

Breaking Ground

THE MAGAZINE OF THE MASTER BUILDERS' ASSOCIATION OF WESTERN PENNSYLVANIA

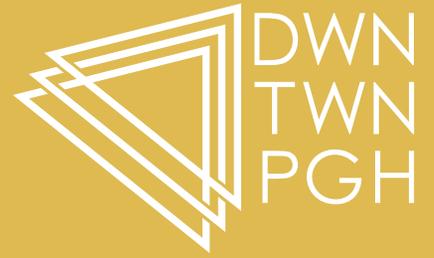
NOVEMBER/DECEMBER 2019

ENERGY MARKET UPDATE

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Clearway's Uptown district energy plant



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Correction:
In the September/October edition McKamish Inc. was incorrectly identified as the electrical contractor in the Project Profile on Porter Wright's office fit-out. McKamish was the HVAC and plumbing contractor. Clista Electric was the electrical contractor.

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PUBLISHER'S NOTE

Warren Buffett is credited with saying that it's only after the tide goes out that you learn who has been swimming naked. The Oracle of Omaha means that businesses can hide a lot of problems when times are good; it's when things get tough that you find out who is prepared.

Back in 2009, as the dust was settling from the financial crisis, construction companies in Western PA were beginning to learn about the Marcellus Shale formation. For the companies that figured out what construction opportunities the exploration meant, they got to avoid the recession. The gas industry descended upon Western PA, needing stone, and earthwork, and paving, and concrete, and billions in construction services. For most of the last decade, that appetite for construction remained high, even when the price of oil and gas collapsed. There was an entire industry buildout to complete.

Today, the demand for construction in the gas industry – and energy overall – is a bit thin. That's very disappointing for those counting on the industry to continue to buy construction services; but it's perfectly normal in the topsy-turvy world of energy. The energy industry, whether it's fossil fuels, nuclear reactors, or solar panels, is a capital-intensive business. It takes billions of dollars to build the capacity to generate electricity or heating and air-conditioning for millions of people. The demand for energy – and therefore the price – fluctuates dramatically over the course of a decade or two. Those in the energy business understand this and try very hard to have cash in reserve when the tide goes out. Those that succeed have their swim trunks on. Those that don't, feel a little cool breeze where the tide once was.

Pittsburgh's economy has seen cyclical swings before. Reliant upon heavy industry for almost 100 years, Pittsburgh's economy saw the highs and lows that accompanied the economic cycles. When times were good, people bought cars and washing machines. That meant companies that made cars and washing machines needed steel, glass, and paint. That was good for Pittsburgh and its many small communities. For the past 35 years, regional leaders have been searching for industries to replace heavy industry. It's been our good fortune that instead of one or two cyclical industries, Pittsburgh has been rejuvenated by a broad spectrum of industries. One of those is energy.

I've been lucky to have been in a number of meetings over the past decade during which the future of the Pittsburgh economy was debated. There were a lot of smart people in those rooms and one of the things that was generally agreed upon was that Pittsburgh should try to attract a diverse

economic base. That's a great strategy, but one that is hard to execute. It's to the credit of Pittsburgh's many leaders that the regional economy today is one that is diverse and forward-looking.

The problem with trying to attract a diverse group of industries to smooth out the business cycles is that you can accidentally attract businesses that are in highly cyclical industries. That is definitely the case for the energy industry. We're going to talk a lot about the natural gas industry in this edition of BreakingGround, but the other sectors of the energy industry – be they coal, windmills, nuclear or solar – have proven to be slaves to business cycles of their own. That's not a bad thing. It just means businesses working in the energy sector must adjust to the cycles. That has worked well in Texas, and the Gulf Coast, and the United Arab Emirates for many years.

It was hard to find anyone complaining about the cyclicity of the energy business in 2009, when a boom in construction was getting underway. There are other drivers of the economy developing in Pittsburgh that may eclipse the energy sector for capital spending or job creation. Most of those aren't as beholden to the business cycle as the energy industry. Most of those other emerging industries also aren't necessarily tied to Western PA either. The burgeoning autonomous vehicle or artificial intelligence industries are growing here because of the happy coincidence of needing the talent that Carnegie Mellon is supplying. The energy industry is here because the core assets of the industry are here. Venture capitalists can lure tech companies to California or New York. Other universities may develop better engineering and software graduates. For the foreseeable future anyway, you won't be able to draw the resources located under the ground in Western PA from halfway across the country.

So, embrace the cycles. One of the beautiful things about having a diverse economy is that it can tolerate a boom-and-bust industry or two. The oil and gas industry invested billions in Western PA over the past decade, and it will invest billions more as market conditions allow. The tide will come in and it will go out. The trick is to keep your swimsuit on.





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REGIONAL MARKET UPDATE



The economic conditions of a region are the underpinning of its construction industry. As of the beginning of the fourth quarter of 2019, most readings of the Pittsburgh economy are strong-to-solid, if not spectacular.

Jobs are the strongest source of demand for construction. Growing employment creates demand for space in office buildings, warehouses, and plants. Pittsburgh’s lack of population growth is a drag on job growth, but through nine months employment is up about 0.9 percent. That is around where employment gains have finished for the past four years. Hidden in that modest employment number is the fact that Pittsburgh’s labor force has grown even more rapidly than its new jobs. That’s an indication that the effort to attract workers to offset the large outflow of retiring Baby Boomers is working thus far. It also is an indication that the population may be growing slightly, an indication that will be tested in the 2020 census.

In the September Metro Mix publication by the Federal Reserve Bank of Cleveland, Pittsburgh’s employment situation was characterized as “steadily advancing.” Among the data cited by the Fed are an unemployment rate that fell 0.4 points to 3.8 percent from September 2018 to 2019, and total payroll employment of 1.123 million, a net gain of more than 10,000.

Metro Mix also took a look at the income and balance sheet of Pittsburgh residents. The real income per capita of a Pittsburgh resident was nearly \$56,000, a 2.1 percent

increase from 2017. This is above the income per capita for Pennsylvania and the U.S. Consumer debt in Pittsburgh is significantly below the Pennsylvania and U.S. levels as well. Debt per capita for the average Pittsburgh consumer was \$26,968 after the first quarter of 2019, following one percent growth in 2018. Not surprisingly, the credit card delinquency rate for a Pittsburgh resident was only 6.6 percent, lower than the 7.5 percent U.S. average.

A strong economy is a good indicator for commercial real estate development. The resurgence of Pittsburgh’s economy over the past decade has been matched by a strong, if not booming, commercial real estate market. A number of factors suggest that commercial real estate will continue to be a positive driver of construction in 2020.

Pittsburgh’s industrial market is extremely robust as the third quarter ends. Normally a slower season, summer saw unusually high activity for leasing and acquisition. The latter is getting a boost from capital sources outside of Pittsburgh, which love the steady returns and strong fundamentals. Among the metrics that are tempting investors and developers are the low vacancy rates, especially for Class A warehouse, and the steady increase in rents. Occupancy levels for Class A reached 97 percent through the end of September and the overall industrial vacancy rate was 6.4 percent. Rents for Class A space rose to \$5.70/square foot. Most impressive was the net positive absorption of 1.9 million square feet, which threatens to eclipse the highest annual total on record.

According to Newmark Knight Frank’s analysis of the industrial market, the high absorption, coupled with increased users in the market for space, will drive construction of build-to-suit opportunities in 2020. They specifically forecast increased activity for users of 200,000 square feet or more.

One of the factors driving industrial development in Pittsburgh is the growing demand for smaller warehouses to meet the demands for e-commerce fulfillment. Heretofore, fulfillment centers, like the one million square foot warehouse under construction for Amazon at Chapman Westport, were large and sited close to interstate transportation hubs. The

By County	SFD	SFA	M/F	Total
Allegheny	570	241	1110	1921
Beaver	64	31	4	99
Butler	448	199	0	647
Fayette	43	4	0	47
Washington	308	49	226	583
Westmoreland	176	33	119	328
Total Pittsburgh MSA 2019:3	1,609	557	1,459	3,625
Total Pittsburgh MSA 2018:3	1,629	583	1,099	3,311
% Change	-1.2%	-4.5%	32.8%	9.5%

Permits for single-family detached and attached homes were off slightly from 2018, but a surge in apartment construction more than offset the decline in single-family construction. Source: Pittsburgh Homebuilding Report.

METRO AREA SNAPSHOT						
	Unemployment Rate		Median Home Value		Payroll Employment	
	June 2019	One-year Change	June 2019	One-year Change	Dec 2018 (thousands)	One-year Change
Pittsburgh	3.8%	-0.4	\$ 143,600	1.9%	1,123	0.9%
Pennsylvania	3.8%	-0.4	\$ 173,800	3.2%	5,891	1.1%
United States	3.7%	-0.3	\$ 227,700	5.2%	146,988	1.5%

Source: Federal Reserve Bank of Cleveland, Fourth District Metro Mix.

growth of e-commerce volume is accelerating delivery times and pushing warehousing and fulfillment to smaller facilities located closer to denser population centers. This shift in logistics is making Pittsburgh more feasible for warehouse development than it was when the previous logistics models drove construction.

Pittsburgh's office market held strong through three quarters, despite increases in space available for sublease. Through September 30, net absorption stood at 160,000 square feet, according to CBRE. The increases in absorption were mainly due to strong activity in the Central Business District (CBD) fringes – primarily the Strip District – and in the Airport Corridor, which saw positive absorption of 130,000 square feet. The occupancy level rose to 86.3 percent, with a total Class A direct vacancy rate of 12.5 percent.

Vacancy increased in Downtown proper due to large corporate consolidations, including BNYMellon, PNC and Bank of America. Falling vacancy rates in the Strip District and Oakland helped offset these holes in the market. According to CBRE, Oakland's Class A direct vacancy rate fell to one percent. Even with more than 550,000 square feet of new space under construction, occupancy levels are expected to remain constant. Rents rose for the sixth consecutive quarter, hitting \$27/square foot overall and topping \$30/square foot in the CBD.

The office market is less supportive of new construction than industrial, primarily because of the available space and the high cost of construction in the most desirable locations. The continuing growth in employment in the emerging technology, healthcare, and research fields will create more demand for space and new construction. The market for tenant improvements should be more robust in 2020 and, depending upon how much of the proposed spec development proceeds, new construction in the Strip and Oakland could top two million square feet.

Tall Timber Group's building permit and market research for the first three quarters of 2019 found a residential market that is being driven higher by multi-family construction and a nonresidential/commercial sector that is lagging the forecast – and last year's volume.

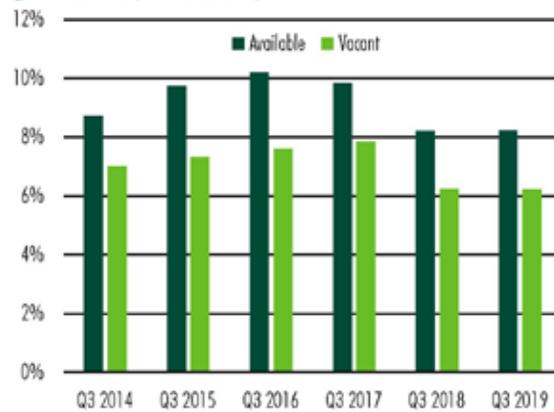
For the first nine months of the year, construction of new single-family homes is off by 2.2 percent, or 48

homes, compared to the same period in 2018. Permits for new multi-family units were up 32.8 percent – 1,459 units to 1,099 units – year-over-year through September 30. According to residential real estate executives, new construction is being constrained by higher costs, fewer available lots, challenging development conditions, and an inadequate supply of skilled construction workers. The inventory of existing homes for sale is also shrinking, and has been for several years. This is helping to accelerate appreciation for homeowners. Sales volume and price appreciation would be higher but for the lower home ownership rate for younger buyers. Low home ownership rates are also helping to keep apartment demand strong. Total housing units started in January through September were 3,625, compared to 3,311 a year earlier.

Contract awards and starts for nonresidential/commercial construction were at \$3.73 billion for the first nine months of 2019. That's \$500 million less than for the first nine months of 2018. A combination of higher prices, economic uncertainty, and indecision has resulted in the deferral of the start of work on a number



Figure 3: Vacancy vs Availability



Source: CBRE Research, Q3 2019.

(CBRE industrial) Source: CBRE Pittsburgh Industrial Marketview, 2019 Quarter 3.

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MARKET ANALYSIS

Asking Rent and Vacancy



Source: Newmark Knight Frank Office Market Report.

of projects, including some of the region's largest. Prospects for the fourth quarter look stronger than those of 2018, but the total construction for 2019 will end up falling below the \$5 billion mark that was expected.

Pittsburgh's construction market has been driven by a groundswell in \$5 million-to-\$50 million projects, even as the headlines have been dominated by major project news. The story of the construction market in 2019 has been as much about the impact of the delays in those major projects as by the demand the major work is creating. Looking ahead to 2020, here are updates on some of the headline projects, along with some of the important industry sectors.

U.S. Steel has been procuring some of the underground and preliminary contracts to prepare for its \$900 million new mill at the Edgar Thompson Works in Braddock. Fluor is doing the engineering on the new combined casting and rolling mill – along with a \$250 million cogeneration plant in Clairton – and procurement on the first of the packages is anticipated by mid-year.

The airport's \$1.1 billion Terminal Modernization Program is well into design and the first of the enabling packages is expected to go out to bid before the end of 2019. The project, which is split into two major components, should go out to bid on major packages for the new construction later in 2020.

UPMC's major hospital capital program has been slowed down due to concerns about labor availability and business strategy. The South Hills hospital project has been put on hold indefinitely, although it's worth noting that the project has been on and off several times during the past two years. The \$250 million expansion of Shadyside Hospital and the Hillman Cancer Center has also been deferred. Work on the Shadyside bed tower is not expected to begin until mid-2021. UPMC's flagship project, the \$700 million Heart and Transplant Hospital to replace Presbyterian University Hospital has also been deferred until 2021, although design is expected to resume in the third quarter of 2020.

Construction on Shell's Franklin Plant, the \$6 billion petrochemical facility in Potter Township, is approaching peak employment of 5,500 workers on site. Progress on the project allowed the massive 695-foot tower crane, the so-called "Mother of All Cranes" was removed from the site in November. Peak employment is expected to continue through 2020, with a drawdown of the workforce occurring from 2021 until construction is completed in 2022. A final investment decision



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by PTT Global Chemical/Daelim is anticipated in early 2020, which should then begin to build towards its peak construction employment as the Shell project winds down.

The University of Pittsburgh's ambitious capital program should begin to transition from planning to construction. A bevy of \$100 million-plus projects has been committed to design/construction management teams over the past year and several should get under construction. Among those are the expansion of the School of Medicine, which will be built by PJ Dick/Hunt; the new Student Recreation Center and Mid-Campus Residence Hall, for which Mascaro/Barton Malow is the construction manager; and the Human Performance Center and central plant projects, which Massaro/Gilbane will build in the Victory Heights section of campus. Further progress on the \$100 million Academic Center and the Lower Campus Housing complex is scheduled for the first half of 2020.

The major general construction piece of ALCOSAN's wet weather equalization program, the \$120 million North End plant expansion, is scheduled to be released for bid in the second quarter of 2020.

Pittsburgh's economic drivers have shown resilience to the global and national business cycles over the past 15 years.

Activity on these major capital projects will be sufficient to push construction volume to record high levels in 2020. For the meat and potatoes part of the Pittsburgh construction market, much will depend upon the confidence of business owners in the direction of the economy. Presidential election years have historically been slower for construction. Next year's election cycle is likely to create more uncertainty than other national elections, as it is occurring during a time of more global economic anxiety. Pittsburgh's economic drivers have shown resilience to the global and national business cycles over the past 15 years. That should continue and, if the emerging technology, "eds and meds" drivers accelerate job growth, construction in 2020 will be immune to the negative influences of the larger economy. **EG**

NATIONAL MARKET UPDATE

The start of the fourth quarter brought a bevy of reports that point to a slowdown in the pace of growth globally, even as construction spending remained remarkably resilient. The trade dispute between the U.S. and China is having a negative effect on domestic gross domestic product (GDP), but U.S. economic output is still growing at an expected two percent rate. Throughout the rest of the industrialized world, however, economic growth is dragging.

In the U.S., the October report on September's manufacturing output caused the most concern with U.S. economists. The Institute for Supply Management (ISM) Purchasing Managers' Index was at 47.8 percent in September, the lowest reading since June 2009. A reading of 50 or higher means that purchasing managers reported expansion of orders. Readings below 50 mean contraction. September marked the second consecutive month of contraction. More troubling was the steep decline in new export orders. That index read 41 percent in September, down from 43.3 percent in August.

Weakness in manufacturing, slower growth of consumer spending, and lower exports are expected to bring domestic GDP growth to about 1.5 percent in the third and fourth quarters.

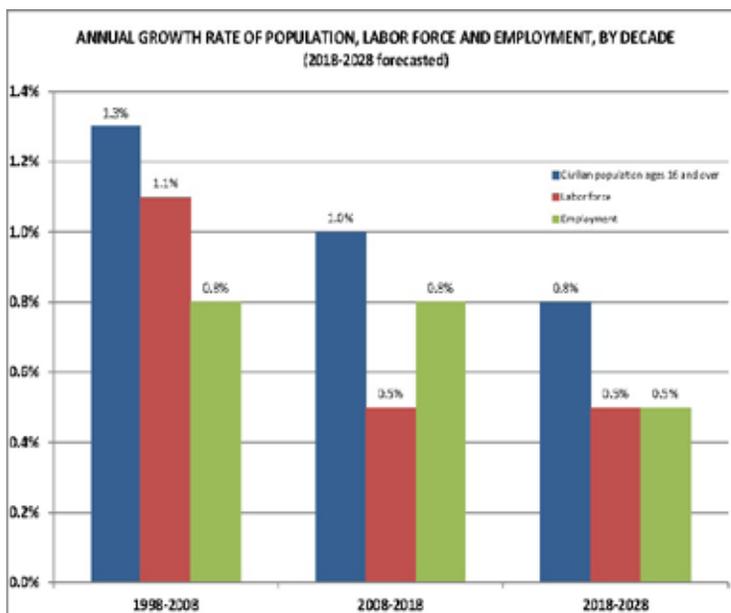
Exports have been hurt by the tariffs and deepening trade dispute with China, along with lesser clashes with

European Union (EU) countries, Mexico, and Canada. The tariffs have also had a ripple effect across the globe. On October 1, the World Trade Organization slashed its estimate of the growth in global trade of merchandise from 2.7 percent to 1.2 percent for 2019. China's rate of growth continues to slow, and its exports to the U.S. have slowed at the same time. That has meant much lower demand from Chinese manufacturers for the German machinery and German-machined components that go into Chinese goods. Germany's declining economic output is a further damper on Europe's economy, which has slowed in the face of lower demand and fears over the impact of Great Britain's exit from the EU. Fears about the effects of a no-deal Brexit have slowed investment in Europe, which has triggered layoffs.

Thus far, the slowdown in the labor markets has not become an issue in the United States. The reading on September's hiring showed that employers were still adding jobs at a healthy pace. There were 136,000 more jobs in September, an increase of 28,000 from the same period one year earlier. The Bureau of Labor Statistics (BLS) also revised the data from July and August upward significantly, showing about 60,000 more jobs added than were previously estimated. For observers looking for a slowdown in hiring as a recession signal, the October 4 report showed that employers are still adding staff to accommodate growth and growth plans, even if at a lower rate than two years ago. There is also ample evidence to suggest that hiring is being limited by insufficient supply, rather than falling demand.

The U.S. unemployment rate fell to 3.5 percent in September, a 50-year low. Workforce participation remained much lower than at the previous cyclical high, but the demographic trends suggest that the low participation rate is a structural problem, rather than a reflection of the unemployed remaining on the sidelines. In fact, the civilian labor force jumped by 117,000 in September and the total change in employment in September was 395,000 higher. The pace of retirement for Baby Boomers is simply keeping the workforce participation rate steady in the low 63 percent range. This is a trend that is expected to continue for another decade or more.

