges across the country—including to the Community College of Allegheny County in April 2014—President Obama has undoubtedly been the strongest advocate that community colleges have ever had.

This high-level advocacy has led to a resurgence of interest in what two-year institutions of higher learning have to offer. Suddenly in the spotlight as never before, community colleges everywhere—and CCAC was no exception—were at the forefront of a national discussion regarding career training in the 21st century. In addition to being recognized for our success in preparing individuals for future careers, community colleges are actively shaping the role postsecondary education plays in securing America's national and economic interests. And with the advent of more and more countries emerging onto the international stage, jostling for power and competing for a share of the global marketplace, this newfound prominence couldn't come at a better time in our collective history. For what the hundreds of thousands of community college graduates, educators and

employers understand so clearly is that no other educational entity has the ability to deliver the kind of responsive, industry-driven training that community colleges like CCAC do so well. Simply put, community colleges are addressing America's skills gap by providing innovative skills-based career training that today's businesses so desperately need to remain competitive.

So, what does this mean at the micro level, to CCAC and to the region as a whole? By continuing to seek out new opportunities to partner with business and industry, CCAC is a pipeline for workers skilled in the lexicon of the modern workplace—one reliant on creativity, complex problem-solving, advanced technological know-how and a solid understanding of business principles. And too, as new technology and scientific discoveries continue to drive the way governments and companies do business, we at CCAC will keep pace, offering the best of both worlds—academically rigorous education and hands-on workforce training.

Examples of this type of programming are everywhere. In addition to offering more than 150 programs, CCAC provides customized employer and incumbent worker training, available at each of our many campuses and centers, online or at an employer's workplace. CCAC has also partnered with the Energy Innovation Center to provide specialized training opportunities for members of the community, in the community. And we are exploring additional opportunities in communities outside Allegheny County as well as the possibility of building a brand new workforce development center on Pittsburgh's North Shore.


Interestingly, our investment in innovative learning is paying off for the community. Certainly, many students appreciate the

amount of money they save by attending CCAC, but what is not as well known is how much the college gives back to the community, in the form of economic development. According to a recent economic impact study, CCAC returns \$6.67 for every dollar Allegheny County invests in the college.

In this, the college's 50th Anniversary year, it is also important to note the extent of the college's reach and influence. As one of the largest community colleges in the Commonwealth of Pennsylvania, CCAC annually educates nearly 30,000 credit students and offers thousands of students access to noncredit and workforce development courses. We are proud to be the college of choice for one in every three adult residents in the county—and to have helped to educate more than one million individuals since the college's founding in 1966.

In all, CCAC graduates have transferred to the nation's most prestigious colleges and universities, have obtained the most academically challenging and competitive degrees and can be found at leading companies, organizations and institutions throughout the nation. Our alumni are also actively engaged in every sector of society, providing leadership to scores of economic, scientific, civic and philanthropic entities both in the Pittsburgh region and around the world.

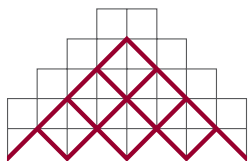
As CCAC looks forward to its next 50 years and beyond, we do so with a clear and guiding vision of providing the programs, knowledge and skills of the future. So, what will be the career skillsets and economic drivers of the 22nd century? We do not know. But, as CCAC's president, I have a pretty good idea which college will provide the answer.

Dr. Quintin B. Bullock is the president of the Community College of Allegheny County. 



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