On September 4, BLS issued its biennial 10-year projections of output, labor force and employment growth. The report covers the 2018-2028 time period and compares metrics during the 10-year periods reaching back to 1998. Growth in employment is supposed to slow from the previous 10-year period from 0.8 percent to 0.5 percent. Labor productivity is expected to grow from 1.6 percent to 1.8 percent, which will keep GDP growth on a par with



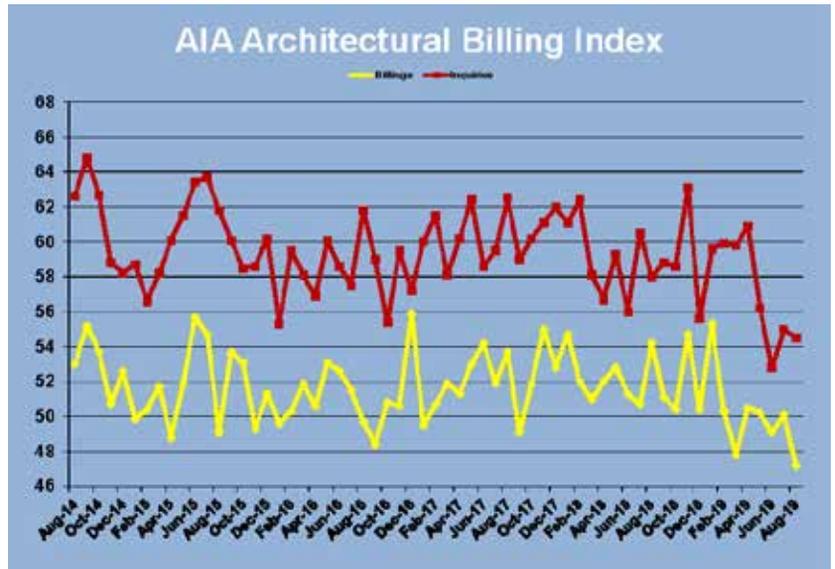
The Bureau of Labor Statistics' 10-year forecast for employment trends sees growth, output, and labor participation rates slowing by 2028.

the 2008-2018 period. Employment and productivity are expected to grow fastest in the professions that relate to healthcare services. Population growth is expected to fall to 0.8 percent, due to low birth rates and lower immigration.

The Federal Reserve's Beige Book reflected the shift in attitudes about the economy during the third quarter. Its August Beige Book characterized the responses in its various districts as expecting moderate growth, even as headlines about the economy were darkening. October's Beige Book reported concerns about recession for the first time. It will be several more months to judge whether the more cautious attitudes persist and begin to impact decisions about spending.

One of the most-watched signals on the future construction economy, the AIA's Architectural Billings Index (ABI), turned negative in August for the third time in six months. August's ABI fell to 47.2 percent, the lowest since June 2012. August was the second month in 2019 with an ABI below 48 percent. A reading below 50 means that more firms saw declining billing than growing. Billings are an indication of design activity and a reliable predictor of construction activity 12 months hence.

"The sizeable drop in both design billings and new project activity, coming on the heels of six months of disappointing growth in billings, suggests that the design expansion that began in mid-2012 is beginning to face headwinds," said AIA Chief Economist Kermit Baker. "Currently, the weakness

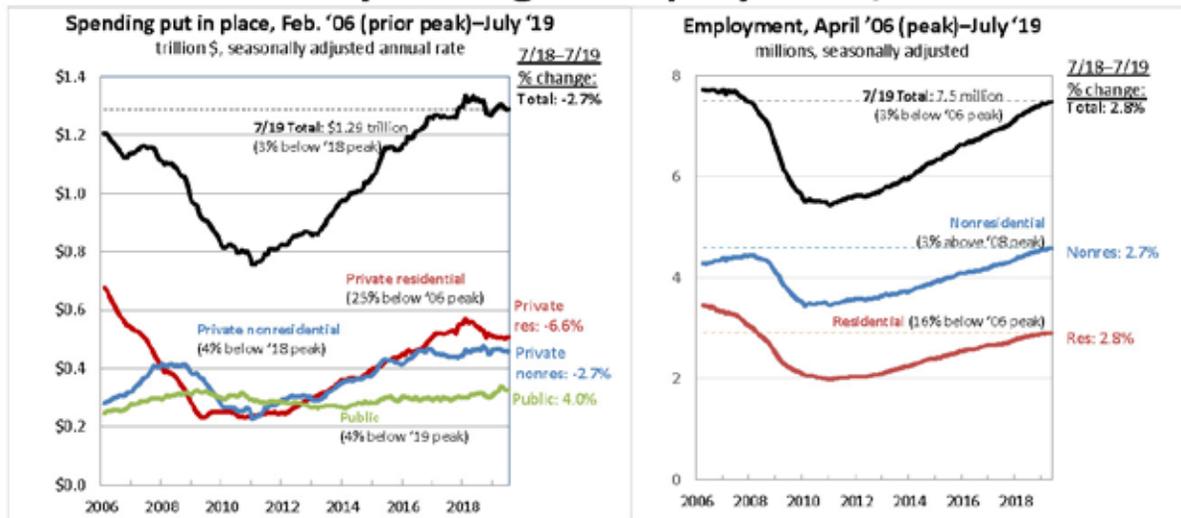


Negative reading in architectural billings for two months in Summer 2019 indicate that nonresidential construction is likely to slow further in 2020.

is centered at firms specializing in commercial/industrial facilities as well as those located in the Midwest. However, there are fewer pockets of strength in design activity now, either by building sector or region than there have been in recent years."

Construction spending totaled \$1.287 trillion in August, a gain of 0.1 percent from the July annual rate, but 1.9 percent less than the August 2018 rate, according to estimates the U.S. Census Bureau released October 1. Spending in January through August fell 2.3 percent compared to the first eight months of 2018.

Construction spending & employment, 2006–2019



Source: spending—U.S. Census Bureau; employment—Bureau of Labor Statistics



Public construction accounted for much of the gains during the first eight months, growing by 4.6 percent. Horizontal infrastructure spending was up 10.8 percent and transportation construction was 9.3 percent higher. Public education spending was off by 0.8 percent. The biggest decline was seen in commercial building construction, which dropped 14.9 percent. Private residential construction, including multi-family and residential improvements, was off five percent year-over-year.

Housing starts soared in August, jumping 12 percent from July and 6.6 percent compared to August 2018; however activity reversed course in September, with a 9.4 percent decline that brought starts to a 1,256,000 annual mark. A spike in multi-family construction (up 31 percent from July) in August was essentially wiped out in September, when multi-family fell 28.2 percent. Single-family starts rose slightly, by 0.3 percent. Low lot inventory levels and lagging home ownership rates for Millennials still act as drags on the new single-family construction market.

An inadequate volume of new development remains the culprit for residential construction in the U.S. There remain regulatory issues that are a hangover from the mortgage crisis, but the increased burden of environmental and municipal regulations, and increased costs, have made residential development less attractive as an investment.

Fifteen months past the July 2018 peak for construction spending, activity remains unusually steady. Compared to construction spending following the 2006 peak of the last business cycle, activity is quite close to the \$1.317 trillion total in July 2018. The 2018 peak is slightly more than \$100 billion above the 2006 peak, although the mix of construction is different. Driven by the housing bubble, the 2006 residential construction total was 25 percent higher than the peak of 2018. Employment in residential construction is similarly lower, off 16 percent from 2006. Nonresidential construction is nearly \$200 million higher than in 2006, but employment in nonresidential construction is only three percent higher than the 2008 peak. Overall, employment in construction is 7.5 million workers in July 2019, still three percent less than the 2006 peak. That gap owes more to demographics and the supply of new workers, however, than it does to demand.

An analysis of the trend in construction spending and employment done by the Associated General Contractors of America (AGC), illustrates the caution that many are feeling about 2020-2021. During the past 12 months, total construction spending has declined only 2.7 percent. Given the normal ebb and flow of business cycles, steeper declines should follow during the next 24 months. There are some differences between the current cycle and previous cycles.

Primary among the differences are the moderate level of residential spending and the low levels of public construction



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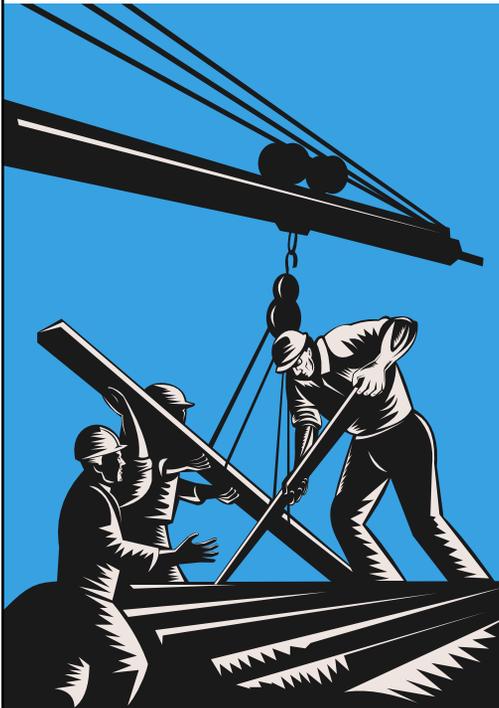
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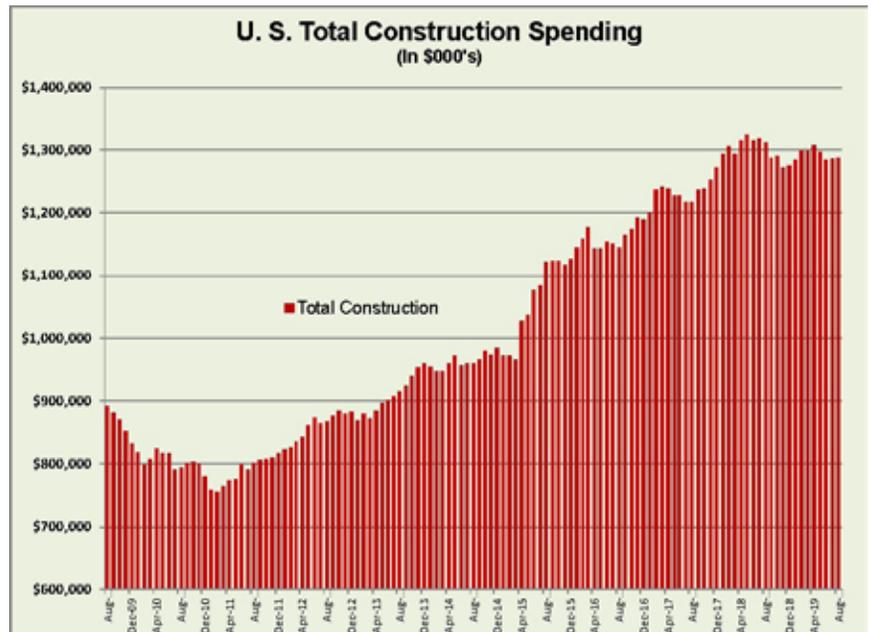
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spending. The former reflects the deleveraging needed to respond to the overbuilding of the 2004-2007 bubble, but it also indicates that consumers and renters have not pushed the envelope of their respective finances. That means the chances are greater that any slowdown in residential construction will be moderate and, with Millennial homeownership rates unusually low, the demographics should be a tail wind for recovery. Public spending has been depressed following the burst of infrastructure construction that accompanied the American Recovery and Reinvestment Act of 2009. If infrastructure maintains bipartisan support through the 2020 election cycle, you can expect more robust increases in public construction. Even as public education and infrastructure need increased investment, spending on public education has increased by four percent since the July 2018 peak. That is the only category to see an increase during the past 18 months.

AGC's chief economist, Kenneth Simonson, expressed three major concerns about the construction economy in his presentation to the National Economists Club on October 17, noting that all major categories of construction have declined three to five percent from their cyclical peak. Simonson said he had concerns that trade disputes and tariffs would increase costs and suppress demand, that the labor shortage would continue to limit contractors (especially in a hostile immigration environment), and that income-producing properties and housing could be adversely affected if interest rates rose.

Given the state of the business cycle and the global economic outlook, an increase in interest rates is unlikely, but it's likely that U.S. construction spending has seen the peak of this expansion and will continue to decline gradually over the coming quarters until the next economic tipping point. While most economists expect that to be a mild recession sometime in the next 18 months, election politics and a lack of inflation point to the likelihood of interest rate cuts from the Federal Reserve. These cuts are primarily motivated by the low inflation environment and the unusually bearish activity in the bond markets on long-term Treasuries. Those cuts are not going to spark another leg higher in expansion, but the cheaper capital should be an incentive for business investment and home ownership that will prevent a serious slowdown in the economy. **BG**

WHAT'S IT COST?

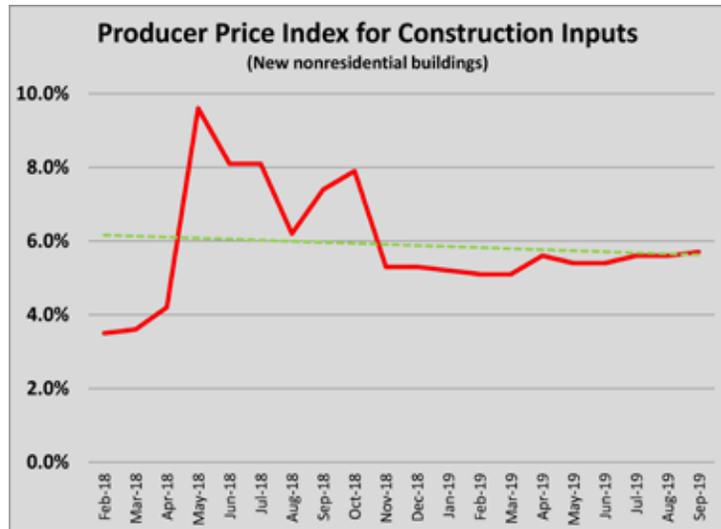
The year-end 2018 changes in market direction for a handful of key building product materials have become the prevailing trend in construction inflation. The good news: inflation has become stable year-over-year. The bad news: stable inflation has settled in above five percent for 12 months.

Actually, the good news is that the prevailing trends will make construction inflation lower in 2020. There are two caveats to that forecast. First is that no unforeseen disruptions in supply or demand jar the market for a significant component like oil or steel. The second is that, although stable, construction inflation has steadily edged up from 5.1 percent (for new nonresidential construction) in March to 5.7 percent in September. This is likely the persistent impact of inadequate labor supply pushing bids upward. And, with the trends for major components falling, construction prices in 2020 should reflect the higher cost of labor but little inflation from materials.

The Bureau of Labor Statistics' report on October 8 revealed that producer prices (PPI) for inputs to construction overall were only 0.4 percent higher than one year earlier. That same category was up 6.1 percent, year-over-year, in September 2018. Comparisons of September 2019 to twelve months earlier saw big declines in the prices of energy inputs (down 14 percent year-over-year), diesel fuel (down 16.6 percent, but up 5.5 percent since August), steel mill products (down 11.1 percent), lumber and plywood (down 10.1 percent), and gypsum products (down 8.0 percent). These inputs were up between 29 percent and 7.2 percent between September 2017 and September 2018. Among the major construction materials and building products, only architectural coatings (up 6.4 percent) rose more than five percent.

Construction wages lagged the wage gains of the average private industry employee. Construction workers saw a 2.9 percent hike in compensation from September 2018, while private industry workers wages jumped 3.0 percent. One interesting trend was the divergence in fee for architectural and engineering services. Architects' fees declined 1.2 percent year-over-year, while engineers charge 2.1 percent more.

The slowdown in the global economy should sap demand for construction products further in 2020. That should offset any unexpected spikes that could arise from political or trade disputes that might arise. Assuming the current trends continue into 2020, construction inflation should begin to moderate closer to three percent. **EG**



PERCENTAGE CHANGES IN COSTS Consumer, Producer & Construction Prices	Sept 2019 compared to		
	1 mo.	3 mo.	1 yr.
Consumer price index (CPI-U)	0.0	0.2	1.2
Producer price index (PPI) for final demand	(0.4)	(0.3)	1.4
PPI for final demand construction	0.1	0.8	5.5
PPI for new nonresidential buildings	0.2	0.9	5.7
Costs by Construction Types/Subcontractors			
New warehouse construction	0.7	1.6	6.2
New school construction	0.1	0.3	7.1
New office construction	0.1	1.3	4.7
New industrial building construction	0.1	0.7	6.6
New health care building construction	0.3	0.8	4.5
Concrete contractors, nonresidential	0.1	1.1	7.2
Roofing contractors, nonresidential	0.2	0.8	2.5
Electrical contractors, nonresidential	(0.6)	0.3	5.0
Plumbing contractors, nonresidential	(0.1)	0.2	5.5
Construction wages and benefits	N/A	1.1	2.9
Architectural services	(0.6)	(0.5)	(1.2)
Costs for Specific Construction Inputs			
#2 diesel fuel	5.5	7.1	(16.6)
Asphalt paving mixtures and blocks	0.5	0.6	1.4
Cement	0.0	0.7	2.7
Concrete products	(0.3)	0.5	3.4
Brick and structural clay tile	0.1	1.1	2.0
Plastic construction products	(0.1)	(0.2)	0.8
Flat glass	(0.2)	0.9	1.0
Gypsum products	(0.1)	2.2	(8.0)
Lumber and plywood	0.4	(1.1)	(10.1)
Architectural coatings	0.0	(1.1)	6.4
Steel mill products	0.8	(3.1)	(11.1)
Copper and brass mill shapes	(0.2)	(1.5)	1.0
Aluminum mill shapes	(0.4)	(1.9)	(4.8)
Fabricated structural metal	(4.7)	0.2	(0.2)
Iron and steel scrap	(11.7)	(7.4)	(25.3)
Source Bureau of Labor Statistics, Updated October 8, 2019 Compiled by Ken Simonson, AGC Chief Economist			



ENERGY & CONSTRUCTION



The Tenaska Westmoreland combined cycle plant was the first of the gas-fired power plants completed in Western PA. Photo courtesy Tenaska Energy.



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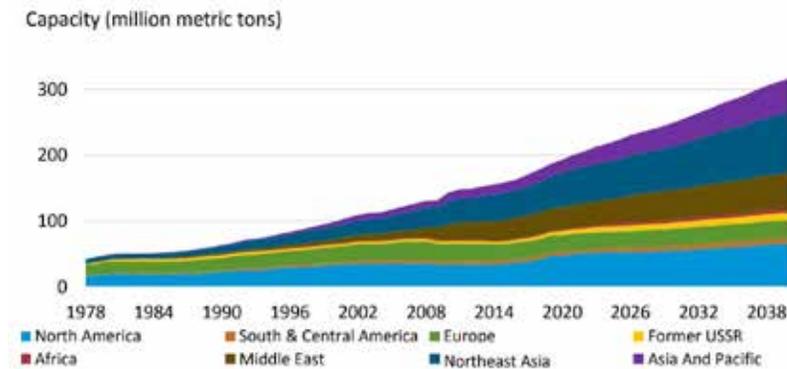
We were warned. When the first players in the Marcellus Shale exploration came to Pittsburgh, their message was optimistic. There would be billions invested and tens of thousands – if not 100,000 – new jobs. But the glowing forecasts were also tempered with a caveat: this was a long-term play in an industry that is highly cyclical. The most public relations-oriented producer at that time, Range Resources, spoke of the downstream benefits of the natural gas play to Western PA, but also made plain that the build-out would take a decade or two.

When the gas industry delivered on its early promises, rejuvenating small communities throughout Washington County and Greene County, it was easy to forget the business cycle. Hotels were popping up everywhere. Towns like Canonsburg and Waynesburg saw their fortunes reversed. Southpointe II was developed almost overnight as a result of the demand for space. Dozens of construction companies became very profitable at a time when the U.S. economy was in the doldrums.

The Marcellus play was a boost to the economy that kept Pittsburgh from feeling the worst of the Great Recession. It was a catalyst for Pittsburgh’s early recovery. Construction of the upstream exploration facilities and midstream processing and distribution facilities added as much as 25 percent to the region’s construction volume in the early 2010s. By 2014, however, The Pittsburgh region found out that the warnings about the oil and gas business cycle were for real.

Oil prices tumbled from \$100 per barrel in July to a low of \$26 per barrel the following January. While this was an unexpected collapse, the industry knew that the shale boom had created a global glut that would soften the price. As it had countless times before, the oil and gas industry retrenched. Thousands of people were laid off. Drilling of new wells stopped. Contractors found out the hard way that multi-national companies like Chevron and Halliburton are comfortable demanding 20 or 30 percent price cuts from their vendors.

This wasn’t Pittsburgh’s first brush with the downside of the energy cycle. It wasn’t even the region’s first down cycle of the 2010s. In March 2011, an earthquake caused a major accident at the Fukushima Daiichi nuclear reactor in Japan. That accident was a dash of cold water on the nuclear



Ethylene production in the U.S. is forecasted to nearly double from 2018 to 2038, outstripping the demand from U.S. consumers. Source: Ethane Storage and Distribution Hub in the United States by U.S. Department of Energy, November 2018.



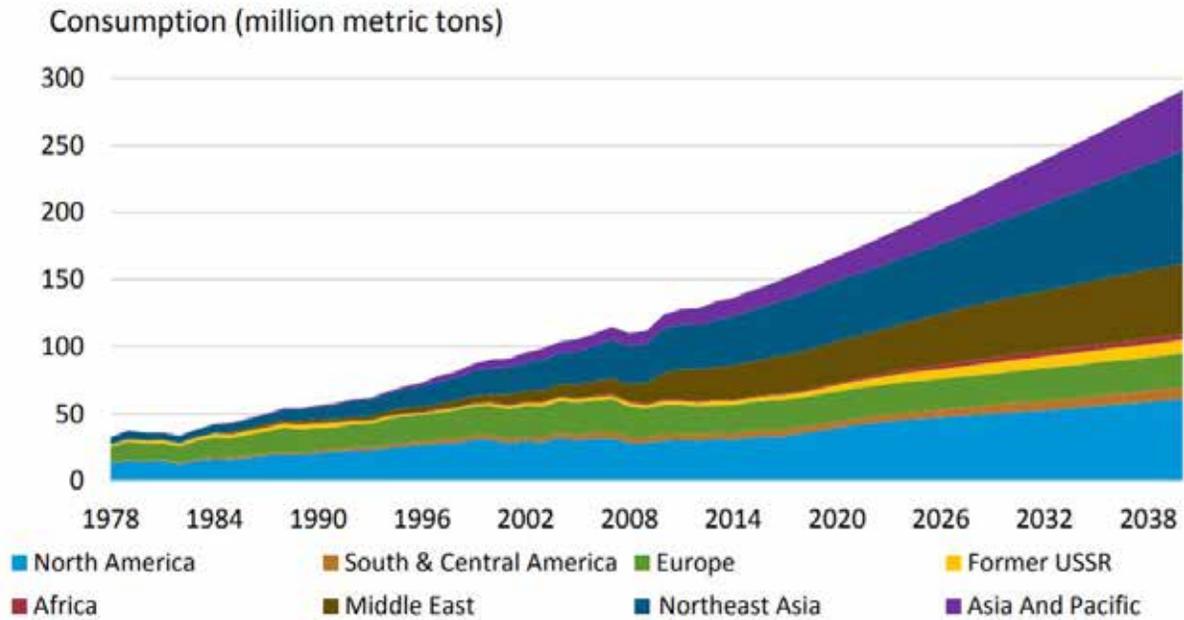
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Source: *Ethane Storage and Distribution Hub in the United States* by U.S. Department of Energy, November 2018.

power generation industry, which had been booming again in the 2000s, as China and India began growing rapidly. Westinghouse, one of Pittsburgh’s success stories, saw its business decimated. A brand new million-square-foot campus in Cranberry Woods became overbuilt, overnight.

Western PA has long had energy as a key component in its economy. Oil was discovered in Titusville, PA. Refineries still dot the back roads of Butler County and Venango County. Electricity wasn’t discovered in Pittsburgh, but George Westinghouse fought – and won – the battle of alternating current that built his company into one of the world’s largest. And natural gas has been plentiful beneath the ground in Western PA long before fracking unlocked the key to shale exploration.

None of this is much consolation for the companies that built themselves into businesses that could serve the energy industries earlier this decade. The shale gas boom, the nuclear energy boom, and even the alternative energy boom, have all cooled off at the end of this decade. Energy is still big business, and big business in Western PA. For the time being, however, demand and market conditions aren’t kind to the energy business. Pittsburgh construction companies should take heart, however. Demand for energy is hardly slowing. Global population continues to grow, and mankind’s usage of electricity is growing even faster. It is in conditions like these that the energy industry

innovates. The next round of innovation is being tested now. The best innovations will spark the next surge in activity. From all indications, at the end of 2019, that next surge is further on down the road.

Market Conditions Update

One important factor to bear in mind when assessing the state of the energy markets is that the demand for energy continues to grow. Unlike ups and downs in other cyclical industries – like automotive or appliances – the dynamics of the energy markets are influenced by market share rather than market size. Energy consumption globally has essentially been growing forever. That has been true during recessions or major conflicts. Growth rates have accelerated or declined, but growth has been constant.

Energy demand grew by 2.3 percent in 2018. That was the fastest rate of growth in more than a decade, even though economic growth slowed. Population growth, combined with growing modernization and electrification, ensured that the world’s citizens needed more power than ever. As a share of the energy pie, electricity continues to grow at

a faster pace than the overall energy consumption rate. Electricity demand increased by four percent last year. More than 70 percent of the energy demand came from the U.S., China and India.

Mountaineer has received most of its approvals to build a 325-million-barrel storage facility on 205 acres along the Ohio river in Monroe County, OH.



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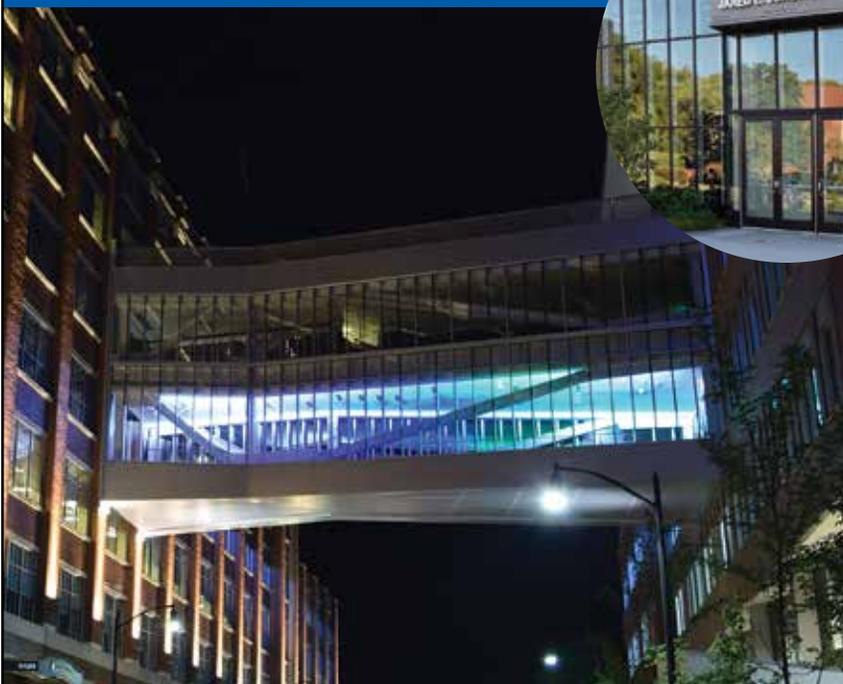
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As a share of the electricity generation output, natural gas accounts for more than half the market. Use of solar and wind power grew rapidly again in 2018, by 31 percent, but the increase in renewable was insufficient to offset the use of gas, oil, and coal as generating fuels. Consumption of oil and coal grew slower than the overall growth of demand but was still higher in 2018.

Electricity generation represents the area of greatest potential for construction activity worldwide. In addition to the raw growth of demand from increased population, electricity is growing as a substitute for fossil fuels. This means the demand for power plants will be higher than in the past.

Natural gas-fired power generation has been the growth opportunity in this segment. As recently as 2018 three of these plants were under construction in, or just outside, the metropolitan Pittsburgh area. The first of these was the Tenaska Westmoreland project near the Smithton exit of I-70. Two larger plants followed, one south of New Castle and another

at Hatfield Ferry in Green County. A fourth major project is still under construction in northern Cambria County. These plants were part of a wave of a dozen plants proposed or built between the Susquehanna River and I-71 in eastern Ohio.

The rise in these gas-fired plants, which are a more efficient combined-cycle design, was sparked by the increase in cheap natural gas supply that resulted from shale exploration, and the need to generate electricity in a more environmentally friendly manner. Combined cycle plants emit 50 percent less carbon dioxide than coal-fired plants. The increase in gas-fired plants is driving innovation in the sector. Advanced natural gas combined cycle technology allows for larger and more cost-efficient power (ANGCC) plant construction than the current combined-cycle technology. The share of ANGCC plants being planned is expected to rise to 70 percent or more by 2022.

A growing share of alternative generating solutions and tougher environmental regulations has blunted the expansion of gas-fired power plants. The year 2018 was the peak year for combined-cycle plants, as 19 gigawatts of capacity came online nationally; however, the capacity added in the coming years will be lower. According to the U.S. Energy Information Administration (EIA), slightly more than 23 gigawatts of additional generating capacity is planned for the four years from 2019 to 2022.

Renewable sources of generating capacity continue to grow more rapidly than any other. EIA estimates for 2018 find that the combined output of wind and solar grew by 31 percent. The share of renewable sources has grown to 11 percent of the total generating output, although solar and wind make up less than one-third the production of the total renewable category.

There are trends that are encouraging for the renewable sector. Most important of these has been the speed with which the wind and solar generation technologies have achieved price and performance parity with other sources in the electrical grid. Wind, for example, has doubled in capacity since 2011 and has become \$12 to \$18 per megawatt hour cheaper than fossil fuel generation. The unsubsidized cost of wind and solar have declined more than 70 percent during that period.

Integration into the grid has also reached parity with other generation technology. The variable nature of wind and solar generation historically created problems for grid management, but the intermittency has been overstated and grid operators are using the combination of generation and storage to balance the grid. States with big spikes in load usage and higher levels of wind and solar generation capacity – like Texas and California – have seen increased grid reliability.

A final trend impacting renewables is the growth in community-scale energy solutions. Microgrids and district energy projects deliver power to communities or large facilities without tapping into the electricity grid. Wind, and especially solar, are nearly always a component of the power generation solution in these small-scale networks.

For Western PA, the natural gas market has become the most important energy sector to watch. Pittsburgh has emerged

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as a green city and leader in the global climate change battle, but its economy relies on natural gas as a significant and growing driver.

Industry trends for the Marcellus and Utica gas have deteriorated over the past two years. Pricing remains depressed. The huge demand drivers that may yet come – an outcome still in doubt – will not materialize until the petrochemical capacity is up and running in 2022. More troubling is the fact that the financing for exploration has become scarcer.

Yet, for an industry facing choppy waters, the gas industry isn't going backwards. There were 917 oil or gas wells drilled in 2018 in Pennsylvania. Producers extracted 6.1 trillion cubic feet of gas in the commonwealth last year, according to the Department of Environmental Protection's 2018 Oil & Gas Report.

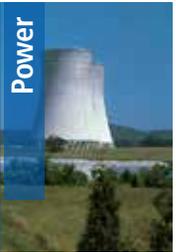
Marcellus Shale Coalition's president, Dave Spigelmyer, says that the industry expects the supply of gas to grow again in 2019. Spigelmyer notes that while the low price of gas is stunting the growth of the industry, the supply – which now equals 20 percent of the U.S. total – still supports thousands of jobs that weren't here a decade earlier. A Washington County business leader agrees.

"As you would expect, the volume of activity and inquiries has certainly slowed from the initial boom of the natural gas industry when it was first developing in Washington County and around the region over 15 years ago," says Jeff Kotula, president of the Washington County Chamber of Commerce. "However, as the industry has matured and stabilized, the demand has remained relatively steady among both indigenous companies and new businesses looking to tap into the plentiful supply of natural gas and opportunities that exist to service the natural gas producers."

Of course, the plentiful supply is the main factor depressing the price. An inadequate uptake and distribution system exacerbate the supply glut, forcing producers to sell their gas at a discount to the Henry Hub price, which currently sits just above \$2 per million Btu (mmBtu). Discounts for sales at Marcellus terminals are a dollar or more



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per mmBtu. Under these conditions, producers are working well below the break-even point. The problem isn't confined to the Appalachian region. Prices for gas at the Waha Hub in the Permian basin touched negative \$9 per mmBtu in April. Gas is a co-product of the oil drilling in the Permian and Bakken basins – the opposite of the mix in the Utica – and the market conditions for the shale oil industry are also poor. The result is that shale oil production in the U.S. is expected to grow 3.1 percent in 2019, in contrast to 21 percent growth in 2018.

The problem for the industry isn't supply, however. It's that demand isn't growing as fast as supply.

"The international market is a key niche for demand. We have a world class supply of energy that could be used globally," notes Spigelmyer. "The U.S. is the leader in producing oil and gas. That could be used as a strength for the country if we play our cards properly. Having the capability to liquefy gas and ship it means we would

need significant cryogenic facilities on the East Coast and Gulf Coast beyond what we currently have."

Investors have become increasingly concerned about returns that have not matched up to pro forma for the production and shareholders are pressuring producers to raise dividends rather than using the capital for exploration. New investors are harder to attract. As a result, the Standard & Poors 500 Oil & Gas Exploration Index has declined 21 percent over the past ten years, while the broader S & P 500 Index has increased by 177 percent.

Debt is still cheap, and likely to be cheaper in 2020, but lenders are aware of the dynamics of the shale play too. Mindful of the poor returns, lenders are not rushing to extend credit for more drilling.

Most of these dynamics are 180 degrees from the Marcellus and Utica shale play results. Unlike shale oil wells, natural gas production has surprised analysts by tailing off more slowly than expected. Generally speaking, pressure in the Appalachian has been greater than expected. The commodity price for

According to the construction report Planning Engineering Construction (PEC), there are \$240 million worth of construction planned for plastic plants in Western PA, OH and WV.

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gas has been depressed, with steep discounts at many hubs because of inadequate takeaway infrastructure, while the price of oil has remained relatively stable above \$50 per barrel. There is much less oil in the shale wells of the Appalachian yet the impact of the problems in the Western U.S. shale oil exploration will be in the Appalachians because the big producers are the same in both places.

It is the big producers that are expected to take advantage of the poor market conditions in the coming year or two. Drillers with access to cheap money could sell the future growth and had the production to back up the story. With investors now looking for profitability instead of growth potential, how does that change the landscape for the industry? Many observers expect to see multinational companies buying the regional driller/producers, hence the rumor that EQT was a target for Chevron.

Like when the oil price fell from \$100 to \$26 per barrel over the course of six months in 2014, corporate resources for capital expenditures in the Appalachian gas fields will decline as the financial pressures in the oil fields mount.

“The idea behind CHP is using all this abundant natural gas to create electricity right on site. It is much better for the environment; it’s more reliable; and, with the price of gas being so low, it’s actually more economical as well than using traditional methods.”

– Morgan O’Brien, CEO of Peoples Gas.

Construction Opportunities

For as gloomy as market conditions are in the shale basins, there is still an infrastructure to complete. The Department of Energy reported to Congress last November that production of ethylene is expected to grow from roughly 170

million metric tons in 2018 to 325 million metric tons by 2038. History has shown that projections of demand 20 years out tend to fall short of actual demand, although growing concerns about plastic pollution could impact ethylene and polyethylene demand over the coming

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Construction of compressor stations and other midstream facilities slowed dramatically in 2019, reducing the construction volume in Western PA by more than \$500 million. Photo courtesy MarkWest Partners.

decades. This forecast represents enormous potential for Western PA if the manufacturing assets for these plastic building blocks are located here.

The buildup of manufacturing resources in the Appalachian Basin is meant to create an alternative source of supply that is less vulnerable to weather events and closer to the customers for the ethylene and polyethylene. It's this buildup that is a generational source of demand for construction. In order to meet this potential new source of demand, the supply infrastructure must be increased. Building that supply network creates three significant construction opportunities: pipelines, midstream capacity, and ethane storage.

Even with reduced capital expenditures, producers will be continuing to build out the pipeline and processing network needed to maximize the potential of the natural gas commodity located beneath Western PA. Progress on major projects has been delayed as often by legal considerations as financial worries.

"The area that's been slow to develop has been pipeline infrastructure construction, which is critical to building take away capacity for markets like New England and the East Coast," says Spigelmyer. "There are a couple of pipeline projects that have been held back because

of protests that would get gas to the East Coast. The regulatory environment in Pennsylvania has been good but government in New York has blocked it. New England has some of the most volatile pricing structures in the country because they don't have the capacity to get gas there during periods of high demand, whether that is for electricity or high demand for heating."

The Mariner East pipeline project is a good example. After upgrading the existing pipeline, Sunoco Logistics has been building a second 350-mile pipeline (Mariner II) to connect the Marcellus and Utica shale gas to its Marcus Hook terminal in suburban Philadelphia. The pipeline would provide access to markets for liquid natural gas that could ease the glut of Appalachian gas and expedite profitability for the producers in Western PA and Ohio. Mariner II has been through its regulatory reviews, including numerous environmental objections, and has a plan for construction that is approved. A series of legal challenges have prevented Sunoco and its construction partner, Energy Transfer Partners, from completing the project.

Within the Appalachian region, considerable new construction remains incomplete to build out the processing and distribution network that will be required

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when the exploration of the shale formations reaches its full potential. Two years ago, for example, ten compressor stations were built or expanded to handle the increased volume of gas that required separation and distribution. Billions were spent between MarkWest's massive Houston plant and those in eastern Ohio, which was all connected by the Falcon pipeline. More work remains.

Kathryn Klaber, of consultants The Klaber Group, says that it's difficult to ascertain how much more investment remains but suggests that construction thus far "represents maybe 40 percent."

"The midstream sector of the natural gas industry continues to develop the necessary infrastructure to process and transport our abundant resources to market, both locally and outside the region. As that capacity continues to increase, we see opportunity for growth in the downstream areas of the natural gas industry as well as with companies in the manufacturing sector that can utilize the ample supply of low-cost energy to fuel their operations," says Kotula. "This region is also still attracting the attention of major global players in the oil and gas industry for development of transformational projects, similar to the Shell Cracker Plant facility currently underway in Beaver County. The continuing efforts of the business community, policy makers and economic development agencies in establishing an ethane storage hub in the region will be critical to realizing those kinds of projects in the future and should be supported as an aspirational goal for the Greater Pittsburgh Region."

The third piece of the puzzle necessary to create the manufacturing opportunities Kotula is talking about attracting is having an adequate supply of ethane. Part of Shell's early due diligence on the Appalachian was its verification that the shale formations could provide abundant ethane for it to "crack" into petrochemical products. That research uncovered a supply that was sufficient for three to five crackers, depending on capacity. As Shell's Franklin plant passes the midway point in construction, the heat has been turned up on one of the lesser-publicized major construction opportunities: ethane storage.

Several ethane storage projects have been reported or rumored to be in the works. The one that is moving fastest is being proposed by Mountaineer NGL Storage LLC. Mountaineer has

received most of its approvals to build a 325-million-barrel storage facility on 205 acres along the Ohio river in Monroe County, OH. The site is located 12 miles from where PTT Global Chemical has proposed building its ethane cracker.

Ethane storage facilities are massive caverns in the salt or rock formations well below the surface. Construction involves blasting/drilling out the caverns and filling the voids with water. Once ethane is brought to the facility, it is pumped into the cavern, displacing the water. Mountaineer's plans call for developing four caverns capable of storing 500,000 barrels of ethane each.

Energy Storage Ventures is a portfolio company of a private equity fund of Goldman Sachs & Co. Access to capital from Goldman Sachs' merchant banking division should ensure the project is financed once final approvals are received. Beyond the construction of the storage facility itself, which is estimated to cost \$250 million or more, the project is estimated that it will generate the need for \$500 million in additional pipelines and \$1 billion in additional fractionation capacity to separate the natural gas liquids. Mountaineer NGL Storage has not announced a construction schedule, but work should start in 2020 in order to meet the demand from the new polyethylene facility in Beaver County.

It is the utilization of natural gas in the manufacturing of petrochemicals that was to unlock the full economic potential of the Marcellus play. As the startup of the first of those facilities is in sight, the potential for construction of the downstream manufacturing may not be as significant as once hoped.



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PTT Global Chemical continues to defer its final investment decision on starting the \$6 billion petrochemical facility it has proposed on the Ohio River, near Dilles Bottom, OH. PTT, in partnership with Daelim, has invested more than \$100 million in engineering and feasibility studies for the plant, and received hundreds of millions in subsidies and tax credits from the state of Ohio. Rumors circulated earlier this year that the reason for the numerous delays in making a final investment decision were because of the difficulty in financing the project, which was reported to be leading PTT to sell the project to a global major oil producer. None of that has been confirmed.

What is known is that the project has grown in capacity by roughly 50 percent since its inception. In addition to the \$100 million-plus invested, PTT has also gone to the trouble of getting its environmental approvals, including site disturbance, discharge, and air quality permits. These are paramount to getting started. And, despite rumors to the contrary, PTT has hired Bechtel to act as EPC for the project.

More has also been gleaned about what PTT will be producing. While Shell is primarily producing high density polyethylene (HDPE), PTT's production is expected to be 25 percent HDPE, 25 percent low density polyethylene (LDPE), and 50 percent ethylene oxide and other derivatives in the ethane chain. HDPE and LDPE are the raw materials for most of the consumer and commonly used industrial plastics, the manufacturers of which were hoped to follow Shell, and its competitors to Western PA.

One of those competitors, Exxon Mobil, had real estate representatives in Beaver County in October to look at sites for a potential third cracker. Neither Exxon Mobil nor the property owners who met with the oil giant have commented about the seriousness of the conversation, but reports like McKinsey's Forge the Future have found that the supply of gas is plentiful enough to support at least one more petrochemical plant like Shell's.

While we don't know what we don't know, what we do know is that the large manufacturing opportunities haven't materialized yet.

According to the construction report Planning Engineering Construction (PEC), there are \$240 million worth of construction planned for plastic plants in Western PA, OH and WV. That work is divided among 40 projects, with an average size of 70,000 square feet.

Ethylene oxide, which PTT will produce in significant quantities, is a building block for the broader industrial chemical industry. It is used as an intermediate chemical for products that range from fertilizers, to cleaners, to antifreeze, and sterilizing ointments. The Dilles Bottom plant offers more potential for a broad range of downstream manufacturing but the plant itself is still in the potential category.

“The McKinsey study said that if we develop this asset strategically, we could create 100,000 jobs and grow GDP by \$60 billion by 2025,” says Spigelmyer. “That downstream market piece is the most important one to that growth. We can use that as a significant job producing mechanism.”

In the absence of certainty about the downstream impact of the gas industry on Western PA, there are still opportunities for construction in other energy segments.

The landscape for renewable energy projects has changed dramatically during the past decade. Artificial incentives, like Pennsylvania’s renewable energy credit (SREC) program, drove construction of windmill farms, solar arrays, and manufacturing plants to support those businesses. But the wind and solar markets were crashed by a glut of projects that were justified by SRECs rather than the market for renewable energy. The price of SRECs fell by as much as 90 percent. Today, however, the cost of renewable energy is competitive and the volume of construction projects has risen. Instead of building for SREC financing, wind and solar generation projects are being built on the merits of the technology advantages.

Pennsylvania has been, not surprisingly, a hotbed for combined-cycle plants, with 25 percent of the growth in capacity for the entire U.S. These plants have been large construction projects, running in the hundreds of millions, and approaching \$1 billion in the case of

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larger plants, like Hickory Run near New Castle. In Western PA, only two projects are currently in the pipeline. Invenergy has been unsuccessfully attempting to find an approved site along the Monongahela in Elizabeth Township, Allegheny County, and Bologna Enterprises continues to pursue the on-again, off-again Beech Hollow plant. Neither of these two are imminent.

Pittsburgh is also in the midst of a boom in construction for generation and distribution of energy at the local or facility level. At present, no fewer than six central plants or district energy plants of \$35-40 million or more are either under construction or about to be. These range from replacing obsolete central plants in major hospitals, to building redundancy in university settings, to constructing new hydroelectric generation facilities.

The most recent high-profile construction opportunity for this kind of project is the Pittsburgh International Airport’s proposed microgrid. Peoples Gas Company is developing a combined heating and power (CHP) facility, which will take advantage of the natural gas being extracted from beneath the airport’s vast acreage by CNX to generate electricity in addition to heating and cooling the buildings. The deal, announced on October 18, will create a microgrid that serves the airport’s two terminals and the airfields, as well as the Hyatt hotel and Sunoco gas station adjacent to the parking lots.

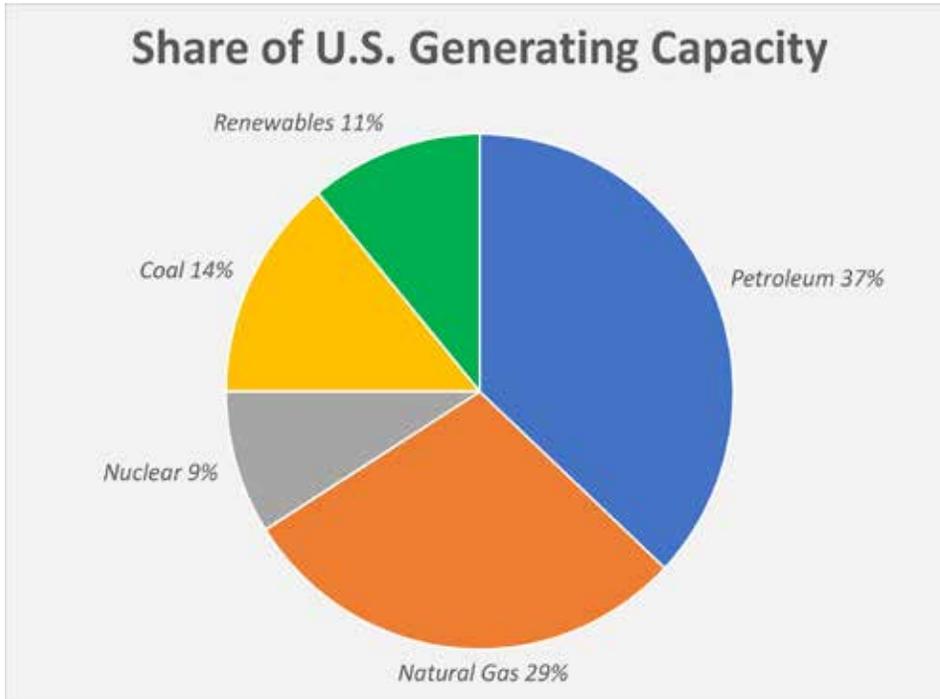
In the wake of power outages at Los Angeles International and Hartsfield-Jackson Airport in Atlanta, Pittsburgh International becomes the first U.S. airport to be energy self-sufficient. Pittsburgh’s airport will not technically be off the grid – it will remain connected for emergency situations – but the energy created on the county’s land will be more than sufficient to operate the airport, even at peak times.

“The idea behind CHP is using all this abundant natural gas to create electricity right on site. It is much better for the environment; it’s more reliable; and, with the price of gas being so low, it’s actually more economical as well than using traditional methods,” says Morgan O’Brien, CEO of Peoples Gas. He explains that CHP plants help ease one

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The good news for Western PA is that its economy is not based upon energy. The multi-faceted approach to business attraction has yielded a more diverse economic foundation than those regions that live or die with the price of oil. Yet Pittsburgh has already seen how a robust energy industry can fill in the valleys of the global economic cycles. Anyone who thinks Pittsburgh would have fared as well during the Great Recession without the Marcellus Shale play simply isn't looking at the data.

of the major concerns for institutional power users like airports, hospitals, or 24/7 corporate centers, which is maintaining uninterrupted access to electricity.

"A big challenge with hospitals, for example, is the need for reliability. If there is a power outage or a technical problem with the grid they don't operate, literally," O'Brien says. "Reliability is a high priority and what CHP provides for them is another layer of redundancy."

Peoples' plant will generate 20 megawatts, 140 percent more than the 14 megawatts that the airport currently has for its capacity. A combination of natural gas-fired generation and 7,800 solar panels will provide the electricity for the microgrid, which Peoples will own, operate, and maintain. The microgrid will be operational in the summer of 2021.

Keeping the Faith

What is occurring today in the Appalachian Basin, which includes Southwestern PA, is part and parcel with the business cycle for the energy business. This is an industry with norms that are different from the business cycles of the industries that have driven the Pittsburgh economy. Energy relies on innovation and large speculative capital spending to assemble the assets that are used to generate or harness power, and to anticipate or create new ways to do so that provides a competitive advantage to the speculator. There are winners and losers. Places like Texas have grown accustomed to the boom-or-bust cycle of the energy markets. Pittsburgh is experiencing it anew.

There is another complicated facet to Pittsburgh's embrace

of the energy industry. Pittsburgh is at the clean end of a 50-year effort to restore the environment after the wreckage caused by heavy industry. That legacy of cleaning the environment drives those who are resistant to giving Pittsburgh's economy over to fossil fuels. In counterpoint, Pittsburgh has become one of the hubs for researching and implementing energy solutions that don't harm the environment. But this balancing act between economic development and sustaining the environment will be a source of tensions in politics and civic leadership.

The choice isn't a binary one between jobs or environment, as advocates for each side often suggest. The gas industry has taken strides to make exploration safer for people and the environment. It will have to make more. Environmentalists understandably see fossil fuels as a compromise to environmental principles, but the energy demands from society are simply too great to abandon such an abundant, cheap source of energy without a comparable solution. And those solutions are still over the horizon at this point.

Better conditions tend to make the balancing act easier. Oil and gas companies have more capital to invest in environmental innovation and regulation. Investors have more cash to support riskier new innovations that could expand renewable sources of energy or reduce consumption. As a center for sustainability, renewable energy research, and the world's second-largest natural gas deposit, Pittsburgh will benefit from the rising tide.





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PROJECT PROFILE

PITTSBURGH UPTOWN ENERGY CENTER

Mascaro Construction completed the construction of the Energy Center Pittsburgh Uptown at the end of May 2018. The \$52 million project is a heating and cooling plant developed by NRG Energy, now Clearway Energy Inc. after an August 2018 acquisition. The 30,000 square foot structure was built on a parcel in the Uptown section of the Hill District between PPG Paints Arena and the City View Apartments. Its construction was an important component for one of Pittsburgh's largest new construction projects.

The impetus for the energy center was UPMC Mercy Hospital's need for updated and expanded heating, cooling, and power. The hospital system developed a plan for a new plant and parking garage but, before executing the project, NRG Energy entered the picture with a plan to build a state-of-the-art facility to serve the hospital's energy needs. NRG operates the steam facility on the North Side near Allegheny Center. It proposed building a center Uptown to serve UPMC Mercy on a long-term contract basis, which allowed UPMC to use the land slated for its plant to build the new \$450 million Vision and Rehabilitation Hospital.

One of the appealing characteristics of the site chosen for the energy plant was the fact that it was zoned to permit

construction from lot line to lot line. This allowed NRG/Clearway to develop a structure that could adequately house the equipment planned for the facility. That favorable zoning status made for design and construction challenges that aren't present in a suburban green field site.

The project used a design-build delivery method, for which the successful team was selected in November 2016, after part of the preliminary design was completed. Mascaro and its partner CJL Engineering then entered into an intensive four-month preconstruction planning process that allowed the early construction packages to be prepared for bidding. Final planning continued another two months into the start of construction.

Planning for the Uptown Energy Center had several major challenges. One was taking the project through the City of Pittsburgh's entitlement and planning process. That process included sharing the plans for the project with the Hill District and Uptown community groups. Because the plant was located on a separate site from its customer, UPMC Mercy Hospital, there was the challenge of designing and planning the extension of the utility infrastructure through the streets of Uptown. Finally, there was the challenge of designing a facility that met the requirements of the client and the client's customer, UPMC.

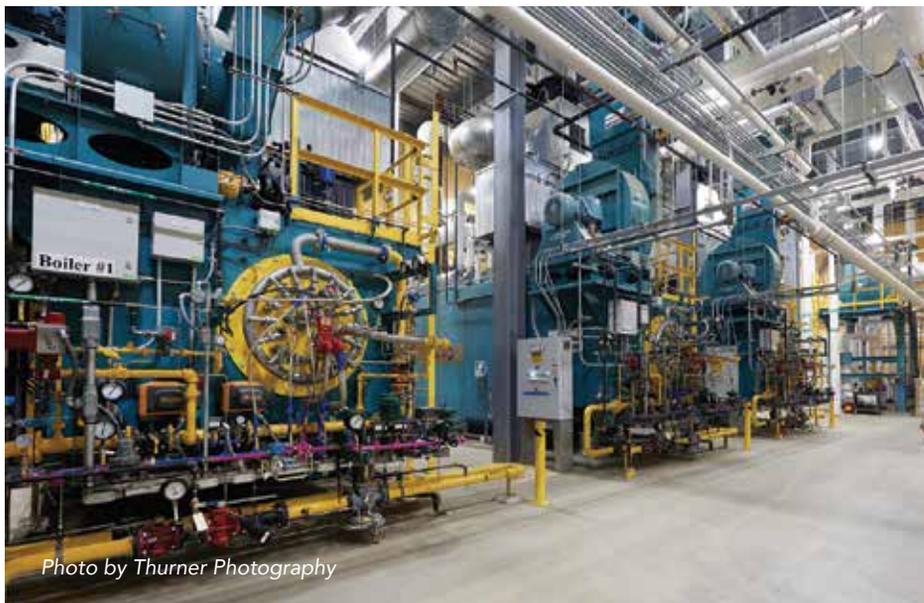


Photo by Thurner Photography

“To put a plant where it was going, we had the City of Pittsburgh requirements but there were also the community groups that we had to satisfy,” says Rick Avon, partner at Avon Graf Architects LLC, a consultant to CJL. “If they were all in agreement it would not have been a problem, but we had to figure out which group had the ultimate say. So, we took everybody’s comments and incorporated them into the project.”

Avon notes that some of the comments were contradictory. For example, there was a push to make the exterior of the building transparent, so that the inner workings of the building could be viewed from the neighborhood. There was also a city mandate that the building be soundproof enough that sound emissions stopped at the property line, which could not be accomplished with a transparent exterior. Avon says there were also concerns about the building’s scale that could not be accommodated.

“For a building that size, people were concerned about the urban context and wanted it to have a human scale. Unfortunately, to have a building that had human scale you could not fit all the equipment,” he explains. “There was also concern about making the design more interesting. But in that location, we needed to take advantage of every part of the building. The owner wanted to spend its money on the equipment because that is what’s running the plant. But they agreed that, because of the location, the building should have character. We decided to use Kolorshift panels from Centria to add some context and movement.”

Alan Traugott, CJL Engineering’s partner managing the energy center, explains that the plant’s design was complicated enough but the end user threw a major monkey wrench into the works midway through the process. Instead of designing a highly efficient, sustainable plant for UPMC Mercy Hospital, CJL was designing a plant that would also suit the needs of a 410,000 square

foot world-class Vision and Rehabilitation Hospital.

“The biggest challenge was the time. We were trying to pull together a fairly complicated plant and tie in to the hospital with a very tight turnaround time because the hospital needed the services to be in place,” Traugott says.

CJL also worked on the central plant that UPMC shelved and was the engineer for a significant mechanical upgrade to UPMC Mercy that was being done concurrently with the Uptown Energy Center. Neither of those project experiences would be helpful in what was probably the biggest challenge of the Uptown Energy Center project, which was building the

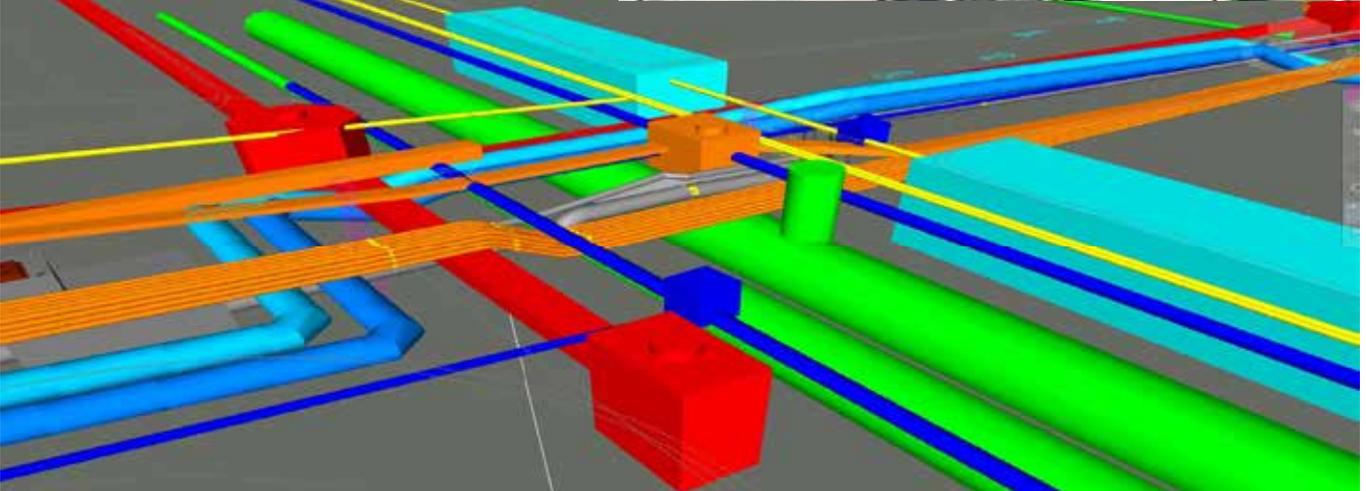
infrastructure that connected the plant to the hospital.

“There were lots of unforeseen and undocumented obstacles under the streets – old Verizon vaults and Pittsburgh Water and Sewer Authority (PWSA) connections to what must have been housing on Stevenson Street. It was 12 pounds of stuff in a five-pound bag kind of thing,” jokes Traugott.

“Perhaps the biggest challenge was the underground street work,” agrees Dave Lochrane, MEP coordinator on the project for Mascaro. “This plant feeds Mercy Hospital and will eventually feed the Vision and Rehabilitation Hospital tower. There are 36-inch chilled water lines. There is a 26-inch high pressure steam line. Those lines run all the way up Stevenson Street to the Boulevard of the Allies. We put in about five miles of piping.”

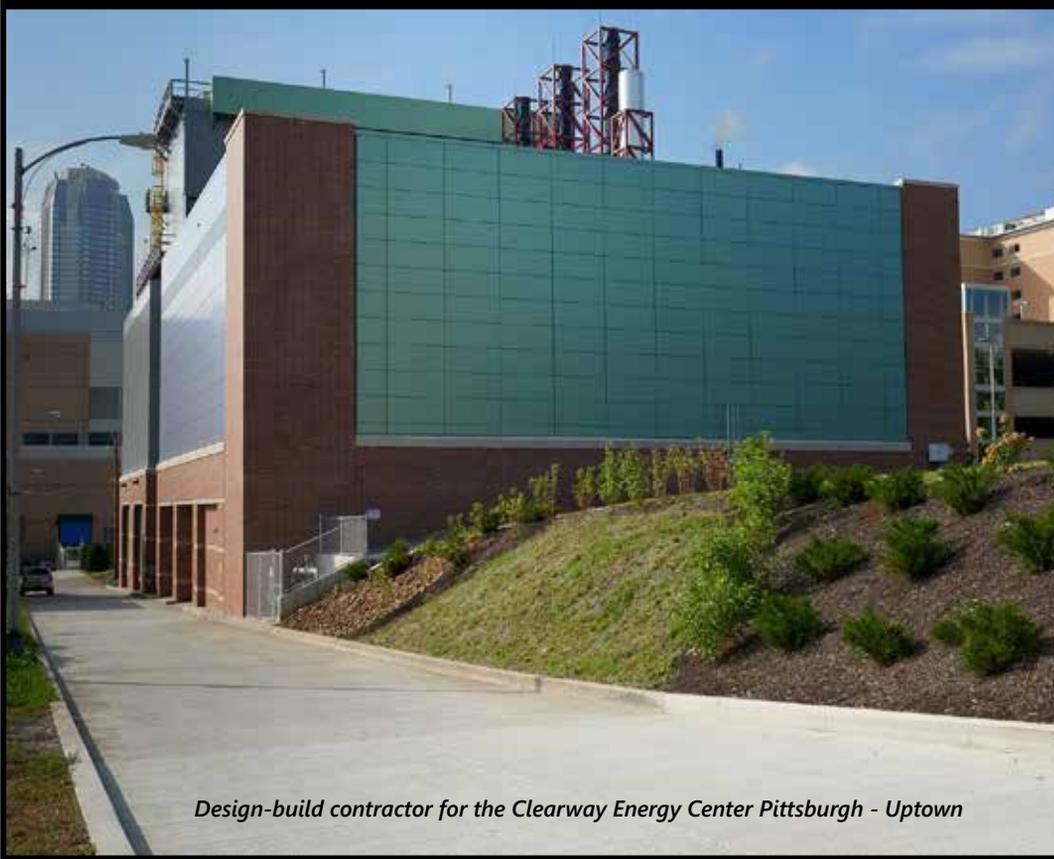
In total, Mascaro’s team installed nearly seven miles of pipes and electrical conduit. Those utility lines run south for five blocks. More difficult was the fact that the lines were going through two of the busiest streets in Pittsburgh, Forbes Avenue and Fifth Avenue, which were also the sites of some of the oldest residential neighborhoods in the city. As might be imagined, the City of Pittsburgh restricts work that might impact Forbes and Fifth at rush hour.

“It was challenging going through the streets identifying the utilities. Duquesne Light, Peoples Gas, and PWSA marked their locations. You try to follow the One Call markings and the as built drawings that are provided but you are lucky if you find 70 percent of what is actually in the street when you put a bucket in the ground,” Lochrane notes. “We had to be flexible with our engineers to move around utilities that weren’t shown or were shown in different sizes than reality. We had to wrap our lines around those obstacles with offsets that were different from what was designed. We constantly checked the steam pressure against the model that had a different design and different offsets.”



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To verify utility locations, and find unidentified utilities, Mascaro performed tests that Lochrane called “pot holing.” The technique involves drilling a 16-inch diameter hole through the asphalt and pumping water in the hole to evacuate all the debris until a pipe or vault is located. Lochrane says that sometimes they would find a gas or sewer line at five or six feet and other times they would go down 30 feet and find nothing.

Construction started on the project in March 2017. The planning that was done to get in front of the difficult connection to UPMC Mercy was undone before construction had gone very far. With the announcement of the UPMC Mercy Vision and Rehabilitation Hospital, the requirements for the Uptown Energy Center grew. Larger equipment was needed, and the design had to be modified to fit the additional capacity into a footprint that could not be expanded.

“The plant contains steam boilers and chillers, with emergency power generation capability,” explains Traugott. “It is fully redundant so there’s N+1 redundancy throughout the plant. There are dual compressor chillers so that if one of those compressor circuits goes out there is still half of a chiller available. There is enough fuel to meet the code requirements of 96 hours for the generators. The intent was for that added reliability and efficiency to be built into that plant.”

The structure is a steel skeleton with masonry exterior walls, in addition to the Kolorshift metal panels. The intermediate floors are poured concrete rigid enough to support the heavy equipment loads. The design of the building took advantage of the slope of the hill to create a basement level to locate transformers, ancillary equipment, and offices.

While the site gave the team the advantage of the slope, it was a challenge on other issues. The lot line-to-lot line entitlement meant that there would be little space to mobilize. And the stringent sound abatement requirements – that sound from the plant could not be heard beyond the property line – were more difficult to achieve with a building that occupied the site right up to the sidewalk.

“One of the biggest issues was how compact the site was. We did not have much lay down space, so we had to really coordinate the deliveries of all the equipment and materials,” says Lochrane. “It became even more congested when we were trying to skin the exterior while bringing in the boilers, chillers and piping. We had to do all that while maintaining the roadway access for PPG Paints Arena. The road that runs beside the site is the main access for all of the events and hockey games, and we could never shut that road down. We had to coordinate with them on a weekly basis.”

“The site was also scrutinized closely for sound,” Lochrane continues. “The walls are grouted concrete block. We had strict sound requirements that had to be met when the plant was fully operational. If you are standing outside



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today, you don't hear anything but the trickling of water from the cooling tower."

Lochrane notes that most of the area that was used for lay down was actually owned by the city, not Clearway Energy. When the project was completed Clearway was responsible for restoring that parcel by planting grass, landscaping, and creating seating areas, before returning the property to the city's control.

Team members agreed that the most difficult tasks of the project involved the integration of the infrastructure from the Uptown Energy Center with UPMC Mercy. Two major integrations were involved that required extensive integration with the many users at the hospital. First was the preparation for the chiller cutover that took place at Mercy during the winter of 2017-2018. The second was the final integration of all the Uptown Energy Center's systems with those of the hospital.

Coordination was extensive because it involved multiple layers of responsibility within UPMC Mercy. In addition to the UPMC project management team – including those at the Mercy physical plant – the Mascaro/CJL team had to coordinate with all the users at the hospital. During the preparation and the cutover there would be a period when service to the hospital's heating, cooling, and water systems would be down. The engineering of the work had to account for all the users at the hospital and attempt to anticipate system problems that might escape the users. Overlooking a pump or valve in the

existing systems could leave a critical area without water or heat. The construction team understood that they would own any mistakes or oversights of hospital staff once the integration was underway. There was even a bit of Murphy's Law that came into play.

"We had to tie in the piping for chilled water and there was only one weekend where the temperature got low enough that chilled water was not required for the operating rooms," recalls Traugott. "We saw this one weekend coming where we had from Thursday until Sunday with the temperature below 20 degrees. Wayne Crouse did an amazing job of getting in there and tying in new valves to set UPMC Mercy up so that, when the piping came in from Clearway the following year, they could complete the connection without disrupting the hospital further. All of the components were [at Mercy] waiting and it was basically all hands on deck to get everything cut in, tied together and re-filled."

"When we did our tie-ins with Mercy Hospital we had to coordinate with multiple mechanical contractors so that we did not shut any part of the hospital down," says Lochrane. "When we did our steam and chilled water connections in 2018, we had to work with a fully-functioning hospital. We had to coordinate with all of their users."

The Uptown Energy Center was built under an OSHA Partnership Agreement between Mascaro, its trade contractors and the

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Occupational Safety and Health Administration. Mascaro also made use of Predictive Solutions SafetyNet software to collect data throughout the job that predicted and prevented potential workplace injuries. The safety culture created on the project resulted in 67,378 hours worked without incident.

Mascaro’s design-build team made use of building information modeling throughout the design and construction phase. Mascaro ran clash detection models that Rick Avon says helped avoid numerous problems during installation. He believes that was a key to the project’s success. Avon also pointed out that the construction manager worked hard at the more traditional ways of running a job.

“Mascaro did a great job of managing the project. Their communication was outstanding,” Avon recalls. “I remember a meeting where new subs were coming on board. Not only were they told exactly what to do but Mascaro went around the room with every professional and the subcontractors were allowed to ask us whatever they needed to do the job. During the planning we had many meetings with the owner and the project team. Every issue was discussed and re-discussed until the right decision was made.” **BC**

PROJECT TEAM

- Mascaro Construction Co. LP Construction Manager
- Clearway Energy Inc. Owner
- CJL Engineering Design Engineer
- Avon Graf Architects Consulting Architect
- Atlantic Engineering Structural Consulting Engineer
- Civil & Environmental Consultants..... Civil Engineer
- A. C. Dellovade Inc.....Roofing/Siding Contractor
- Century Steel Erectors..... Steel Erection
- Wayne Crouse Inc. HVAC/Plumbing Contractor
- W. G. Tomko Inc.....Mechanical Contractor
- Clista Electric Inc.....Electrical Contractor
- Overhead Door Co. of Pittsburgh Doors
- Franco Associates..... Masonry Contractor
- HOFF Enterprises Inc. Casework Contractor
- McKinney Drilling Co.Drilling/Pile Driving Contractor
- Massaro Industries Inc.Ceramic Tile Contractor
- Butler Floor & CarpetFlooring Contractor
- Courtman PaintingPainting Contractor
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FIRM PROFILE

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RUTHRAUFF SAUER

Mergers are intended to marry two companies with complementary, if competing, strengths and weaknesses. Successfully merging two cultures is difficult. During integration, most mergers result in the ascendance of one culture over another. In many cases the cost-cutting that is the incentive for the merger creates an exodus of key staff. More than a dozen years after the merger of Ruthrauff Sauer, its president, Ray Gajski, offers a succinct assessment of the deal

“The merger has become everything we hoped it would, and more,” Gajski says.

The two companies, Ruthrauff Inc. and Sauer Holdings Inc., were both full-service mechanical contractors with long family business histories. William Sauer was a plumber who started his business in 1876, joining forces with John Steitz, a pump salesman, in 1906. Sauer and Steitz took advantage of the modernization of America’s homes to grow a plumbing, heating and air-conditioning business, eventually expanding into commercial work. The Steitz family led Sauer’s growth, and still leads Sauer Holdings today, as the company expanded south and west.

Jack Ruthrauff founded his refrigeration equipment repair business in 1934. Ruthrauff Inc. expanded into the commercial HVAC business in the mid-1950s, when Ruthrauff hired Nick Laux. Laux led Ruthrauff through the acquisition of plumbing contractor Coleman-Good in 1969 and the expansion into sheet metal and pipe fabrication in the 1980s. In 1989, Laux transitioned the company to its management team, led by Dave and Nora Faller, who led Ruthrauff into the merger discussions.

By the time the merger occurred in 2006, the two businesses were serving the market differently. Sauer was a multi-regional contractor with a significant share of its work in the public sector, often as a prime contractor. Ruthrauff focused its attention on the local Pittsburgh market and on the market niches it knew well. Sauer’s management saw the opportunities on the boards in Pittsburgh and was looking for a way to reestablish itself in its hometown and grow market share here.

Gajski says that the conversations about merging the two companies were initiated by the accountant they shared, Alpern Rosenthal (now BDO).

“Dave Faller and I had begun talking about transitioning the ownership. At the same time our accountant was also aware

that Sauer wanted to bolster its presence in the Pittsburgh market," Gajski recalls. "Sauer was aware that Ruthrauff was in touch with the market and on most people's short lists, but were limited in bonding capacity and financial capabilities. When everyone involved looked at it, there was a sense that we had the right combination. Ruthrauff had the position in the market that Sauer wanted and Sauer had the financial capabilities that could enhance Ruthrauff's position."

The timing of the deal was fortuitous on several fronts. Fuller was interested in retiring. Gajski and Ruthrauff's executive management had been preparing for a coming transition and the market was about to provide the opportunities for a profitable transition. Everyone involved in the merger got what they were expecting from the deal.

"The beauty of the merger was that the Steitz family knew what they were buying and it was exactly what they felt Sauer was lacking. I think they liked the fact that we had a highly-engaged management team that also had personality," Gajski says. "Bill Auth was still alive then. Billy was beloved in the industry. I think Billy insulted every one of our customers and they loved him for it."

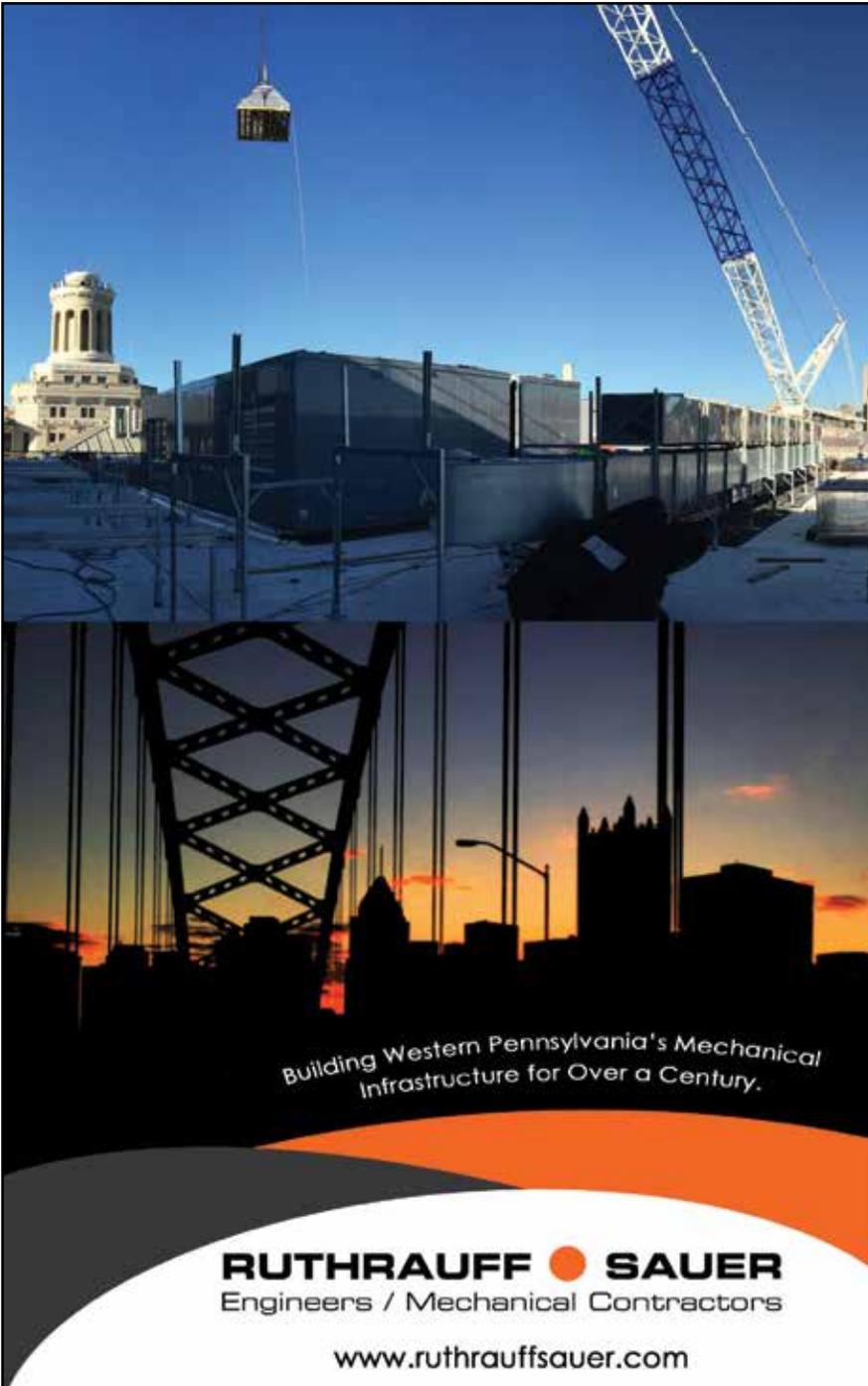
"The industry accepted us with open arms," Gajski continues. "During the next few years we were involved in some of the biggest projects in the region. We did Children's Hospital. We did the Rivers Casino. The merger was very well received and I give credit to the people in the industry for accepting us."

There were aspects of the two firms that required reconciliation. Sauer's projects were large public projects, which often required contesting disputes and filing claims. Ruthrauff looked for client relationships that lasted longer than the current project and that made them reluctant to litigate differences. Nearly all of Ruthrauff's management had started in their trades and that colored how they viewed the workplace.

For example, the decision to work close to Ruthrauff's McKees Rocks home reflects its executives' concerns about the field crews. Gajski says they are confident about what Ruthrauff's people are capable of and don't like to risk expanding into areas where they don't know the labor force well. Working in Southwestern PA also means Ruthrauff's crews are coming home each night instead of traveling. Gajski says that factor hits home with him.

"I traveled early in my career and for a young man with a family it was not fun. Our people get to sleep in their own beds at the end of the day. They have families. They are coaching soccer or softball or baseball in the evening after their work day is done," he says. "The other thing is that they are woven into the fabric of the region. Our people live in almost every community throughout Pittsburgh."

Ruthrauff Sauer maintains a field crew of about 230 people, which varies little with



the seasons. The split between the three main crafts – plumbing, sheet metal and pipefitting – is nearly even, with about 75 craft workers in each. The company has 40 people working in its offices and will do \$65 million to \$70 million in revenues. Ruthrauff Sauer's executive team includes CEO Bill Steitz, Gordon Collins, vice president of engineering, Mike Surunis, vice president of preconstruction services, and Robert Burger, vice president of operations, in addition to Ray Gajski.

Gajski's background is typical for Ruthrauff Sauer's management. He started as a steamfitter apprentice in 1975 and worked for both Ruthrauff and Sauer in the first decade of his career. Gajski was a project manager for Bryan Mechanical in the late 1980s and stayed with Bryan until he co-founded Mitsch Mechanical with Dan Mitsch in 1992.

"We were well received by the market but we were not prepared for the growth," Gajski admits. "We grew exponentially through the first five years but we were not financially prepared for that. You need a lot of money to finance a subcontracting business. We were young enough that we were able to close the door and pay everybody that needed to be paid. We didn't make any enemies in the industry, but it taught me the lesson that being good at your craft was not enough."

Dave Faller offered Gajski the opportunity to come on board with Ruthrauff as a manager and he has been there since 2000. Gajski says he learned another valuable lesson as he watched Faller steer Ruthrauff through a large claim, from which the surety company walked away. Ruthrauff went into Chapter 11 bankruptcy to reorganize and emerged from bankruptcy in just nine months in 2002 and 2003. Gajski had taken on the role of second-in-command during that period.

Those experiences, along with their time in the trades, have given Ruthrauff Sauer's management the strong belief that the company's success depends upon the workers in the field. That belief informs how Ruthrauff Sauer manages its projects.

"We try to eliminate the frustrations. Crafts people need the right equipment and the information they need to do their job properly. We make sure they have that," Gajski says. "All this comes from the fact that all of our project managers dealt with the same frustrations when they were in the field. A crafts person's nature is to get the work done. At the same time if you don't give them what they need they will find something to occupy their day!"

Ruthrauff Sauer also likes to empower its project managers. The company eschews having a central purchasing department, opting instead to have each project manager do the purchasing for their project.

"The problem with having one person responsible for all the purchasing is that vendors and subcontractors can become more responsive to that individual, rather than the project manager," says Gajski. "But it is the project manager who was responsible for putting the project together and keeping the client happy. By the

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same token, if the project manager awards the contract they have no excuse if there is a problem.”

Keeping the client happy is a key metric of success for Ruthrauff Sauer, whether the client is a general contractor or an end user. Project managers and field crews are expected to find solutions that keep their customers happy, rather than problems

“Great workers have an extra gear and they can find it when they need it. We like superintendents who push us. Our people are up to the challenge.”

that might result in revenue for Ruthrauff at the expense of the customer. Because a significant share of its work is design-build and/or privately-owned, Ruthrauff Sauer feels that it has the responsibility to own the solution. Its managers feel that makes for long-term customers.

The current market conditions have been good to Ruthrauff Sauer. The company is working on the UPMC Mercy Vision and Rehabilitation Hospital and has prepared to have the resources available to take on more of the big projects that are in the pipeline in Pittsburgh. Because of Shell’s petrochemical plant in Beaver County – and its heavy reliance on mechanical trades people – Ruthrauff Sauer’s executives have had five years or more to prepare for the coming wave of commercial and institutional projects. They are approaching the market with a conservative approach to growth, which meant passing on most of the opportunities at the cracker project.

“I think it’s better to stick with the things that you are experienced, and have expertise, doing. Could we hire those kinds of workers and adapt to that kind of work? Sure, but there are plenty of opportunities for work in the things that we do best,” Gaski says.

“You don’t want to out run your headlights or outgrow your labor. That’s the key for us. We believe we can comfortably grow by 20 percent during this time. We believe we can attract more talent to the organization to accomplish that. But I think anything beyond that borders on unhealthy. That probably means something on the order of six-to-eight percent per year.”



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That approach to a boom market seems like it might mean missing out on a chance to grow more rapidly but Ruthrauff Sauer's management isn't convinced that the skilled labor available will allow contractors to take on significantly more work without increasing the risk of performing well. Gajski says their project managers know they will have to stretch the people in the field to get everything built over the next five years. And they expect their customers know that too.

"It's sort of like how you build a football team. You create enthusiasm for the work that is done in the field," he says. "You make the craftsman so proud about what they're doing. That pride drives a craftsman to be productive, to deliver quality, and to be a great representative of their craft and company. Great workers have an extra gear and they can find it when they need it. We like superintendents who push us. Our people are up to the challenge." **BG**

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LEGAL PERSPECTIVE

WORKING WITH LOCAL MUNICIPALITIES: AVOIDING POTENTIAL PITFALLS AND TIPS FOR SUCCESS

BY LAWRENCE J. MAIELLO, ESQ.

The legal framework regulating Pennsylvania oil and gas operations is dauntingly complex. Trying to navigate the ever-changing guidelines can be challenging and laborious. But that shouldn't discourage construction, waste disposal, trucking, and drilling companies from paying close attention – because the burden of compliance with Pennsylvania's various oil and gas regulations will undoubtedly fall to them. These industries are on the front lines of fracking controversies. In order to help alleviate that burden, we have outlined potential challenges alongside several tips for success, specifically when working with local municipalities on oil and gas projects.

BACKGROUND

For well over a decade, unconventional oil and gas operations, also known as "fracking," have been a huge driver of economic activity throughout Pennsylvania. Since 2000, it is estimated that over 21,000 wells have been drilled throughout the Marcellus Formation. Those wells have generated substantial business for the construction, waste disposal, drilling and trucking industries.

Shortly after its introduction, fracking became a source of opposition, controversy and lawsuits. One focal point of the debate: Should fracking be constrained to industrial areas or open to occur in rural areas within local municipalities?

Several lawyers, including members of the Pennsylvania Supreme Court, have argued that fracking should be limited to industrial areas because of the heavy noise and pollution that occur during wellpad construction – the initial phase of development. Such opinions stand in stark contrast to 50 years of Pennsylvania land use and zoning law, which has historically only considered effects that arise after construction is complete, not those that occur during initial construction. Once in production, a well pad is fairly unobtrusive.

The resulting series of laws and court decisions have taken the construction, trucking, waste disposal, and drilling industries on quite a ride. One minute they are enjoying privileges that few other industries have ever enjoyed, and the next they are subject to special rules and restrictions that apply nowhere else. Ultimately, oil and gas law in Pennsylvania has been shockingly unstable, with new decisions coming down every year, some of which radically overturning existing rules.

While we cannot know for sure whether the uncertainty is behind us, over the last several years, court decisions seem to have stabilized around the notion of "local control." Local municipalities have been granted extraordinary rights to regulate oil and gas – seemingly beyond their ability to do

so in any other industry. Given the authority that has been granted to local municipalities, some of the most important people involved in the success of your oil and gas projects will be the elected officials in any given community.

POTENTIAL PITFALLS AND TIPS FOR SUCCESS

1. Your costs, time and legal requirements for doing any work may vary dramatically from town to town.

Since local control is key, two sites practically side by side may have wildly different requirements that you must comply with. In one town, you may be required to coordinate with local school districts to not interfere with school buses, while another town may not have that requirement – even if the two municipalities are in the same school district. Some municipalities may require air quality monitoring or only allow electric equipment to be used. Hours of operations may vary in different locations – the list goes on.

Tip for Success: Carefully review any local zoning ordinances before bidding on a project and be prepared for those requirements to expand if oil and gas operations are denoted as "special exceptions" or "conditional uses" within the zoning ordinances. In those cases, a hearing will be held and the board may impose additional conditions.

2. Zoning ordinances can change at any point in time.

As with many other local regulations, zoning ordinances are subject to change as a result of any related board rulings. One day, a local zoning ordinance might be considered favorable for an oil and gas project and the next day a new ruling could make the ordinance less favorable for one reason or another.

Tip for Success: If the current zoning ordinance is favorable, make sure your application is filed as quickly as possible. Any application is governed by the ordinance in place at the time of filing.

3. Community involvement can derail projects. .

The bulk of complaints from community members are in regard to noise during the hydraulic fracturing process. Other complaints may relate to air quality and potential water quality issues.

Tip for Success: Being prepared to deal with those issues at the start of any given project may head off further opposition. Be accessible to the community.

Be prepared to deal with conditions that relate to air quality, water quality, and sound.

4. Unforeseen conditions can make budgeting difficult.

The truth is the cost of these projects can be very difficult to predict. It becomes easy to overpromise and under-deliver. If the ordinance makes oil and gas operations a special exception or conditional use, any price estimates or contracts must take into account the risk that other conditions may be applied after signing.

Tip for Success: Put plenty of contingencies in your bid in case of unexpected conditions or delays. Carefully document in all contracts the party that is responsible for any delay damages, especially if the application process is in the hands of the energy company's attorney. Don't get stuck holding the bag.

5. State and federal regulations add additional layers of red tape.

Local municipalities may impose conditions without fully understanding what is feasible or permissible under state or federal rules. State permits for well pad construction may impose limits that make compliance with local ordinances difficult. For instance, if your state permit does not allow you to engage in operations outside of the permit area, but the town wants you to landscape outside of that area, be prepared to address that with the local board.

Tip for Success: Make sure you are aware of any state permit requirements. Have a pre-application meeting with local officials to learn if there are any specific concerns. Be prepared to educate local officials of state and federal laws, as this may be their first time dealing with a wellpad in their community.

6. Varying local rules require unavoidable, time-consuming review.

Zoning ordinances are not the only local rules that require attention. Ordinances within any given category can vary from town to town and any unique requirements necessitate an in-depth review. For example, does the

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municipality have a subdivision and land development ordinance? If so, you may be required to receive a separate land development approval on top of any zoning rules.

Tip for Success: Keep an eye out for any potential roadblocks. Review any previous approvals by the municipality. It is likely that any conditions present there will be imposed on your approval as well.

CONCLUSION

When controversy erupts around fracking, never forget that nearly all of the compliance burden and any subsequent issues fall to the companies in charge of constructing and drilling the well pad. The energy company that will make money for the next 40 years selling the natural gas during the quiet production stage has a different set of concerns. You can't rely on the energy company to meet all of the requirements triggered by local ordinances.

The unfortunate truth is, while there are steps you can take to mitigate your risk – many of which we outlined above – you may not know what you are getting into until the process is well under way. You may have a board that seems friendly, but suddenly turns hostile after public pressure starts to come their way. You may find well-funded community groups filing challenges to approvals, even after they have been granted, or challenging the zoning ordinance you were already set to comply with.

Be prepared, follow the tips for success, and you may find yourself positioned for significant growth in the oil and gas arena. Despite today's historically low gas prices, new pads are still being built. However, if you fail to do your homework you may find yourself losing time and money that you can't get back. When in doubt, consult an experienced oil and gas attorney to help you navigate this complex and evolving regulatory landscape. **EG**

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FINANCIAL PERSPECTIVE

SURETY MARKET UPDATE

It is a tried and true market scenario as dependable as the sun coming up in the east. As the business cycle extends, contractors get busy and become more profitable. Insurance companies are attracted to the surety market in greater numbers. Increased competition leads to a soft market, with underwriting standards gradually declining to attract business. When the inevitable downturn occurs, the insurance market turns upside down. This scenario has played out dependably over the past few decades. But there is little evidence that this is the arc of the surety market right now.

As 2019 winds down, the construction market is in a period of extended expansion. The overall economy is showing signs of slowing down, a sign that the construction market may hit choppy waters in the next couple of years. The insurance market, however, has behaved very differently from past business cycles. That's a very good thing for construction companies in the near term, but it also bodes well for the industry over all when the current wave ebbs.

Surety companies are making profits. Loss ratios remain low. Bonding agents and brokers are seeing higher volumes. Contractors are having no problems finding bonding capacity. The forecast for the surety market is blue skies ahead. There are some clouds forming on the horizon, however, that those in the business aren't ignoring.

There are conflicting, or at least uncertain, signals coming from the industry. As the expansion has lengthened in years, capital and capacity have been added to the surety market. Healthy profits have allowed for losses to be absorbed, but those losses have gotten larger. Consolidation within the industry and new entries into the markets are creating uncertainty, and are creating new competitive pressures. All of these developments are warning signs of a sort, indicating that sureties may not be the safety net the industry expects.

One concern that is being echoed throughout the surety marketplace is the labor shortage. Performance bonds make up the largest piece of the construction bonding pie and the risk of failure to perform grows when labor is tight. Matt Mairn, bond manager for Liberty Mutual Surety, says that the availability of skilled labor has been a main topic of concern at every meeting he's attended for more than a year. Jay Black, partner at Seubert & Associates insurance agency, notes that workforce limitations make it almost impossible to find a contractor willing to take over a project that the bonding company has enforced.

Professionals in the surety industry also bemoan the heightened level of competition within the surety market,

as more companies have entered the bonding business. It was a rush to soak up surety premiums after the disaster-related property and casualty losses of the early 2000s that led to the massive surety losses in 2004 and 2005.

For the time being, however, the underwriting standards that insurers are using to evaluate risk remain largely unchanged. The hard lessons learned in 2003-2005 seem to have been baked into the underwriting departments to this day.

"Our underwriting standards are consistent with what they have been. We are still writing with a focus on net worth, working capital, cash flow, and debt," explains Mairn. "Those are still the same main things we are looking for when we are underwriting a contractor on an individual basis. Given the booming construction market, there are companies with higher backlogs than normal right now. Debt and cash flow are the factors we are looking at more closely now. If there is a problem with a company it is usually caused by problems with cash flow."

"In the Pittsburgh market, the balance sheets and financial performance of contractors has been very strong. Most companies are profitable," notes Bly.

What concerns industry veterans is the relaxing of some of the conditions – capital requirements, bonding limits, and personal guarantees – that signal that the insurers could get more aggressive. Better conditions for contractors are the byproduct of increased competition among insurers.

"It's a very competitive market right now. Sureties are looking for business and there is a lot of capacity. It's one of the more competitive markets that I've seen in my 45 years of doing this," says Ed Rawlings, principal at Liberty Insurance Agency (not related to Liberty Mutual). "Sureties are being more flexible on terms, rates, and capacity than they have been in a long time."

"We are telling our clients to take advantage of the market and get enough headroom on your bond program right now because capacity is there and the terms are as soft as they have been in a long time," says Jim Bly, managing director

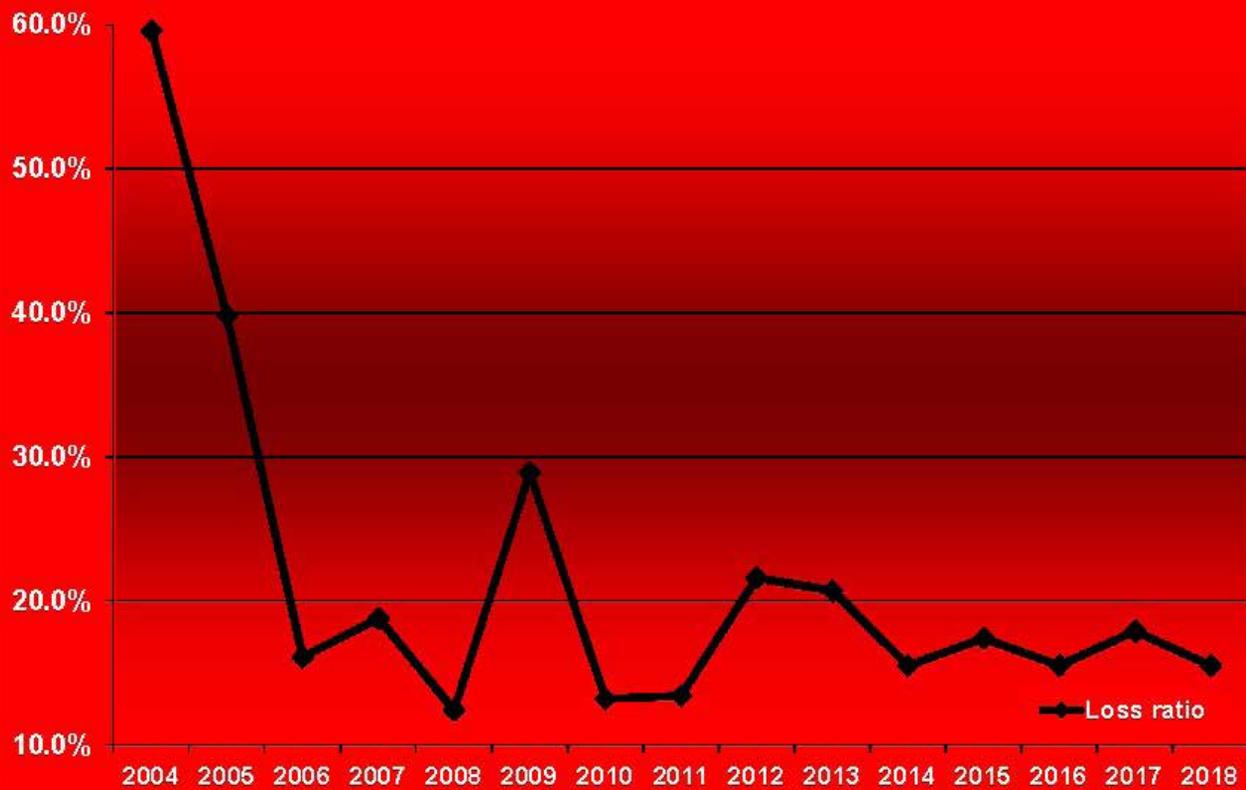
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Surety Loss Ratio Trend



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Increased competition is but one characteristic of the surety market in 2019. For a decade after the disastrous 2004-2005 period, the insurance industry retrenched. New products were introduced to create alternative strategies for mitigating the risk of non-performance. Owner-controlled insurance programs gained a bigger share of the marketplace. Subcontractor default insurance (SDI) was one of the innovations. Over the past five years, as the industry enjoyed stability and growth, insurers began to employ different strategies to gain market share or grow premiums.

"One of the interesting things to report about the market is the merger and acquisition activity. We have had three since April," says Black. "Liberty Mutual, the number two surety, bought Amtrust the number 23 surety. Sampo, which is the ninth largest surety, bought QBE, which is the 51st surety. And One Beacon that was number 19 bought Guarantee Company, which was number 20. Their combined \$265 billion in writings makes them the sixth largest surety."

Black believes that merger and acquisition activity may not be over. He sees the activity as a growth strategy, rather than a response to competitive pressures.

"It's been competitive for a number of years. The mergers are more a result of the market being so good that companies want to have more of it," he says. "Surety companies make money during good times and these have been good times. They also know the cycle is unavoidable and worse times are going to come around again."

The marketplace for SDI also changed. In 1996 when the concept of general contractors bonding their subcontractors as an alternative to a performance bond to the owner became a product, it was introduced by Zurich Insurance. Zurich had the market to itself for 13 years, when other major insurers began introducing SDI programs. Over the past few years, Zurich has suffered several huge losses. A half-dozen insurers rushed to fill that void. Bly sees that scenario as a guard rail for the industry.

"You will get fresh capital in the market. Because the industry has been so profitable if there is a crisis there will be new capital coming into the market," Bly says. In 1988 when we had significant surety losses here in Western Pennsylvania, Aetna [who had the big losses] tightened up and the rest of us expanded. The opportunists with capital will take advantage of those kinds of market conditions to expand. And there is so much capital out there right now.

"There's enough capital that a crisis wouldn't freeze the market like in 2004, when five of the top 20 sureties

exited the market. There were a lot of contractors that lost bonding.”

Contractors are the fuel for the market today. Construction opportunities have grown steadily since 2014. Coming out of a deep recession, contractors were lean and became more profitable as the market expanded. Executives paid attention to the financials of their businesses and that made it easier for surety companies to add to growing contractors’ bond programs.

“In the Pittsburgh market, the balance sheets and financial performance of contractors has been very strong. Most companies are profitable,” notes Bly. “Whereas 15 percent of the contractors may lose money in a given year in a slow market, fewer than ten percent had losses in 2018. The agents expect that those numbers will hold or improve in 2019.”

Alliant Construction Services has developed a credit model that it uses to analyze subcontractor financial performance across the U.S. The financial performance of the 2,400 subcontractors in its database improved in 2018. Balance sheets were stronger. Margins were higher. One telling metric was a slowing rate of revenue growth, which Bly thinks is a reflection of subs getting pickier. Alliant’s model is part of another industry trend.

“The sureties are becoming a lot more analytical,” Bly says. “They want financial reports on a timelier basis. They want to know what the contractor’s

processes are for risk management, quality control, or subcontractor pre-qualification.”

“Analytics are definitely part of the process. With the amount of data that is available in the market and systems you have access to it, analytics are important,” agrees Mairn. “At Liberty Mutual we look at that as a tool in the decision making process to approve a bond. It gives you a greater understanding of market trends across many regions and types of business. And it can show us things that have the potential for a slowdown, based upon the intelligence that we’re gathering from multiple sources. Underwriting is a blend of art and science. Predictive models can be one tool that guides underwriters as they look at a particular opportunity.”

When business cycles get long in the tooth, it is the art side of the underwriting recipe that companies expect from their local representation. With the changes in the lineup of surety companies increasing, Mairn emphasizes the need to have long-term relationships with an agent and a surety company. Jay Black suggests that mergers can complicate those long-term relationships.

“Mergers cause disruptions in the market. As agents our job is to have great relationships with the surety companies and that takes time. Mergers and acquisitions disrupt those relationships,” he says. “It’s not always true but typically in a merger, one company’s underwriting appetite wins out over the other. Overhead is consolidated and people get down-sized. People jump ship when they think downsizing is inevitable.



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It means instead of having two companies that might serve a client, there is now only one."

Black doesn't believe consolidation will harm contractors. In fact, he says that mergers usually make bonding decisions go smoother.

"The merged company is not looking to make waves with existing customers," he says. "You don't sweat being able to find bonds for your customers. You worry about whose philosophy is going to win the day."

As loss ratios for the industry remain low, and well below the level that would erode profits, the number of major losses is on the rise. Several large international construction management firms entered the U.S. market during the 2010s to take advantage of huge infrastructure projects and private-public partnership programs. Many have found that their aggressive bidding led to losses. As strong as 2018 was, there was an uptick in losses in the \$10 million and under range. And in each of the last two years, there were catastrophic losses in Canada and the U.K. that caused a ripple in the industry.

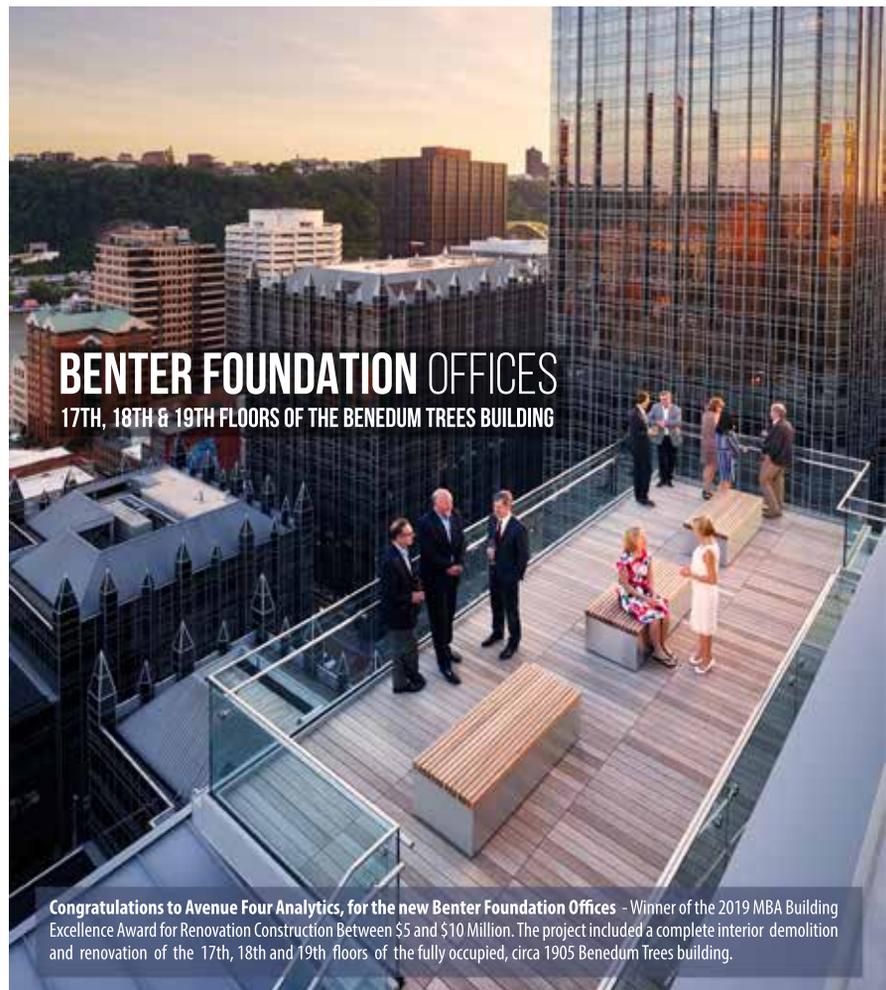
One veteran bonding agent sees the market as strong and cautious at the same time. Bob McCarthy, owner of the Robert C. McCarthy Agency, worries about signs that owners are becoming more relaxed about bonding projects, even as his contractor clients are tightening their risk management.

"I am seeing more general contractors requiring subcontractor bonds while I am seeing more owners who are waving performance and payment bonds. It's an odd dynamic," says McCarthy. "Owners that do that may not understand the 2007 Pennsylvania Mechanics Lien law or the value of a maintenance bond. Owners may be correct in choosing general contractors that will not cause a performance or payment issue; but if payment issue arises because of a dispute between a vendor and a subcontractor the building can be liened. I think the lien law is rather significant."

A compromise on a bond is a small thing but it's the compounding of the small compromises that more

experienced surety professionals are wary of at this point. Surety companies are hungry for more premiums. Contractors are in a position to ask for concessions on cash reserves or personal guarantees. No one sees the industry loosening its standards today, but many see the conditions ripening for a harder market.

"I believe we're going in that direction but we're not near there," says Ed Rawlings. "The contractors are all doing well, but if the economy changes and it becomes a tough market for contractors, it will start to impact the surety companies." **BG**



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MANAGEMENT PERSPECTIVE

UNDERSTANDING EVENT-DRIVEN LITIGATION RISKS: IS YOUR ORGANIZATION PROPERLY COVERED?

BY CHARLIE SALAZAR

In recent years, businesses and organizations have come to realize that their Directors and Officers (D&O) liability policies may not cover them, or their directors and officers, against a relatively new phenomenon known as “event-driven litigation” (EDL).

EDL is often prompted by emerging risks that by their very nature are difficult to understand, predict or insure, leaving companies vulnerable to uncovered losses if EDL should arise. As several high-profile cases have recently revealed, EDL can result in judgements in the millions of dollars and lead to business interruption and long-term reputational damage. For these and other reasons, it is critical for companies to become familiar with this current business reality and take proactive steps toward minimizing their exposure to EDL-related damage and loss.

Coined by the U.S. Chamber of Commerce’s Institute for Legal Reform, EDL generally describes any litigation that is not accounting or financial in nature. Often prompted by an unforeseen emerging risk and accompanied by allegations of corporate mismanagement, EDL events frequently fall into these three highly publicized categories:

- Sexual Misconduct (#MeToo/#TimesUp)
- Climate/Environmental
- Cyber/Privacy

In the last two years alone, lawsuits arising from sexual misconduct have been brought against the directors and officers of several large organizations including Nike, National Beverage and Wynn. Climate and environmental suits have affected companies like PG&E, as well as businesses that are outside of the Oil & Gas sector. Lawsuits related to Cyber and Privacy liability have stemmed from multiple areas including mergers and acquisitions oversight, subsidiary organizational preparedness, and insufficient disclosure, recently affecting Yahoo, FedEx and other large national organizations.

Many of these cases have resulted in heavy judgements and extensive legal costs for the companies involved, along with widespread negative publicity. These examples

pertain to larger, well-known organizations that are often in the media. However, companies of smaller stature and lesser notoriety can also be affected by emerging risk and EDL. As statistics released by the U.S. Equal Employment Opportunity Commission reveal, charges related to sexual harassment in the workplace increased by 13.6 percent between 2017 and 2018, the year immediately following the rise of the #MeToo movement. No matter the size or type of organization involved, without appropriate insurance coverage, all organizations are vulnerable to EDL-related loss.

Event-Driven Litigation Optimization Review

As EDL and corresponding costs become more pervasive in the business world, companies should be reviewing and evaluating their existing D&O coverage and exposure to potential risks. The review should focus on:

1. Current policies against emerging risks,
2. Identifying appropriate forms of coverage, and
3. Advocating for the most competitive terms and pricing.

The review process should also include the evaluation of an organization’s current business practices addressing these risks, including the way in which it discloses information to employees, shareholders and regulators. This process will help companies refine and improve their current procedures, in addition to determining the most appropriate method of communication among internal and external constituents.

Mitigating the Risk

Emerging risks can arise when least expected and lead to costly Event-Driven Litigation against companies and their directors and officers. For these reasons and more, it is vital for organizations to become familiar with this new reality and take proactive steps to mitigate their exposure to potential EDL-related damage and loss.

As an example, consider a construction company that’s looking to protect themselves from a potential EDL

exposure by making sure their current D&O program would properly protect them in the event of a loss.

Working with their insurance broker, the company requested an EDL optimization review, through which they were able to identify and address several potential exposures in their existing D&O and employment practices liability policies.

In the months following, the company was subjected to various lawsuits, including employment practices lawsuits filed by a group of 12 current and former female employees. The suits involved breach of duty allegations against the Board of Directors, with the women claiming that the Board knew they were being subjected to sexual misconduct by two senior managers over a period of several years.

As the litigation process ensued, the company's combined D&O and Employment Practices Liability (EPL) losses, totaling over \$700,000 with projected future losses in excess of \$3 million, will be covered under the D&O/EPL program designed. Had the policies not been reviewed, the outcome would have been a costly one.

The question remains, are you properly covered?

Charlie Salazar is a vice president in USI Insurance Services' national construction practice, based in Pittsburgh, PA. Charlie can be contacted at Charlie.Salazar@usi.com or 412-430-6092.



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TREND TO WATCH

DIGITAL TECHNOLOGY AND VIRTUAL REALITY: SCAN TO BIM

BY MARK DIETRICK

Reality computing is the process of using either laser scanning or photogrammetry technologies to digitize existing environments and using the resulting data to visualize, analyze or create information models more efficiently and accurately than through traditional surveying methods. Rapid advancements in reality computing technologies and the reduction of cost have accelerated adoption in the architecture, engineering and construction (AEC) industry. The demand for reality computing has risen from 20 percent in 2016 to 57 percent in 2018, according to the 2019 Survey & Mapping Deep Dive Laser Scanning and GIS CLEAReport. In a very short period of time we have witnessed reality computing become quite commonplace in the industry, bringing much value to many complex industry processes.

With the introduction of the BLK 360 scanner from Leica Geosystems in 2016 at a price point approximately one quarter of most other scanning solutions on the market, laser scanning suddenly became affordable to many companies. Furthermore, Leica's partnership with Autodesk made the process of getting scan data into the ReCap format, which is supported by all of Autodesk's authoring applications, efficient and simple. While not considered a "survey grade" scanner, the BLK 360 provides enough accuracy for most AEC applications and has become a game-changer, thrusting scanning into the mainstream of the industry for many design and construction firms.

On the other end of the spectrum, mobile scanning systems are now being used to accurately digitize large existing sites for infrastructure projects. While still very expensive (costing generally above a half million dollars), mobile scanning solutions are bringing incredible value to the civil and environmental industry by accurately digitally capturing vast areas in the fraction of the time and cost of manual methods.

The following are examples of some processes that we are now seeing fairly common use of scanning today, providing much value to the AEC industry:

Documenting Existing Conditions

Certainly the "low hanging fruit" application of laser scanning is to digitize an existing facility into a point cloud and then utilize the data to produce drawings or a Building Information Model (BIM). On most renovation projects, laser scanning is much more efficient than traditional surveying. On a recent project, for example, a 55,000 square foot facility was scanned and processed in four days, compared to an estimated eight

days to survey with a hand-held laser. Moreover, the point cloud contained much more accurate measurements of all visible building elements, whereas a traditional survey would likely only contain measurements of major architectural elements required to produce floor plan drawings.

In most cases, point clouds are simply used as underlays in software programs, allowing the user to "snap" CAD or BIM objects accurately in place. However, new tools are quickly being developed, mostly as add-ins to CAD and BIM software, that automate the creation of geometry or objects by classification of the point cloud. These tools work by recognizing the shape of elements such as beams, ducts, pipes, etc. within the point cloud and automatically creating the corresponding CAD geometry or BIM objects. While certainly still far from a one button push, creating drawings and models from scans is becoming much more efficient and will become more so as these technologies develop in the future.

Construction Coordination

On many renovation projects, BIM's are not provided for some or all existing conditions, but are provided for new building systems. Point clouds of existing conditions may be composited with BIM's of new systems and coordinated through clash detection software. As with all BIM coordination efforts, being able to find and resolve conflicts prior to fabrication and installation makes for a much more efficient construction process.

Scanning Throughout the Construction Process

There are some very compelling uses of scanning in other areas of the construction process.

Certain building systems, for example, are fabricated to very precise tolerances. This requires that the fabrication information be produced only after framing and/or the substrate has been constructed. This process can result in significant waste if the dimensional data used in the fabrication process is not precise, which would cause elements to be re-fabricated. If scanning is deployed as an integral part of the construction process, very precise dimensional data may be produced quickly and just at the right time to produce the information required for fabrication, greatly reducing the chance of error.

Case Teechnologies is currently consulting on a project where a water leak has caused damage to a series of ornamental plaster column capitals and fluting. While the shape of the

ornamentation is still intact, all of the plaster will need to be replaced. To reproduce the plaster elements, high resolution scans will be produced of the ornamentation. Working with a three-dimensional printing company, replacements will either be “printed” with a resin material, or plastic molds will be “printed” so the replacements can be cast. Regardless of the solution chosen, either method will be more efficient than recreating the plaster elements by hand. This approach will become even more commonplace as three-dimensional printing and automated fabrication technologies continue to develop and are used more widely for the production of different building systems.

Finally, scanning is being used regularly throughout the construction process for quality control and to three-dimensionally document as-built conditions. Building Information Modeling is now regularly being used by construction managers and general contractors to better coordinate system installation and sequencing by the specialty trades. While it is hoped that the BIM’s are precisely followed by all trades, inevitably that will not happen in all instances. If scanning is used in the field as an integral part of the process, automated comparisons may be made between the as-planned BIM and the as-built point cloud and potential problems can therefore be averted.

Scanning in the field before ceilings or drywall is installed also provides an accurate record of all systems that will be hidden. This is a great value where BIM is not used and, when BIM is used, will record elements that may not have been included in the model. Not surprisingly, some owners are now asking for this service as part of the as-built deliverables.



Many infrastructure projects see great value in scanning throughout the construction process as well. In addition to the processes already mentioned, a specific application used commonly is comparison scanning on earth and road work, which enables automatic calculations of volumes of material removed or installed.

Exciting New Capabilities

One of the major challenges with laser scanning is being able to effectively use the resulting data to visualize existing environments and efficiently use it to produce Building Information Models and/or civil topographic models for analysis and documentation. The result of such a scan is a point cloud which contains billions of points recording positions on surfaces. Most scanners also produce panoramic photography which is utilized to colorize the point cloud. Because of the vast amount of points, it is difficult to perform real-time navigation to be able to explore the point clouds with a high level of visual fidelity and the resulting massive file sizes make it extremely difficult to share.

An interesting new technology called Cintoo attempts to solve this problem. Cintoo is a web application which converts the point cloud into a textured mesh model, a much more efficient format that is commonly used to produce video games. The scanned project, once uploaded to Cintoo, may then be viewed and navigated in much higher fidelity through just a web browser and even supports virtual reality headsets.

This technology also supports a better “Scan to BIM” approach as you may define a specific three-dimensional area of the scan, which may then be downloaded and used to create the model of existing conditions. This solves the problem many have had in creating models using point clouds that contained too much data. This app allows the BIM to be uploaded to the Cintoo project and compared to the scan for accuracy. BIMs of proposed new features can also be visually analyzed.

These exciting advancements combining scanning, modeling and virtual reality allow for potential occupants, buyers, owners, contractors, or designers to view the existing or improved space virtually without having to interpret drawings or model into reality. Existing conditions can be evaluated for conflicts, safety considerations, productivity, occupant suitability, occupied condition, etc. through virtual visual inspection. Decisions about the myriad issues caused by existing conditions can be resolved during design/programming instead of during construction.

Mark Dietrick, AIA LEED AP, is director of services for Case Technologies. He can be reached at mark.dietrick@casetech.com.

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BEST PRACTICE

FROM DEMOLITION TO DECONSTRUCTION: CITY SALVAGE AND RE-USE POLICIES



Cities around the nation are currently facing growing numbers of old, inefficient, and deteriorating structures in their communities. Owners of these buildings often turn to demolition because of the impractical costs of renovation. However, frequently these older homes are made of quality or historic materials that go to waste because demolition sends them straight into a landfill.

Deconstruction is a process that can salvage waste from demolition while simultaneously contributing to a city's overall sustainability goals. The deconstruction process involves taking apart an existing building element by element in the reverse order of its construction to preserve or recycle as much of the materials as possible. Those salvaged materials can then be transformed into profitable resources, sold for future construction projects or to repair and restore similar homes that remain.

BENEFITS OF DECONSTRUCTION

Deconstruction benefits more than just the environment – the process can help protect public health by reducing the airborne toxic pollutants associated with demolition, create employment and new economic opportunity, foster the creation and expansion of small businesses that handle salvaged materials, and provide local and affordable access to building materials in the event of a disaster.

According to the Delta Institute, deconstruction can offer several environmental, economic, and community benefits for cities with high vacancy and unemployment rates. Those benefits include:

Environmental Benefits

- Reduced toxic dust from job site
- Reduced heavy metal leaching into soil
- Reduced waste to landfills
- Reduced consumption of new material

Economic Benefits

- Jobs from removing structures
- Resale of affordable building materials
- Sale of value-added products

Social Benefits

- Removal of blight
- Workforce development partnerships
- Workforce training and contractor training
- Local reclaimed materials that can be used in the restoration and preservation of historic structures.

Because cities are usually responsible for issuing demolition permits and for oversight of the demolition process, the city

has the power to construct and implement a deconstruction policy. A deconstruction policy defines minimum requirements for covered buildings to be deconstructed rather than demolished through the standard procedure. These policies can be the responsibility of different city departments, like an office of historic preservation or an office of sustainability, but as with any good policy, it is important all relevant departments be involved in the planning process. For example, the engineering, planning, and building permit offices would likely be involved, but so should a public works, solid waste department, economic development, environmental protection, and others.

IMPORTANT CONSIDERATIONS

Deconstruction has many benefits, but because the process involves more planning than standard demolition and each city's specific needs are different, there is no one-size-fits-all policy. Drawing from research and discussions with experts, below is a list of important considerations when creating a deconstruction plan.

1. Calculating Impact

As with any successful building policy, a first step to consider is the scope of buildings that will fall under the deconstruction policy. The goal is for the number of affected buildings to be enough to make an impact, but also not so much that the policy – and the resulting materials saved – will overwhelm the system or local capacity.

Investigating the inventory of targeted buildings by their construction date could help cities better calculate a reasonable number of structures the policy will apply to. For instance, a policy that applies to all homes and duplexes constructed prior to 1960 may encompass too many existing buildings in the city. This could put strain on local contractors, create an inventory of too many materials to realistically salvage or recycle, and lead to an administrative burden beyond what the city can manage. A helpful place to start is the list of demolition permits issued over the previous several years. Cities can use this data to predict potential impact by calculating what percentage of the projected number of future tear-downs each year would require deconstruction under the new policy.

2. Preparing the Industry

Because deconstructing buildings is more labor and time intensive than the standard demolition process, a deconstruction requirement can create burdens on local contractors. Existing contractors will likely need training in deconstruction techniques and cities can help ensure that there is a large enough pool of professionals who can perform deconstructions. The city could offer free workshops, by partnering with organizations such as Build Reuse, to certify contractors to take part in the



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deconstruction process. Build Reuse also offers other training opportunities such as community-wide forums that bring together and educate community leaders and organizations that will be the backbone of a successful deconstruction policy.

Creative incentives from the city could also help relieve some of the greater cost burden, like offering a certain tax rebates or expedited permitting and plan reviews for companies that participate in deconstruction training.

3. Planning for Material Inventory

Deconstruction means giving building materials a second life. A successful deconstruction plan does not end once materials are kept out of a landfill; it is most successful when those materials are recycled or reused in future projects. Having a plan for those materials is one of the most important considerations for any city contemplating a deconstruction policy.

Creating a system and setting up the infrastructure for collecting, storing, organizing, and reintroducing the salvaged materials back into the marketplace is essential. Storage locations can be existing city-owned warehouses or salvage yards, but when this infrastructure does not already exist, cities will have to look elsewhere. Cities may want to consider turning to local nonprofit

organizations for help finding space or to grant opportunities that will provide for the purchase of new, affordable storage areas.

A city could take this opportunity to create new jobs for those responsible for this process. Alternatively, many cities have salvage companies or nonprofits already involved in similar work and could come up with creative ways to bolster those existing entities to try to expand operations to meet the new demand of the deconstruction policy.

4. Implementation

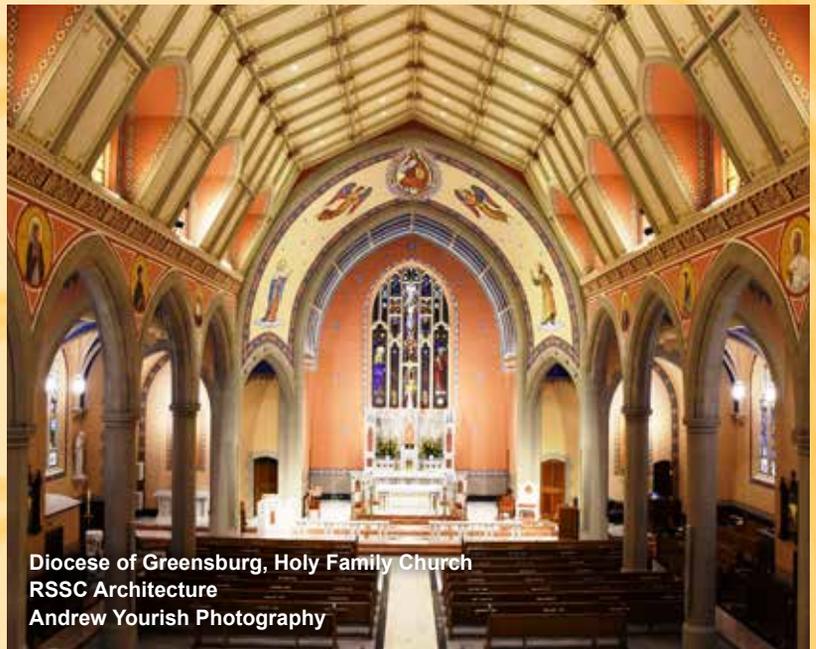
An important aspect of any effective policy is considering the necessary administrative pieces before implementation. In the case of deconstruction, this may include training for city staff on fielding questions from the contractors, effected homeowners, and other members of the public. Understandable and comprehensive paperwork and online resources that educate the public on the benefits of deconstruction will also make for a smoother roll-out. **BG**

This article is a reprint of policy brief originally published on USGBC.org. It was composed by the United States Green Building Council (USGBC), the largest advocacy and education association committed to sustainable and healthy buildings. You can direct questions to: policies@usgbc.org.



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SPOTLIGHT: DECONSTRUCTION POLICY IN PORTLAND, OREGON

In 2016 Portland became the first city in the country with a deconstruction requirement. The City Council unanimously adopted an ordinance, including code language, requiring projects seeking a demolition permit for a house or duplex to fully deconstruct the building if it was constructed in 1916 or earlier, or if the structure is designated as a historic resource.

Those requesting to tear down a building that meets these requirements must submit a completed pre-deconstruction form to Portland's Bureau of Planning and Sustainability as a part of the demolition permit process. Documentation identifying the destination for all materials removed from the structure (excluding concrete) must be submitted to same office no more than thirty days after completion of the deconstruction work.

To help assist with this process, the City provides suggested Deconstruction Resources including free material pickup services and a list of Certified Deconstruction Contractors.

Portland estimates that increased deconstruction will:

- Divert eight million pounds (4,000 tons) of materials for reuse (annually)
- Create job opportunities in the construction industry
- Increase the likelihood of discovering materials containing lead and asbestos and facilitating their safe removal and disposal



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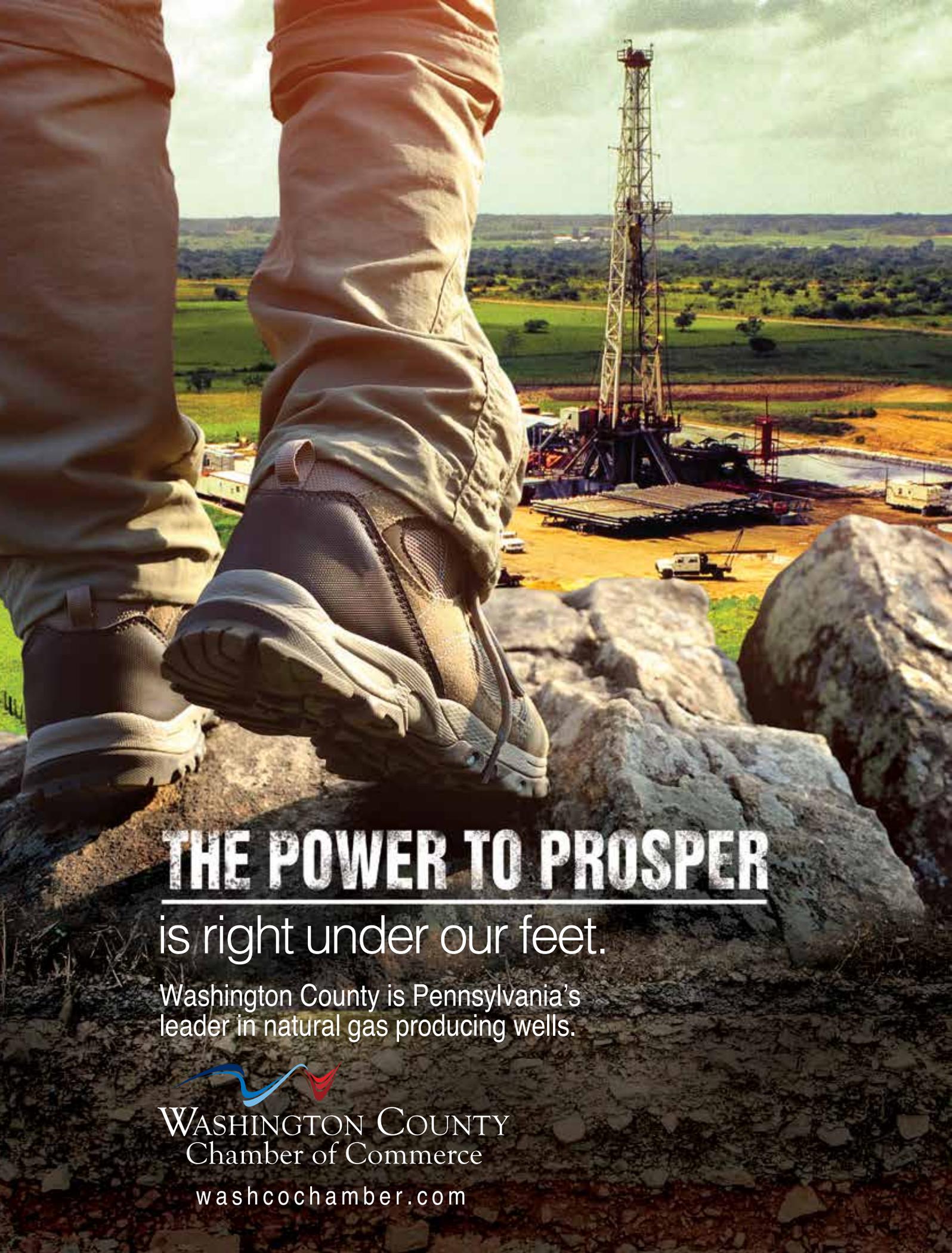
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INDUSTRY & COMMUNITY NEWS



A. Martini & Co. team members (from left) Jake Roberts, Mollie Martini and Katie Stern helped unload food and drink donations from Giant Eagle for the Tour de Cure to fight diabetes.



Mascaro participated in the DVE Rocks Children's Radiothon on September 20. The two-day event raised \$886,825 in support of UPMC Children's Hospital of Pittsburgh.



Mascaro employees participated in the ALS walk held on Saturday, September 14 at Point State Park. As a presenting sponsor, Mascaro is honored to assist the ALS in its mission to discover new treatments and find a cure for this disease.



(From left) PJ Dick's Natasha Smith, Theresa Clancy from Victaulic, and Laura Sesack from McCrossin Foundations spoke at Carnegie Mellon students about careers in design and construction for women.

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Jamie Habberfield from Scalo Solar (left) with Caitlyn Fadgen from the Pittsburgh Downtown Partnership at the Green Building Alliances Emerald Evening, held at Children's Museum Lab.



(From left) Jendoco's Michael Kuhn, Pitt's Aurora Sharrard and Bob Reppe from Carnegie Mellon University.



IKM's Georgia Glass (left) and Grant Scorsone, with Mascaro's Alyssa Kunselman.

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(From left) Tom Kennedy, CJL's Alan Trautman, Steven Massaro, and Janet Kennedy.



(From left) Oxford Development's David Heaton and Lacy Schaefer, Jennifer Pavlik from DLA+, and Plantscape's Kathy Proudfoot at the Rycon Construction Stacks at 3 Crossings site as part of the CREW Pittsburgh property tour.

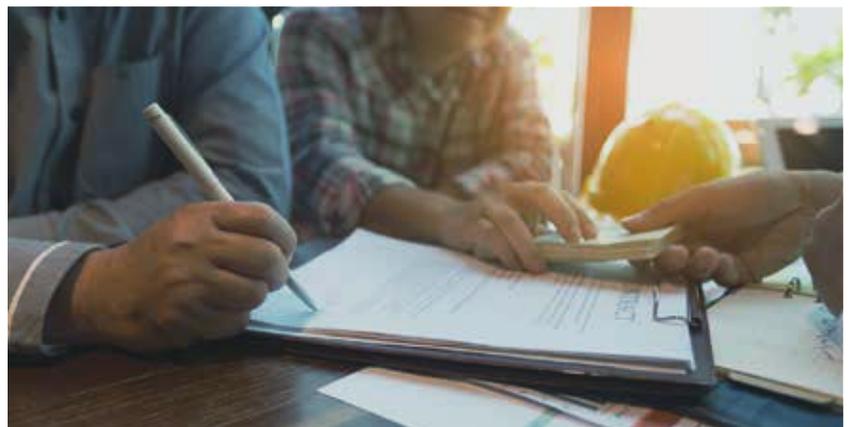


(From left) McCrossin Foundations' Paul Martin, Steve Chiado, and Laura Sesack at the Pennsylvania Builders Exchange (PBX) clay shoot.

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Turner Construction supported ROCK Steelers Style 2019, held at Stage AE on October 4. The event recognizes the funds raised for UPMC Sports Medicine Concussion Program and the Cancer Caring Center. Representing Turner were (back row from left) Steve Mezzacappa, Shawn Bell, Megan Corrie, Abby Krehl, Jodi Rennie, Brian Peglowski, and Tara Connor; (front row) Alex Masters, Rob McLaughlin, and Drew Kerr.



Mascaro's Bill Derence (left) and Mark Dietrick from Case Technologies present the AIA-MBA Joint Committee's Jim Kling Fellowship award to Chuck Parker from Stantec at the AIA Design Awards on October 3. Photo by Jason Cohn.



VEBH's Cassi Renninger and Dan Skrabski, with Beth Cheberenchick from FSS (right) at the AIA Design Awards Gala on October 3.

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(From left) Landau Building Company's Jeffrey Landau, Sharon Landau and Steve Bishop, with Steve Donaldson from CEC.



(From left) Dick Wyatt, PJ Dick's Brett Pitcairn and Jake Ploeger, and Jay Sullivan from St. Catherine Group at the MBA Golf Outing at Laurel Valley.



(From left) Babst Calland's Matt Jameson and Rich Saxe, Dave Meuschke from Burchick Construction, and Jim Miller from Babst Calland.

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(From left) IKM's Jeff Brown, with Gateway Engineering's Tom Turner, Dan Deiseroth and John Schneider.



(From left) Carmen DiLucente and Brian Lorenz from CBRE, Mascaro's Alyssa Kunselman, and CBRE's Tony Rossi.



Mike Monahan from Allegheny Health Network, Turner's Brian Peglowski and Drew Kerr, and Highmark's Todd Rodgers.



Photo by Roy Engelbrecht

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Ray Volpatt Jr. (left) and Tom Stanko from DesignGroup.



(From left) Desmone's Jim Ambrose, Aaron Roach and Luke Lance from Intertek PSI, and Mascaro's Tom Uram.



(From left) Turner's Chris DiLorenzo, Steve Mezzacappa, Shawn Bell, and Tara Connor.





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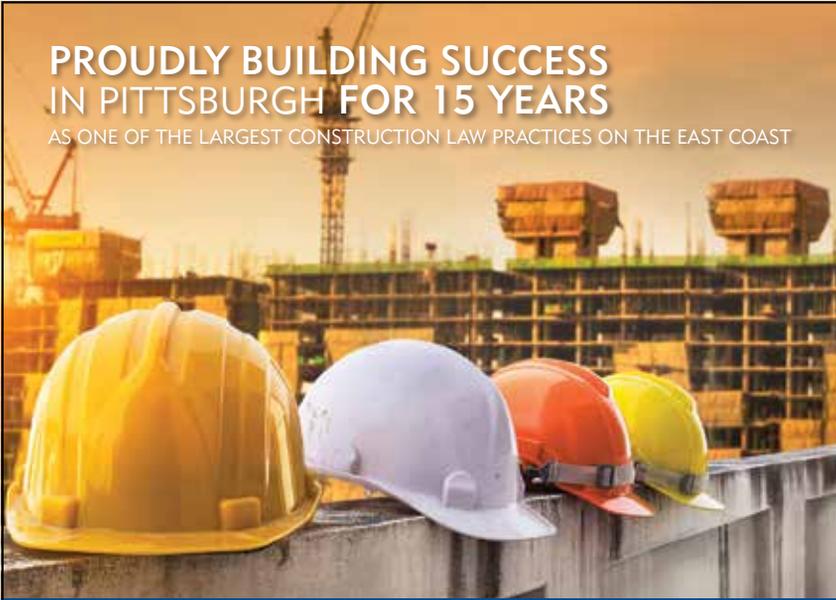


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(From left) Joe Beck, Jack Ramage and Eric Starkowicz from the MBA, and John Andress from Chartwell Investment Partners.



(From left) The MBA's Dave Daquelente, Building Excellence Awards judges Ray Vogel and George Ehringer, and Will Chapman from Philadelphia Insurance.



(From left) Jendoco Real Estate's Bob Lloyd, Jendoco Construction's Domenic Dozzi, Ralph Horgan from CMU, and Dan Then at the Cystic Fibrosis Passion for Wine Gala.



Anthony and Mollie Martini were among the attendees at the 20th annual NAIOP Pittsburgh Night at the Fights.



(From left) Nello's Terry Dunbar, Alex Dick from Dick Building Co., Michael Brodzinski from Lockton, and Millcraft's Chad Wheatley.



Jendoco Construction's Michael Kuhn, Mark Dellana from Genesis Partners, and Norco Painting's Dean Dozzi.

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AWARDS & CONTRACTS

Volpatt Construction was awarded a contract for the addition and renovation of the Mt. Washington Branch of the Carnegie Library of Pittsburgh. The \$2.8 million, 2,500 square foot project was designed by Elagin Architecture.

Carnegie Mellon University selected **Volpatt Construction** as construction manager for its \$3.5 million Mellon Institute Group 1920 Lab Renovations.

Volpatt Construction was awarded a contract for the exterior renovations to the Children's Museum. The architect is Andrea Cochrane Landscape Architecture.

Yarborough Development Inc. was the successful contractor on the \$1 million Brentwood Borough Pool and Bathhouse Renovation. The architect is HHS DR Architects/Engineers.

Rocky Bleier Construction Group was awarded a \$2.18 million contract for the VA Medical Center Pittsburgh Research Building Connecting Bridge. The architect is CannonDesign.

VA Medical Center in Erie awarded **Rocky Bleier Construction Group** two projects, Replace Legacy UPS and the EMPI Emergency Generator 2B. The project costs are \$3.5 million.

Rocky Bleier Construction Group was selected for \$12.2 million in renovations and new construction at the VA Medical Center in Clarksburg, WV. The work includes Site Prep/MRI Upgrade and the new 231-car Parking Garage. Harrell Design is the architect for the 103,326 square foot new structure.

Independence Excavating, Inc. was awarded the Thomas J. Reynolds Award for construction safety and health from The Association of Union Contractors.

Independence Excavating, Inc. is performing the site development work on the 1,235,000 square foot distribution center for TJ Maxx in Lordstown, OH. The site work involves 1.8 million cubic yards of cut-and-fill on 150 acres.

Landau Building Company began the WVU Medicine Emergency Department Expansion project, located at Ruby Memorial Hospital in Morgantown, West Virginia. Construction includes 3 new exam rooms, 2 new triage rooms, and restroom facilities and is expected to finish in November 2019. IKM is the architect of the project.

Landau Building Company is the construction manager for WVU Medicine Dining Room Renovations at Ruby Memorial Hospital in Morgantown, West Virginia. The project includes finish upgrades to the dining room and its corridors as well as improvements to cafeteria wayfinding. Renovations will be completed by the end of 2019. IKM is the architect.

Turner Construction was selected as construction manager for the \$9 million, 35,000 square foot renovations for Google at Bakery Square. Perkins Eastman is the architect.

Mascaro began work for the Allegheny County Airport Authority for the removal and salvage of passenger boarding bridges and reinstallation of bridges on to Concourse B rotundas.

Mascaro received a contract from the University of Pittsburgh to complete tenant fitout for office space on six floors in the newly constructed Murdoch Building in Oakland.

Mascaro began construction of the new Live! Casino Pittsburgh. The new gaming, dining, and entertainment will occupy about 100,000 square feet of former retail space at the Westmoreland Mall.

PJ Dick is providing CM at Risk services for the Penn State Behrend Erie Hall Replacement project. Work will include the demolition of the existing 26,000 square foot Erie Hall as well as the construction a new 65,000 square foot sports and wellness center that will serve as the Behrend Campus' student recreation center, house multiple campus sports teams and include the police service center.

Massaro Corporation was selected a contractor for the \$3.5 million, 8,000 square foot new UPMC New Kensington Wellness Center. Work is scheduled to start in Spring 2020. The architect is Canzian Johnston & Associates.

Massaro/Gilbane was awarded the construction management contract for the \$200 million University of Pittsburgh new central utility plant and Human Performance Center at the Victory Heights campus in Oakland. Burns & McDonnell designed the central plant. The architects for the Human Performance Center are HNTB and WTW Architects.

Highmark awarded a \$1.5 million contract to **Massaro Corp.** for the renovation of the entrance and revolving doors at Fifth Avenue Place. The architect is AE7 Architects.

Massaro Corp. is doing \$3 million in renovations to the Rivers Casino to build out new spaces for the Pittsburgh Martoranos restaurant and Mian restaurant. The Martoranos was designed by Klai Juba Wald Architects. The architect for the Mian was DMac Architects.

Work is in progress by **Rycon's** Building Group on the Dick's Sporting Goods Headquarters Daycare. The \$5 million, 15,000 square foot child care addition is anticipated for completion June 2020.

Rycon's Building Group continues work at West Bay Plaza in West Lake, OH for SITE Centers. Phase 2A is in progress and will wrap up November 2019. To date, Rycon's completed \$16.8 million of work on redeveloping the shopping center.

RIDC awarded **Rycon's** Building Group as the construction manager for Aptiv Autonomous Office at Mill 19B. This \$6.9 million fit-out encompasses 66,000 square foot and is expected to be completed March 2020.

Rycon's Building Group was selected for the \$35 million Magee Hospital Emergency Power Upgrades/Generator Building Addition. The project is anticipated for completion December 2021. RM Creative is the architect.

Rycon's Special Projects Group is currently renovating Direct Energy's offices on the 12th and 13th floors within Liberty

Center. This \$1 million renovation covers 41,000 square feet and is projected to wrap up February 2020.

Work is anticipated for completion in December 2019 on six HCR Manor Care renovations totaling \$2.2 million across three states: FL, MD, & VA. **Rycon's** Special Projects Group is the general contractor responsible and Direct Supply Aptura is the architect.

Rycon's Special Projects Group is completing a major overhaul to FedEx Headquarters' cafeteria. R3A is the architect on the project which aims to be finished November 2019.

Rycon's Special Projects Group was awarded two projects by ELPX Restaurant Group. The fast-food locations include a Raising Canes in Norfolk, VA, and a Panda Express in Ft. Bragg, NC. Both are anticipated to be completed before the end of the year.

Rycon's Special Projects Group is wrapping up work on an office fit-out for Carnegie Mellon University. This 3,500 square foot space is located within the Rand Building and is set for completion November 2019.

Work was completed on an office expansion for Incline Equity. Within the last year, Jones Lang LaSalle selected **Rycon's** Special Projects Group to renovate Incline Equity's office within EQT Plaza.

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Rycon began work on an investment bank office in Pepper Pike, OH. The renovation encompasses 3,800 square feet and is on track for completion December 2019.

Rycon was awarded building three, new Hometown Urgent Care facilities throughout Ohio. The projects total 9,000 square feet and \$1 million. Construction is anticipated for completion by the end of the year.

In Cleveland, OH, **Rycon** is working on multiple renovations for a bank office. Work includes stair, carpeting and wall replacements.

Phases 1 & 2 of the Chelsea Townhomes multi-unit residential development has commenced in Atlanta, GA. **Rycon** is constructing this \$3 million, 22,000 square foot project and will continue until March 2020.

Rycon was awarded a \$1.3 million contract for a Firestone Complete Auto Care facility in Pace, FL. This ground-up project covers over 6,000 square feet and is slated for completion February 2020.

Work on a new Arby's has begun in Tarboro, NC. **Rycon** is building the 2,000 square foot restaurant which is anticipated for completion November 2019.

Rycon was recently awarded three, separate Humana MarketPoint projects totaling \$3 million by Humana.

Two are medical office renovations in Margate, FL, and Philadelphia, PA, while the third is new construction of an office in Miami, FL.

Renovation work is underway by **Rycon** on the 135,000 square foot EL Dorado Furniture store at Kendale Lakes Plaza in Miami, FL. The \$6.8 million project will remain operational during the remodel.

Dick Building Co. has started construction on the adaptive reuse of 2908 Smallman Street into 12 condominiums. The \$7 million renovation will include ground floor commercial space. NEXT Architecture is the project's architect

Nicholson Construction was recently named as the general contractor by Grant County Public Utility District for remedial work on two of their dams, Priest Rapids and Wanapum Dam, outside of Salt Lake City, UT.

PJ Dick will be the construction manager for the new \$20 million natural gas-fired generating plant to be built as part of the Pittsburgh International Airport's microgrid, being developed by Peoples Gas.

Mascaro Construction will be the construction manager for the proposed conversion of the former South Side Hospital into an information technology center for UPMC. **BG**

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FACES & NEW PLACES

Rocky Bleier Construction Group hired **Michael “Mike” Allison** as senior project superintendent. Allison will oversee projects in the Erie corridor.

Rocky Bleier Construction Group hired **Rayni DeFillippo** as project coordinator to assist project management and estimating.

David Koyro was hired by **Rocky Bleier Construction Group** as project superintendent to oversee projects at the VA Medical Center in Oakland.

Turner Construction announced that **Paul Telford** joined its team as a MEP engineer. Paul brings 10-plus years of AEC experience and has a degree in Mechanical Engineering from California Polytechnic State University.

Turner Construction welcomed **Kate Lundy** as a field engineer to its team on September 2. Kate is a recent graduate of the University of Pittsburgh, where she earned a bachelor’s degree in Civil Engineering. Kate interned twice with Turner.

Turner Construction announced the addition of **Min Ma**, a VDC coordinator. Min is a graduate of Texas A&M with a masters in Construction Management. She will assist with BIM/VDC coordination.

Turner Construction welcomed **Mark Fawcett** as a MEP Engineer. Mark has over 10 years of AEC experience.

Turner Construction welcomed **Brian Hershberger** as a MEP superintendent. Brian joins Turner with over 12 years of construction management and superintendent experience.

Kimberly Ridenour joined **Allegheny Construction Group** as director of business development.

Brandon Rupert joined **Mosites Construction Company** in September 2019 as an estimator. Rupert graduated from Penn State University with a degree in Architectural Engineering (Structural Emphasis) and a minor in Architectural Studies.



PJ Dick has hired **Patrick A. Paro** for business development in our Exton office. Patrick has worked in business development roles providing construction management services with a focus on healthcare and higher education. He has a Bachelor of Science in Economics from Bucknell University.

Alfonso Canales joins **Rycon's** Ft. Lauderdale office as an estimator. He brings 24 years' experience to the company.

In **Rycon's** Casework & Millwork Division, **Gina Guevara** has been hired as a drafting/project engineer.

With over five years' experience, **Danielle Harper** has been hired as a human resources coordinator in **Rycon's** Pittsburgh office.

Trisha Kerstetter was added to **Rycon's** Special Projects Group as a project manager. She brings 12 years' experience to the company.

Rycon's Cleveland office welcomes administrative assistant **Jenny Mravec**.

Micah Shaw joins **Rycon's** Ft. Lauderdale as a project manager. He brings 21 years' experience to the team.

Rycon's Building Group welcomes back **Lisa Yuzon** as an experienced administrative assistant.

Recent promotions at **Rycon**: **Brad Ridgeway** as project manager within the Special Project Group and **Chris Lisowski** as engineering manager within the Casework & Millwork Division.

Formerly in **Rycon's** Special Projects Group, project manager **Andrew Redlinger** moved south to join **Rycon's** Atlanta office.

Massaro Corporation announced the following additions to staff: **Angela Donatelli** was hired as project engineer; **Dan Betten** as scheduler; **Damon Prenovitz** as project manager in Erie, PA; **Dan Stitt** returned to Massaro as project manager; and **James Dewitt** joined as superintendent.

Landau Building Company welcomed **Casey Mehall** and **Matt Cramer** as project engineers. Mehall was born and raised in the North Hills. She graduated from Kent State University with a degree in construction management and architectural studies. Cramer graduated from Penn State University with a major in telecommunications and a minor in business. **BG**

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CLOSING OUT

CLOSING OUT BY JACK RAMAGE

“Closing Out” is the perfect heading for the final article of this issue of Breaking Ground magazine. For I am “closing out” my nearly 29-year career as the executive director of the Master Builders’ Association of Western Pennsylvania (MBA) at the end of this year. Had I been asked when I was in high school or even college where my career would take me, the likelihood of managing a construction industry association would have been way down on the list. At that point in my life, I didn’t even know what an “association” was.

But here I am retiring from a vocation, an occupation, call it what you will but it has been anything but a job. The not-for-profit association business does not fit everyone’s career aspirations but when I accepted the position of labor relations director for the AGC of Michigan back in 1986, I knew this was the right career path for me. Negotiating and administering multiple labor contracts annually, resolving contract and jurisdictional disputes and administering construction industry fringe benefit funds was exciting, challenging and at times overwhelming. I had good solid construction (primarily industrial) construction and labor relations experience that allowed me to hit the ground running and be of immediate service to the contractor members of the Michigan AGC.

I was hired as the executive director of the MBA on July 1, 1991 and rest as they say, is history. I was selected for this position primarily for my labor relations experience. The labor climate here in southwestern Pennsylvania has dramatically improved over the last quarter century thus allowing the MBA to devote more resources to other projects and services to enhance the value of association membership. The accomplishments made to the MBA over the years will not be chronicled here except to say that I will carry with me a sense of pride for leaving the MBA in better shape than I found it.

I owe a tremendous debt of gratitude to the great industry leaders who served and are serving on the MBA Board of Directors. From the very beginning, the officers and directors guided me, mentored me and supported me throughout this incredible journey. They allowed me and encouraged me to develop and grow professionally.

My participation in AGC of America, International Foundation of Employee Benefit Plans (IFEFP), and The Association of Union Constructors (TAUC) has afforded me the opportunity to provide a greater depth of service to the MBA members and to enhance my relationships with our local and international union partners. Involvement in national associations and organizations has raised the profile of the MBA to a level of national prominence. Although not a large construction industry

association, the MBA has an impeccable reputation in the areas of safety, labor relations and Taft-Hartley trust fund administration.

But there comes a time in any job or any career when it’s time to move on. Although I have totally enjoyed what I do and the tremendous people I have come to know and become friends with, I too realized it was time to turn the reins over to a younger, smarter and more energetic successor. I have known for some time that I have taken the MBA as far as I could take it. Once I realized that, the decision to retire was easy.

The MBA is poised to be a better association than it is today and to achieve even greater successes. With that backdrop, the MBA Board embarked on a two year mission to find its next chief executive officer. The search committee set into motion a carefully structured search process that resulted in the selection of an individual who epitomizes the qualities of youth, intelligence and innovation. Not only is he smart, young and enthusiastic, Dave Daquelente, the new executive director of the MBA, possesses the knowledge of the industry, the demeanor and the personality necessary to manage the unique challenges of a membership organization especially an association as diverse as the construction industry. I am excited for him, the staff and the membership. I have every confidence in the world that Dave will take the MBA to the next level of greatness.

And finally, I could not end this “Closing Out” piece without acknowledging and thanking the many men and women who I have had the pleasure of working with over the years, the staff members of the MBA. I inherited a staff of talented individuals and as those individuals

retired and moved on, their successors came with new sets of skills but all came with interpersonal qualities so vital to the success of any service organization. To all my co-workers, THANK YOU for making my job look so easy.

And now, in the immortal words of one of my MBA past presidents;

I gotta go.

I love ya.

Good Bye.



Jack W. Ramage has been executive director and board secretary of the Master Builders’ Association since 1991. He retires on December 31, 2019.

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